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Hitachi Dynamic Replicator - Scout Protecting Microsoft Exchange Server

Hitachi Data Systems

MK-98DF8224-00

Table of Contents

Conventions

Keywords, command buttons and other such fields are enclosed in " " while being bold (for example, to denote 

"**Next**" is used)

Inputs for commands and Variables are shown in *Italics*
File names and paths are shown in **bold**
Commands are shown in **`Courier new font`**
Optional keywords and arguments are enclosed within [ ].

 **Notes:**

Contains suggestions or tips.

 **Caution:**

Contains critical information

How this document is designed

Although this document is designed sequentially, you may choose to skip sections that are familiar. This document is divided into five parts.

Part 1 explains protecting and recovering a standalone Exchange server to another standalone Exchange server. Planned failover and unplanned failover are both explained through CX UI and CLI. Failing back a standalone Exchange server concludes part 1.

Part 2 explains about moving storage groups and mailbox in exchange 2k3 and 2k7.

Part 3 explains protecting a two node cluster with one active and one passive node to a standalone DR Exchange server. This part is also applicable when there is only one Exchange Virtual Server (EVS). Planned and unplanned failovers are explained in detail. Failback is explained in the last section.

Part 4 explains Exchange log rotation. This is an optional step that is performed while backing up a production Exchange server to a DR Exchange server

Part 5 is the trouble shooting section for this document which deals with possible errors you may come across and their corresponding workarounds

Please note that Hitachi Dynamic Replicator - Scout does not currently support fabric-based solutions.

1 Introduction to Exchange failover solution

This section explains the process to tackle Exchange server outages by instantly replacing it with a backup exchange server of similar or greater hardware configuration. This process can be referred to as the failover. Failover can be performed under a variety of conditions such as logical corruption or a hardware error or any other situation where the production server is down. Failing over to the backup server is a transparent process to end users and minimizes server downtime. Given below is a picture of a failover process.

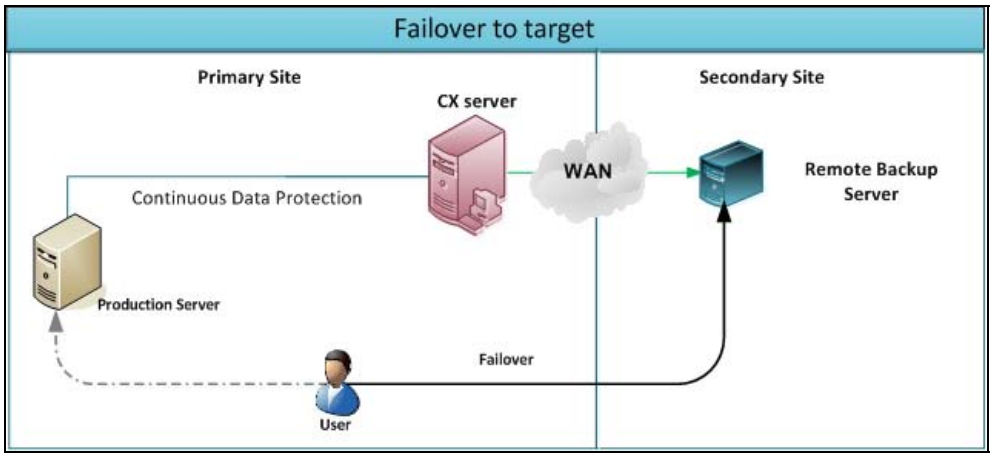


Figure 1:

A failback is initiated when the production exchange server is back online and ready to resume its activities. Depending on the time of outage and data changes, administrators can choose to reverse replicate -- i.e., update the production server with all the data changes (occurred during its outage) from the backup server and then replace the backup server (acting in place of the production server) with the production server.

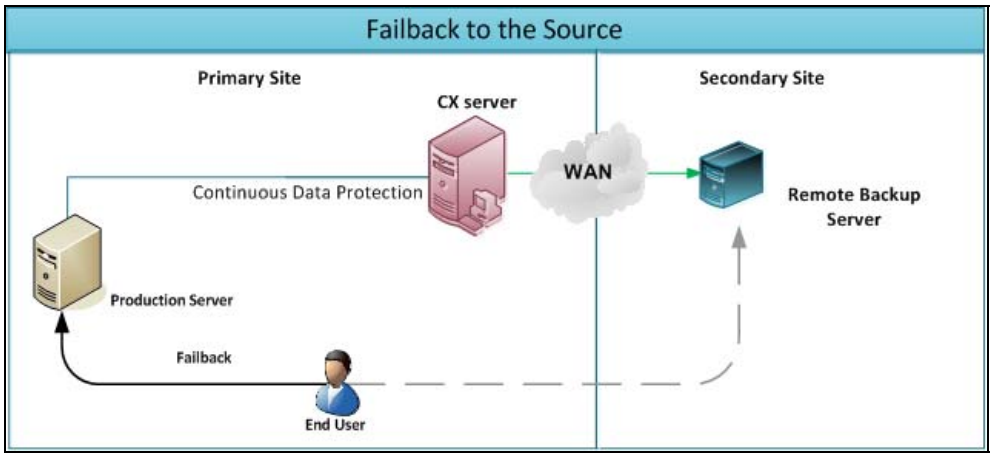


Figure 2:

2 Solution Capabilities

The Solution is capable of:

- Consolidating all backup operations
- Minimize Recovery time objective (time taken to recover from an outage)
- Continuously backup production server(s) thus reducing the delay between Production and backup servers.
- Supporting multiple backup servers (both local and remote).
- Respond to an outage by failing over to a backup server.
- Rolling back the target Exchange server in time to a consistent point.

Given below is a figure representing a single exchange server being backed up to two target exchange servers. These target hosts can be located either locally or a remote site or multiple remote sites.

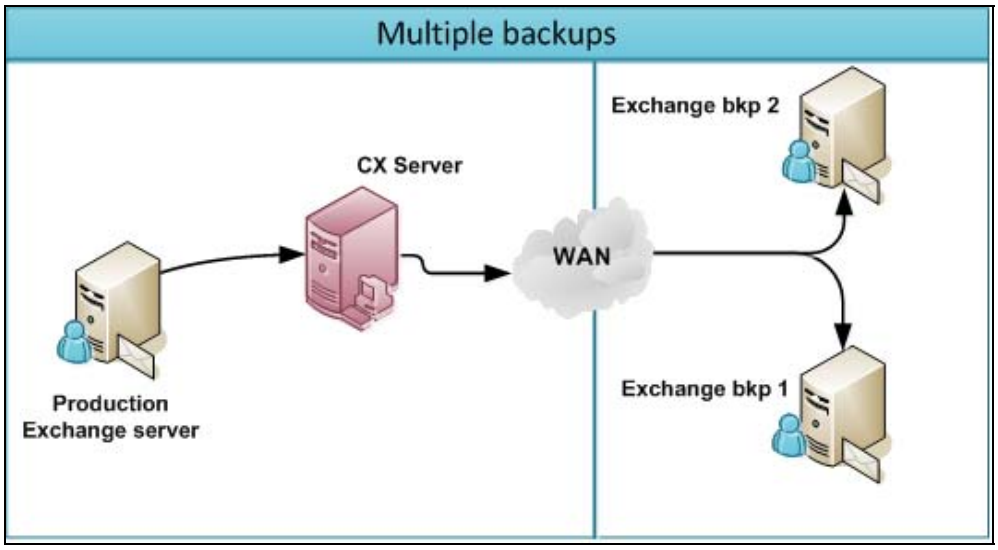


Figure 3

Notes:

Only one of the target hosts can be used for a failover, while the others remain as a backup

3 How this Solution Works

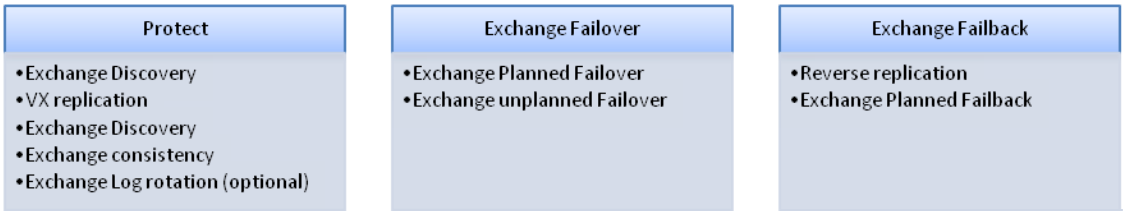


Figure 4

3.1 Protecting Exchange

This section is divided into five sections

Figure 5

Exchange Discovery
The first step for protecting Exchange server is to identify the volumes Exchange server is using. This is accomplished through the Exchange Discovery FX job. By default all Exchange servers in the domain are discovered. You may fine tune Exchange discovery by restricting it to a specific Exchange virtual server or a host.

VX replication
The next step is a VX replication this is where all the discovered Exchange volumes are replicated to a remote DR server.

Exchange discovery again
The Exchange discovery job is run once again to capture all configuration related changes such are replication pairs set, retention path of each replication pair etc. The discovery job is to be run whenever there are Exchange configuration changes.

Exchange consistency
Finally, a consistency job is run on a periodic basis to issue exchange specific consistency tags.

Exchange Log rotation
Although Exchange log rotation is an optional step, this is performed to maintain free space on the production Exchange server. Once the log files are validated at the target, a request is sent to the source Exchange server to remove the validated log files.

Notes:

Discovery job is to be performed every time there is an Exchange configuration change.

3.2 Exchange Failover

There are two types of failovers; the first is a planned failover where the production server is prepared for a failover and then a failover is performed. The second is an unplanned failover where the production server is not considered (assuming that the production server is unreachable). Both types of failovers may be performed either through FX jobs (CX UI) or through CLI

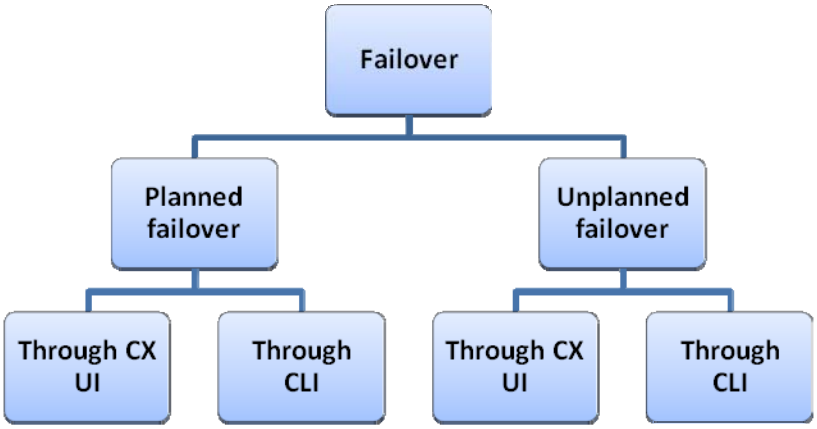


Figure 6

A planned failover is primarily used when the production exchange server and the CX server both are reachable by the DR exchange server. An ideal example is a logical corruption on the production server, DR drills or any planned outages.

An unplanned failover on the other hand is performed when:

- The production server is unreachable and CX server is up and running
- The production server and the CX server are both unreachable

Differences between planned and unplanned failover

Table 1: Differences between unplanned failover and planned failover

	Unplanned failover	Planned failover
When to use	Real-time outages or unexpected outages	Mock drills, To test the setup. Any expected outages
Recovered to	To latest consistent tag common for all Exchange replication pairs	Issues a consistency tag on the Exchange volumes. Target is recovered to the same consistent tag.
Performed through CX UI	Yes, unless the CX is down.	Yes
Performed through CLI	Yes	Yes

3.2.1 Workflow of planned failover

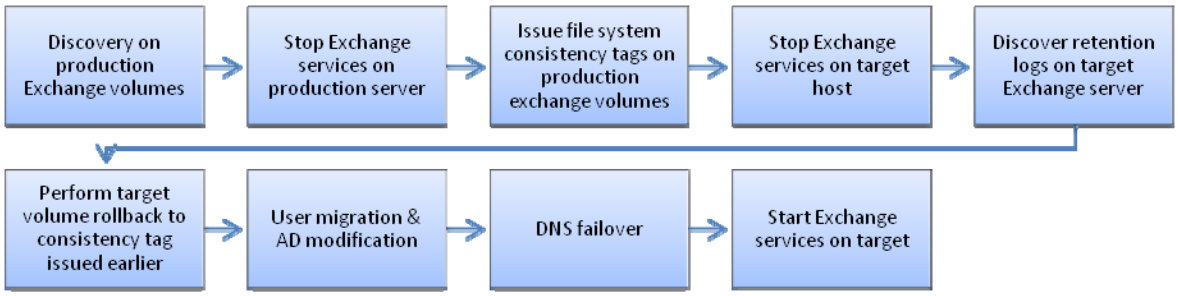


Figure 7:

3.2.2 Workflow of unplanned failover

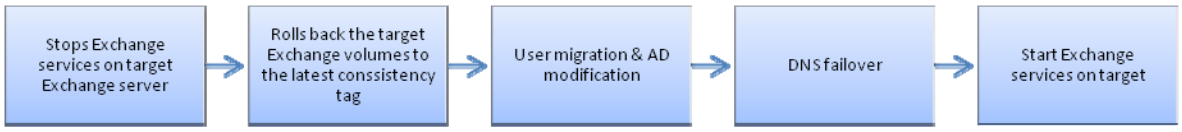


Figure 8

Notes:

At least one Exchange discovery is required (post VX replication) to perform an unplanned Exchange failover

Unplanned Exchange failover will recovery to the last issued consistency tag on the production server.

3.3 Exchange Failback

Exchange failback is performed when the production Exchange server is ready to resume its operations after a failover. Failback is similar to that of a planned failover. The number of steps involved in a failback differs depending on the type of environment.

For standalone source and target Exchange servers:

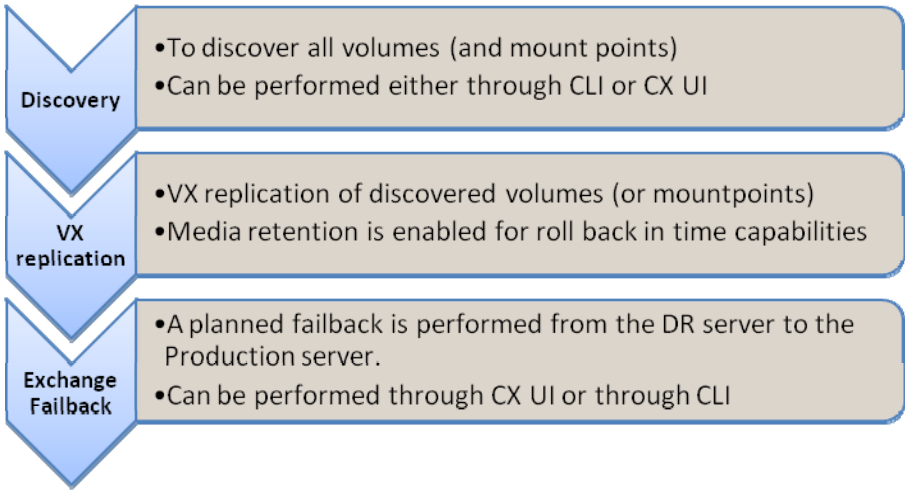


Figure 9

When a clustered target Exchange server is involved, it will be converted into a standalone machine to enable a VX replication. It will be restored to its clustered form after a failback.

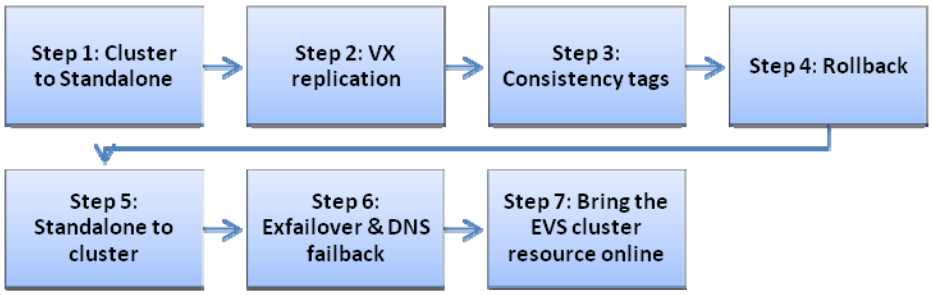


Figure 10

3.4 FX templates involved

Table 2:

Name of the template	Purpose	When is it used	Misc
Exchange 2003/2007= Exchange Discovery	To discover exchange volumes. Discovery can be restricted to a host or even an EVS	Discovery job is performed before setting the replication pairs, after setting up replication pairs and after any Exchange configuration changes.	Exchange Discovery is required to perform an unplanned failover at a later time
Exchange 2003= Exchange Consistency **Exchange 2007= Exchange 2007 Consistency**	To issue consistency markers at regular intervals on the source volumes	After setting VX replication pairs with CDP retention.	At least one consistency tag is required to perform a failover
Exchange 2003= Exchange Planned Failover **Exchange 2007= Exchange 2007 planned failover**	To perform a planned Failover through CX UI	When a planned failover through CX UI is required	
Exchange 2003= Exchange Unplanned Failover **Exchange 2007= Exchange 2007 Unplanned Failover**	To perform an unplanned Failover through CX UI	When an unplanned failover through CX UI is desired	
Exchange 2003 = Exchange planned Failback **Exchange 2007 = Exchange 2007 Planned Failback**	To perform a planned Exchange failback	When a planned failback is attempted through CX UI	
Exchange 2003 = Exchange Failover without Retention **Exchange 2003= Exchange 2007 Failover without Retention**	To perform a failover for replication pairs set without CDP retention		

Exchange 2003= Exchange Consistency Validation **Exchange 2007= Exchange 2007 Consistency Validation**	Used to validate exchange logs	After setting up replication pairs and to check the Exchange logs for possible errors	
Exchange 2003= Exchange Log rotation	Used to remove validated exchange logs	After setting up replication pairs and after consistency validation is completed.	

4 Pre-requisites

- By default, Exchange is installed on the system volume; you will need to move the Exchange DB, Storage group and mailboxes to a non-system volume. Refer to the section Moving Storage Groups and Mailbox Store for exchange 2003 on page 15

- VX and FX agent should be installed on both production and DR servers. Both these VX and FX agents should be pointed to the same CX server to enable CX based failover/failback.

- Ensure that all FX agent service should be configured to start with "domain administrator privileges".

- Domain administrator should be member of local administrators group.

- Ensure that you maintain drive mapping while setting replication pairs (i.e., replicating from D:\ on the production server to the D:\ on the DR server).

- Exchange server should be installed on the DR server with similar settings, directory locations and service packs as on the respective production server.

- After Exchange server 2007 failover, storage groups may not mount if LCR is enabled at source Exchange server.

- Failover of Exchange 2007 is not supported if CCR is configured

- Disable the option "**Register this connection's addresses in DNS**" for all network connections on the production Exchange server.

- Login as a domain administrator to perform any CLI operation .

- Automated Exchange failover with Nested mount points is not supported

- Ensure that you do not name the production server with any of the following.

1. <Names of mail stores>,
2. <Storage Group Name> ,
3. InformationStore ,
4. <Organization Name>,
5. Administrative ,
6. Groups,
7. Microsoft
8. Exchange,
9. Services,
10. Configuration

Else the failover will exit with an error code of 32.

- Ensure that a separate volume with sufficient space is available for CDP retention log files

- On clustered production servers you will need to set the registry value "**UseConfiguredIP**" to decimal 3255. Another registry value "**ConfiguredIP**" should be set to the public IP address, since the private IP address will be internally used for clustering. Both registry values are under "**HKEY_LOCAL_MACHINE\SOFTWARE\SV Systems\FileReplicationAgent**"

- Configure all the FX jobs such as discovery, consistency, failover, failback within the same job group on the CX-UI.

- Exchange server installation binaries should not be present on the source or target volumes.

4.1 Moving Storage Groups and Mailbox Store for exchange 2003

This section describes about how to move both mailbox as well as storage groups in exchange windows 2003 from one drive to another drive. Steps are given below about how to proceed. First storage group is moved first, mailbox, and then public storage group.

Figure 11:

4.1.1 Moving Storage Group

Step 1. Access the production Exchange server and navigate through "**Start->Programs->Microsoft Exchange -> System Manager**".

Figure 12:

Step 2. This should open the "**Exchange System Manager**". Expand "**Administrative Groups**" and then expand "**Servers**".

Figure 13:

Step 3. All the exchange servers within the domain will appear under the server. Then expand the production exchange server, and select **"First Storage Group".**

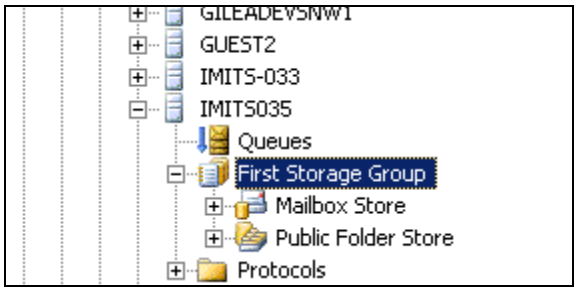


Figure 14:

Step 4. Right click on the "**First Storage Group**" and click on "**Properties**".

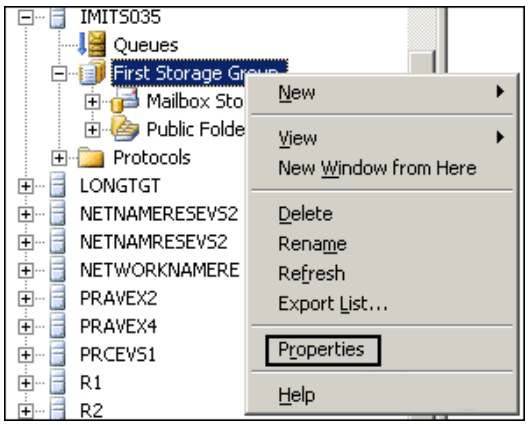


Figure 15:

Step 5. You should now see the **"First Storage Group properties"** screen. To change the Transaction log location click on the browse button corresponding to it.

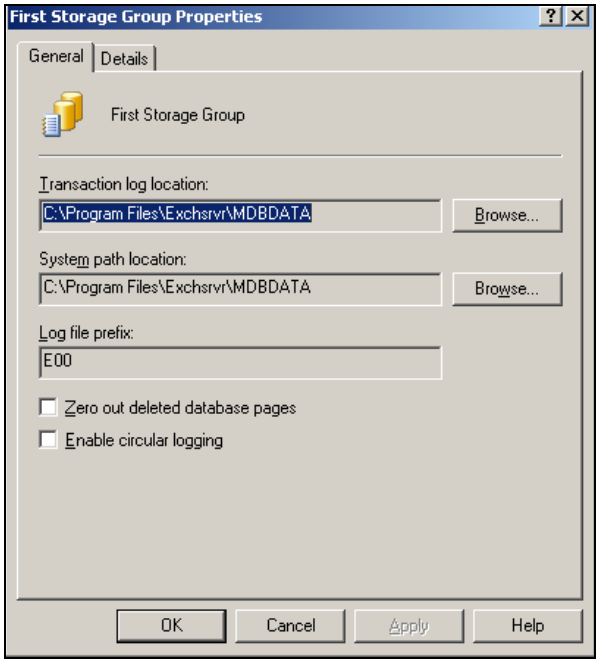


Figure 16:

Step 6. You may create or select a new location for the transaction logs then click on **"OK".**

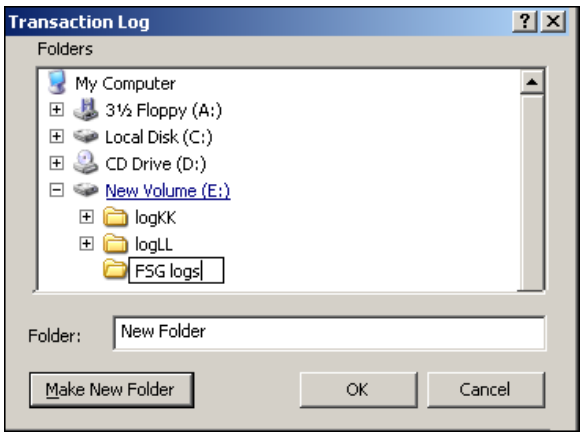


Figure 17:

Step 7. Repeat previous steps to change the **"System Path Location"** then click on **"Apply".**

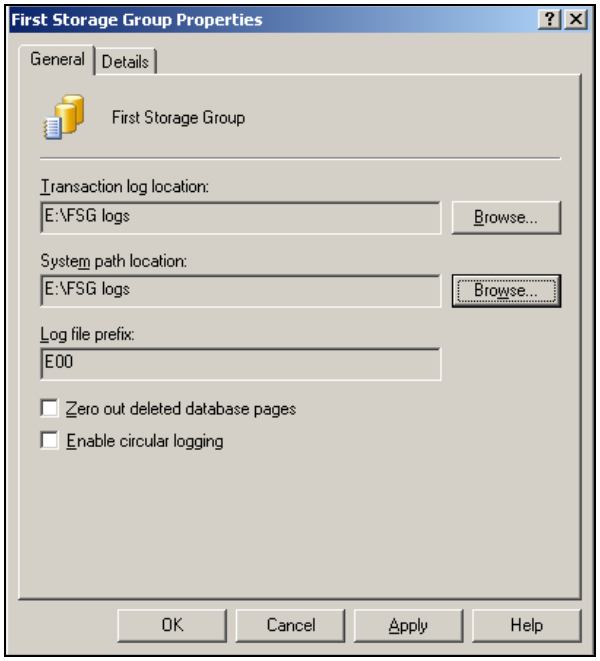


Figure 18:

Step 8. A confirmation message box appears. Click on **"Yes"** to proceed or **"No"** to cancel and go back.

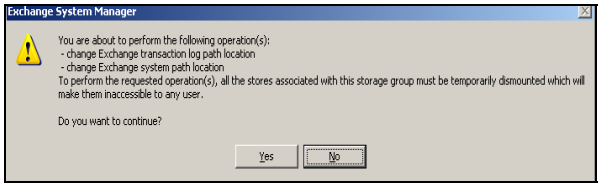


Figure 19:

Step 9. A progress bar appears indicating that the transaction logs are being moved.

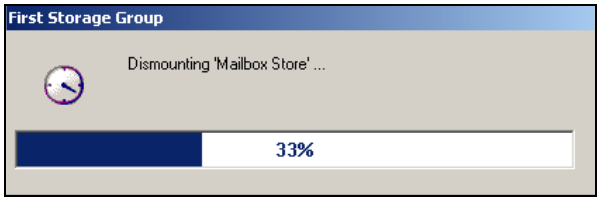


Figure 20:

Step 10.A message box appears indicating that the logs are moved successfully. Click on **"OK"** to continue.

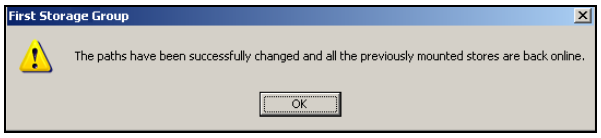


Figure 21:

4.1.2 Moving Mailbox Store

Step 1. On the Exchange system manager, select the production server and then expand **"First Storage Group"** to select the **"Mailbox Store"**.

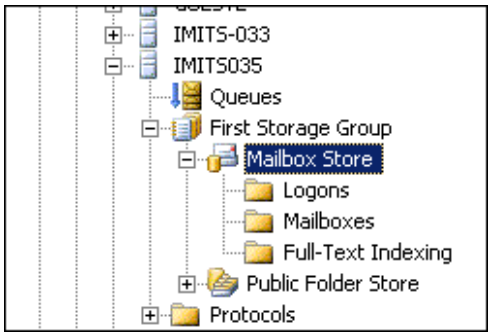


Figure 22:

Step 2. Right click on the **"Mailbox Store"** and click on the **"Properties"**.

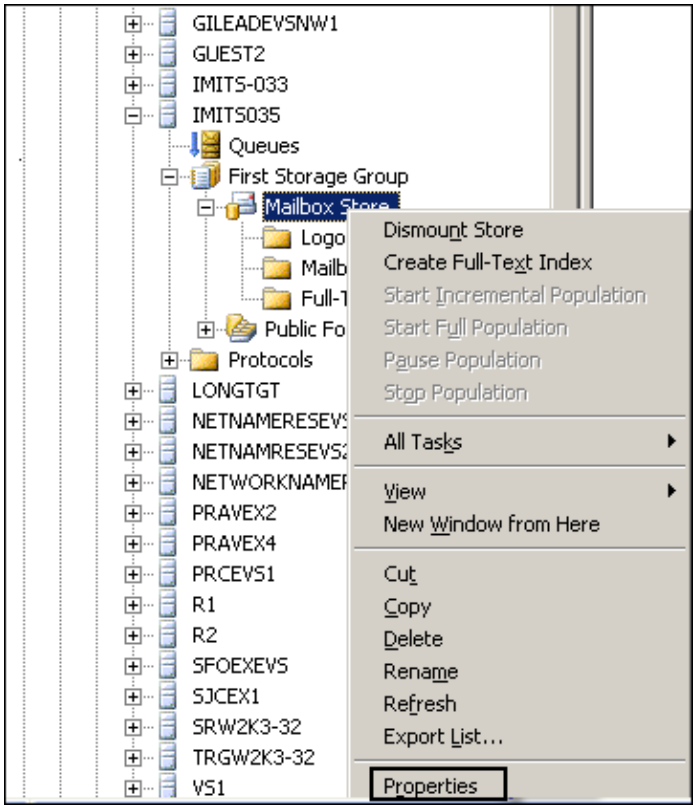


Figure 23:

Step 3. You should now see the **"Mailbox Store Properties"** screen. To change the **"Exchange Database"** path click on **"Browse Button"** corresponding to it.

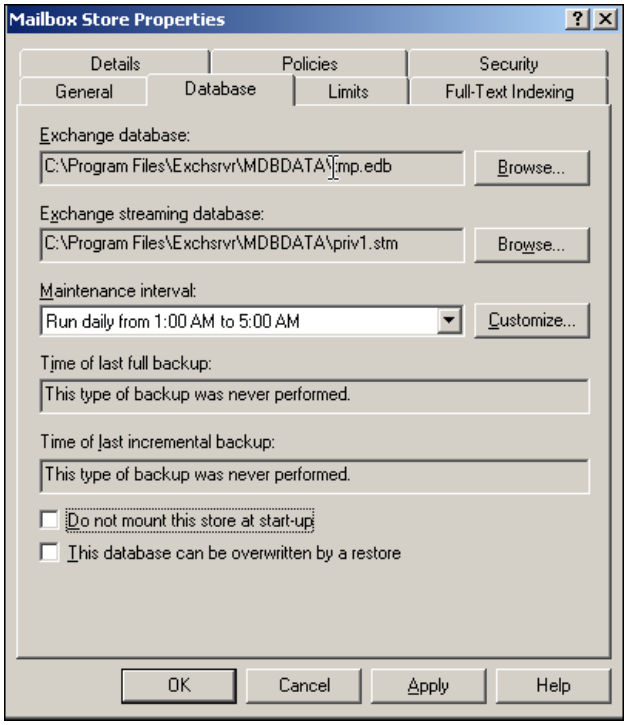


Figure 24:

Step 4. You may create or select the drive where you want to save and click on "**Save"** button.

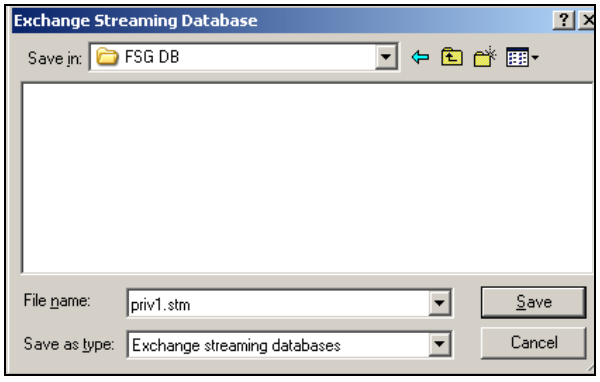


Figure 25:

Step 5. Repeat the previous steps for **"Exchange Streaming Database"** and then click on **"Apply".**

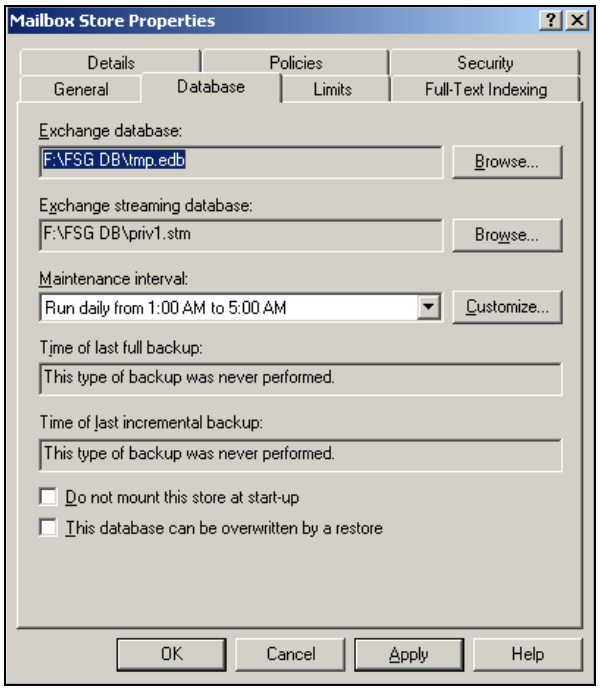


Figure 26:

Step 6. A confirmation message box appears. Click on **"Yes"** to proceed or **"No"** to cancel and go back.

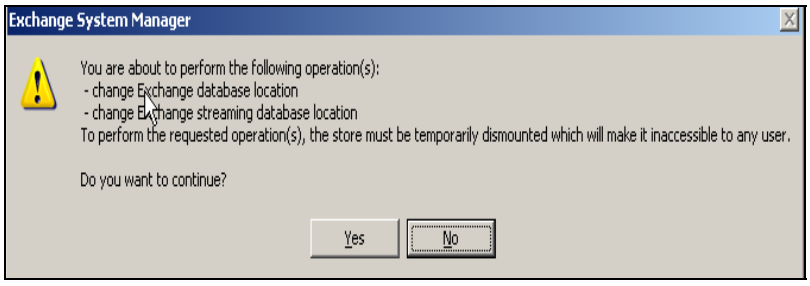


Figure 27:

Step 7. A progress bar appears indicating that the **"Mailbox"** is being moved.

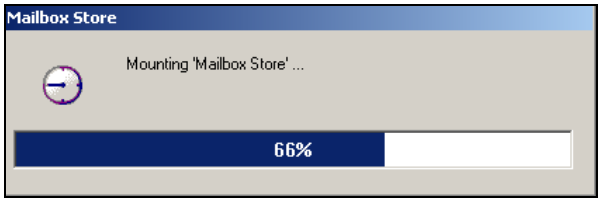


Figure 28:

Step 8. A message pops up. Click on **"OK".**

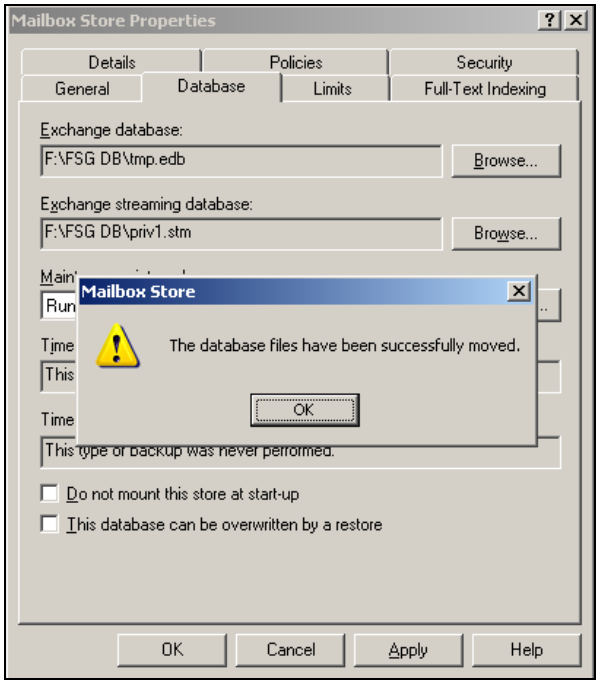


Figure 29:

4.1.3 Moving Public Folder Store

Step 9. All the exchange servers within the domain appear under the server. Then, expand the production exchange server, and then select **"Public Folder Store"**.

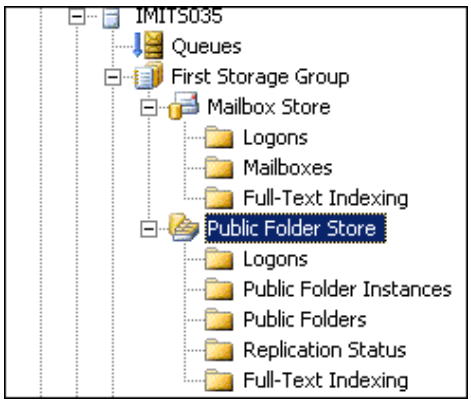


Figure 30:

Step 10. Right click on the **"Public Folder Store"** and click on the **"Properties".**

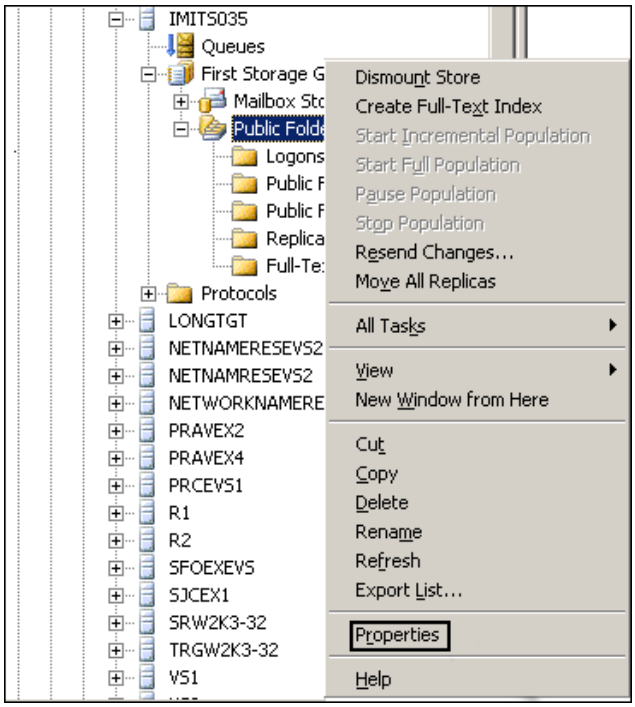


Figure 31:

Step 11. You should now see the **"Public Folder Store Properties"** screen. Select on **"Database Tab"**. To change the **"Exchange Database"** location click on **"Browse"**.

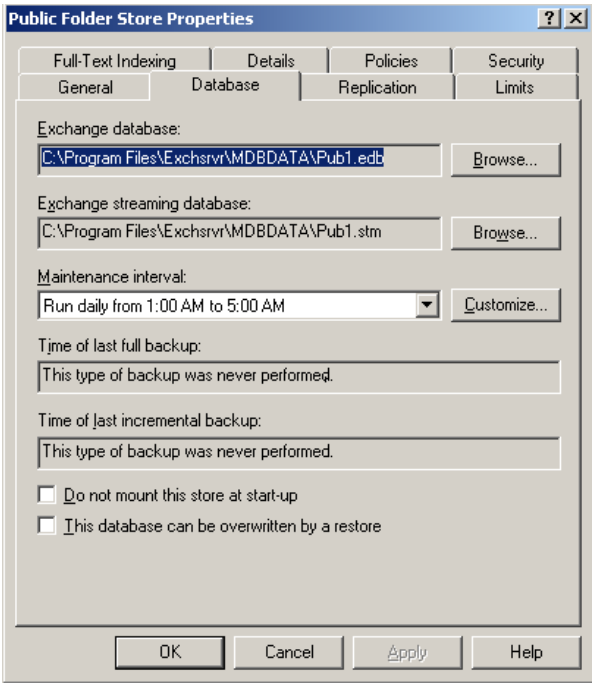


Figure 32:

Step 12. You may create or select the new location where you want to store it. Click on **"Save".**

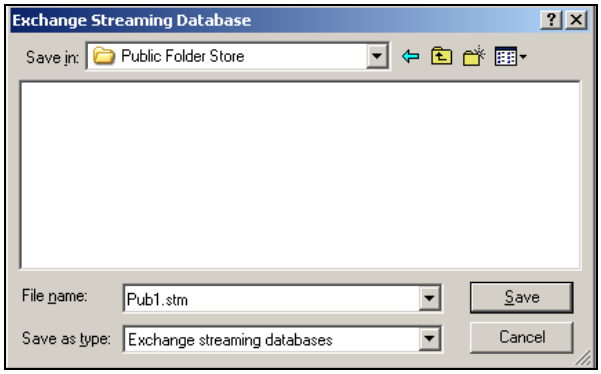


Figure 33:

Step 13. Repeat the above steps **"Exchange Streaming Database"**. Then, click on **"Apply".**

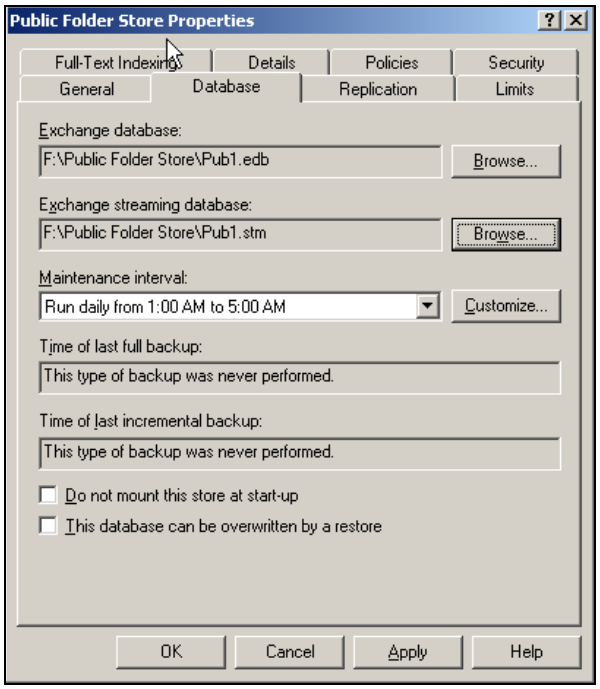


Figure 34:

Step 14.A confirmation message box appears. Click on **"Yes"** to continue or click on **"No"** to cancel and go back**.**

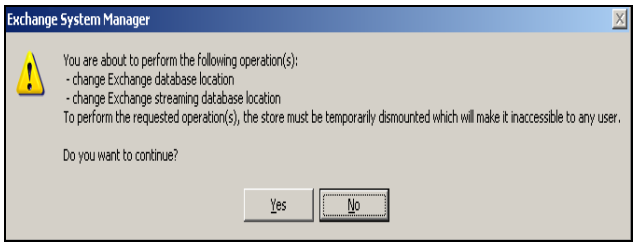


Figure 35:

Step 15.A message box appears indicating that the database files are successfully moved. Click on **"OK"**.

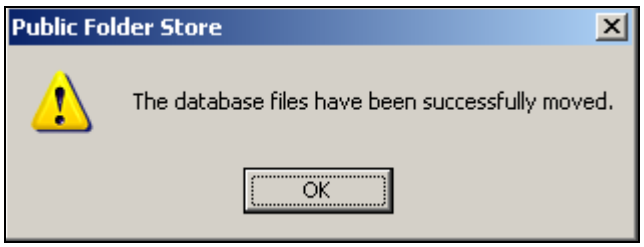


Figure 36:

Step 16. You should now see the "**Public Folder Store Properties**" screen indicating the new paths for "**Exchange Databases**" and "**Exchange Streaming Database**". Click on "**OK**."

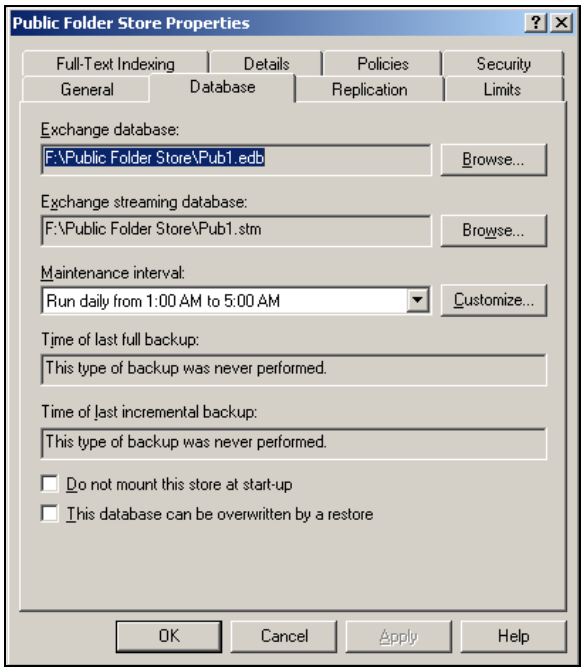


Figure 37:

4.2 Procedure for Exchange 2007

This section explains about how to move both mailbox and storage groups from the system drive (For example C:\) to any other drive. Steps given below are given below about how to proceed. Logs are moved first followed by the mailbox and database.

Figure 38

4.2.1 Moving the Logs

Step 17. Access the production Exchange server and then navigate through "**Start->Programs->Microsoft Exchange Server 2007->Exchange Management Console**".

Figure 39:

Step 18. You should now see the **"Exchange Management Console"** screen. Expand the "**server configuration"** to click on the "**mailbox".**

Step 19. Select the mailbox to be moved. In this example, we move the mailbox named **"Exprod"**.

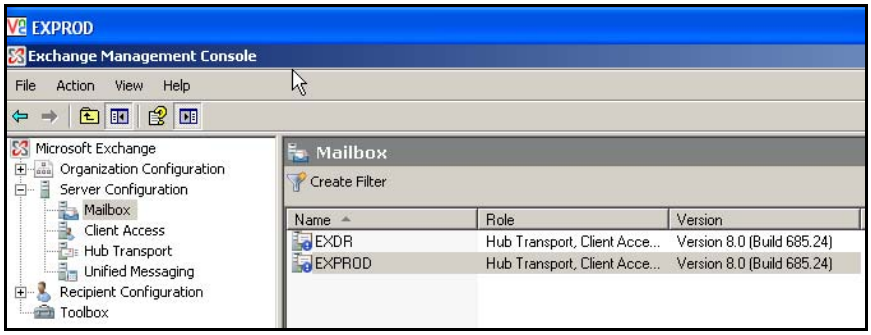


Figure 40

Step 20. All the exchange servers within the domain will appear under the server. Expand **"First Storage Group"** of **"Exchange Management Console"**. Right click and click on **"Move Storage Group Path"**.

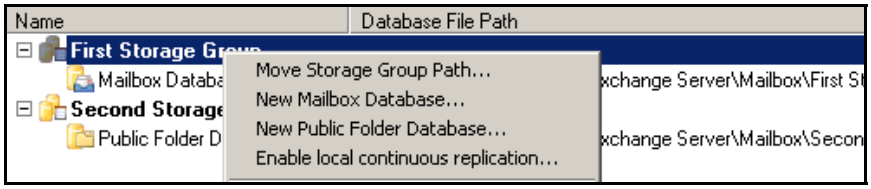


Figure 41:

Step 21. You should now see the **"Storage Group Name"** screen. To change the **"Log Files Path"** location click on the **"Browse"** corresponding to it.

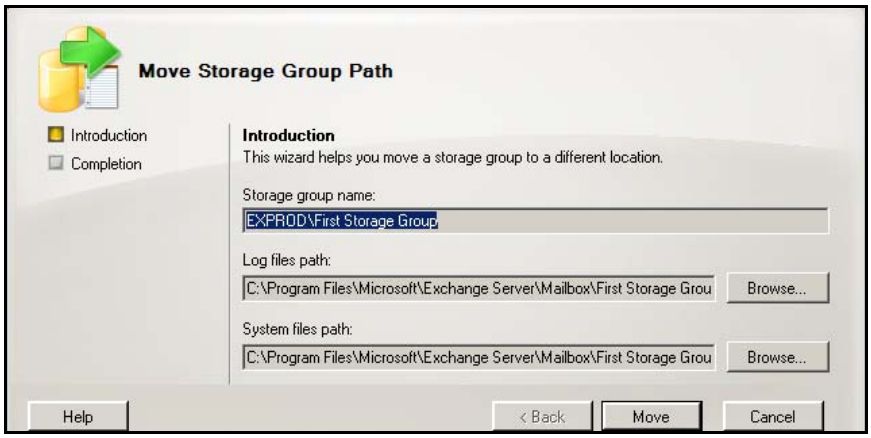


Figure 42:

Step 22. You may create or select new location to move the folder. Click on **"OK"**.

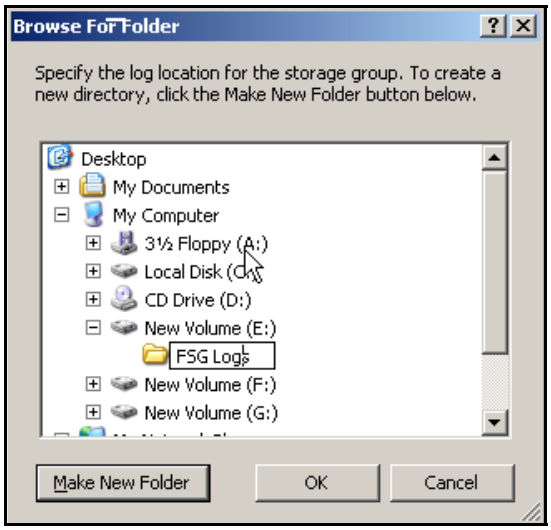


Figure 43:

Step 23. You should now see the **"Mail Storage Group Path"** screen. You can observer a progress bar next to **"First Storage Group"** indicating that the logs are being moved.

Figure 44:

Step 24.A confirmation message box appears. Click on **"Yes"** to continue or **"No"** to cancel and go back.

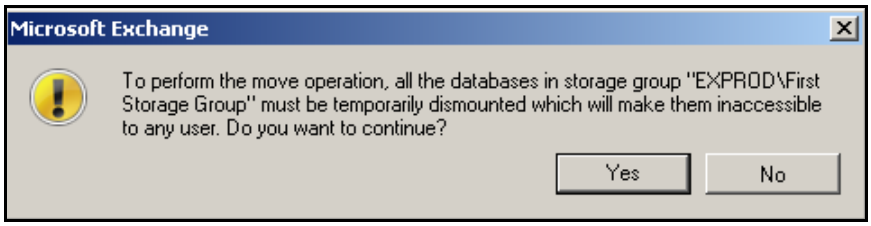


Figure 45:

Step 25. Click on **"Finish"** button.

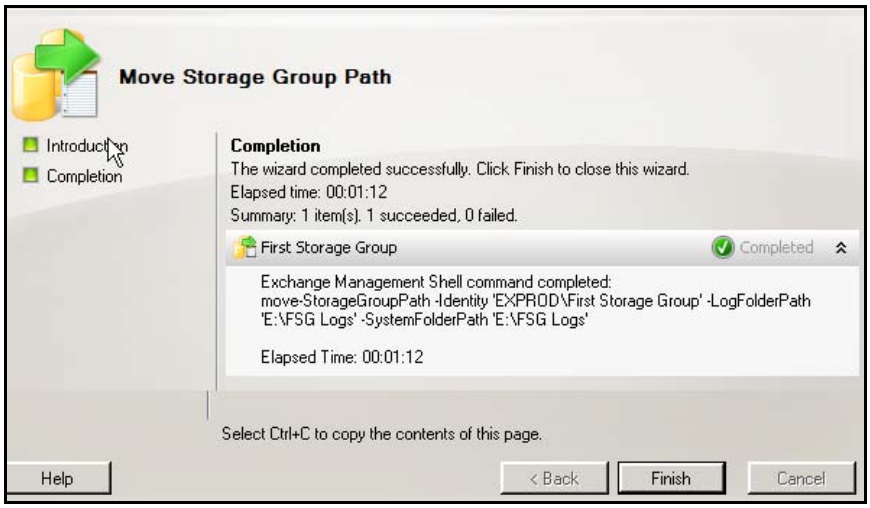


Figure 46:

4.2.2 Moving Private Store

Step 26. All the exchange servers within the domain will appear under the server. Expand **"Mailbox Database"** of **"Exchange Management Console".**

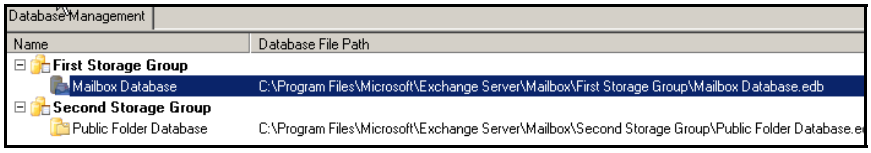


Figure 47:

Step 27. Right click on the "**Mailbox Database**" and click on "**Move Database Path**".

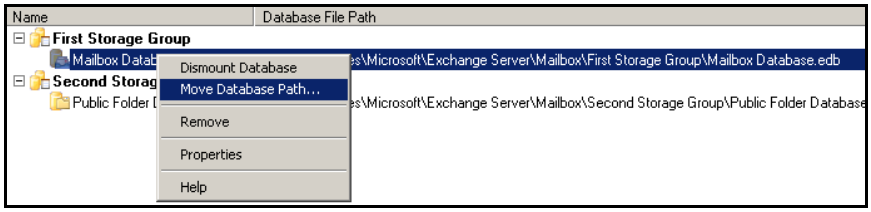


Figure 48:

Step 28. You should now see the **"Move Database Path"** screen. To change the **"Database File Path"** location click on **"Browse"**.

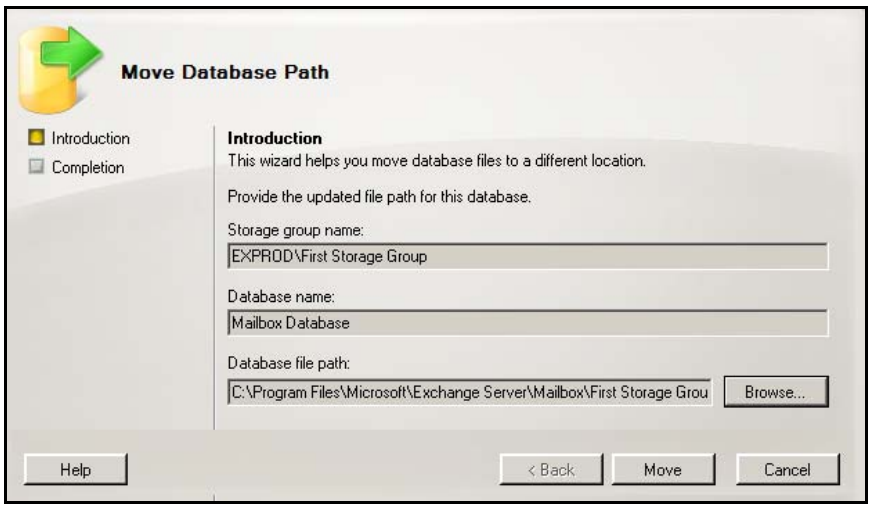


Figure 49:

Step 29. You may create or select a new location to save. Click on **"Save"**.

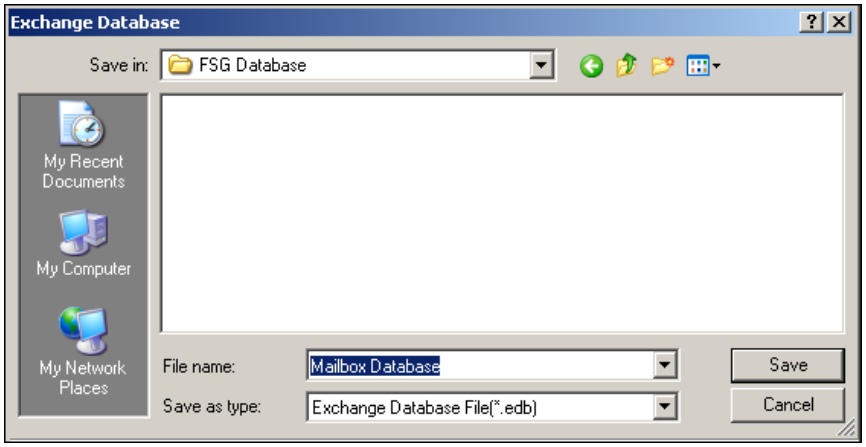


Figure 50:

Step 30. You should now see the **"Move Database Path"** screen indicating that **"Private Store"** is moved. Select on **"Finish".**

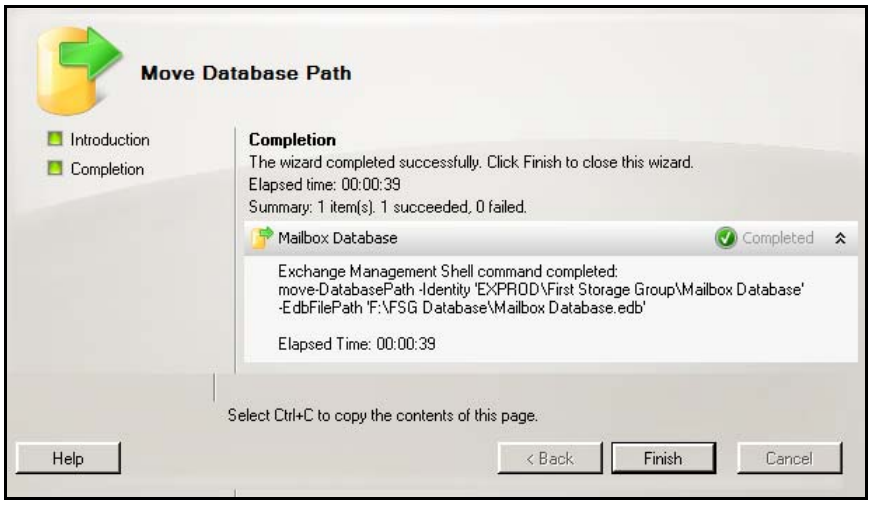


Figure 51:

4.2.3 Moving the Public Store

Step 31. Select **"Public Folder Database"** under **"Second Storage Group"** of Database Management under **"Exchange Management Console"**. Right click and select move the database file path.

Figure 52:

Step 32. You should see **"Move Database Path"** screen. To change **"Storage Group Path"** location click on **"Browse"**.

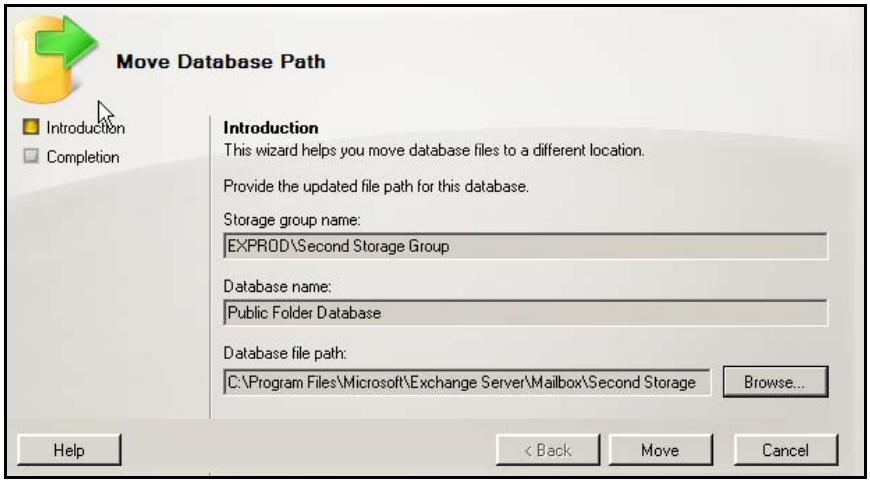


Figure 53:

Step 33. You may create or select to move and then create a new folder **"FSG Logs"**. Click on **"Save"**.

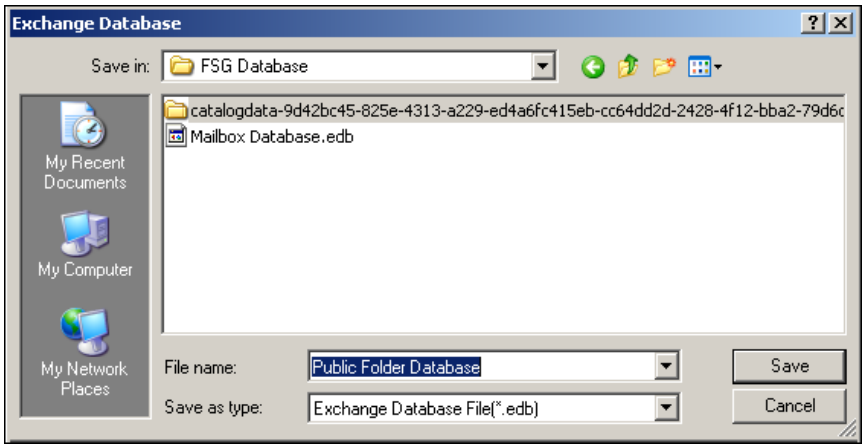


Figure 54:

Step 34. Click on **"Move"**.

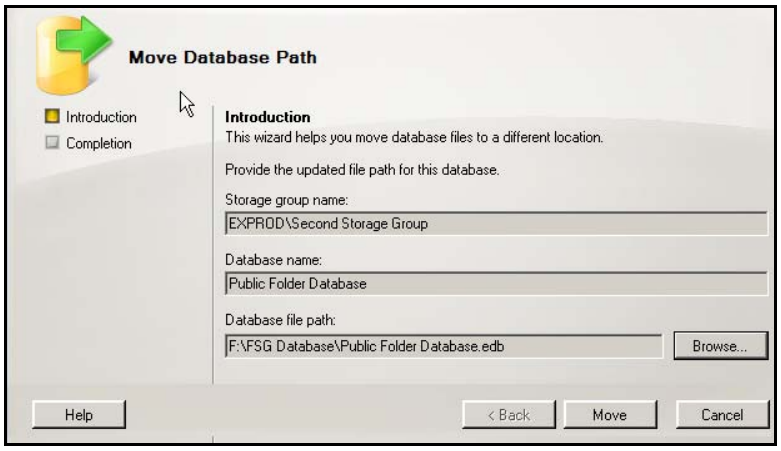


Figure 55:

Step 35. You should now see **"Move Database Path"** screen. Click on **"Finish".**

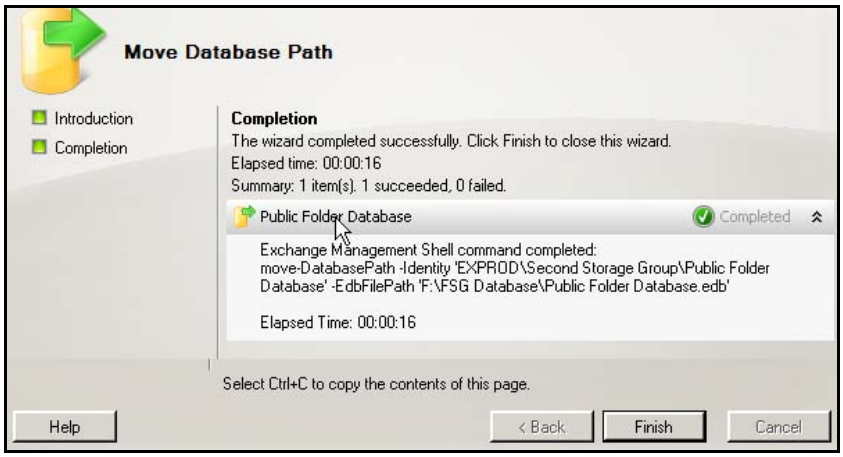


Figure 56:

Step 36. A message box appears indicating Databases are being moved. Click on **"Yes"** to continue or **"No"** to cancel and go back. Click on **"Finish".**

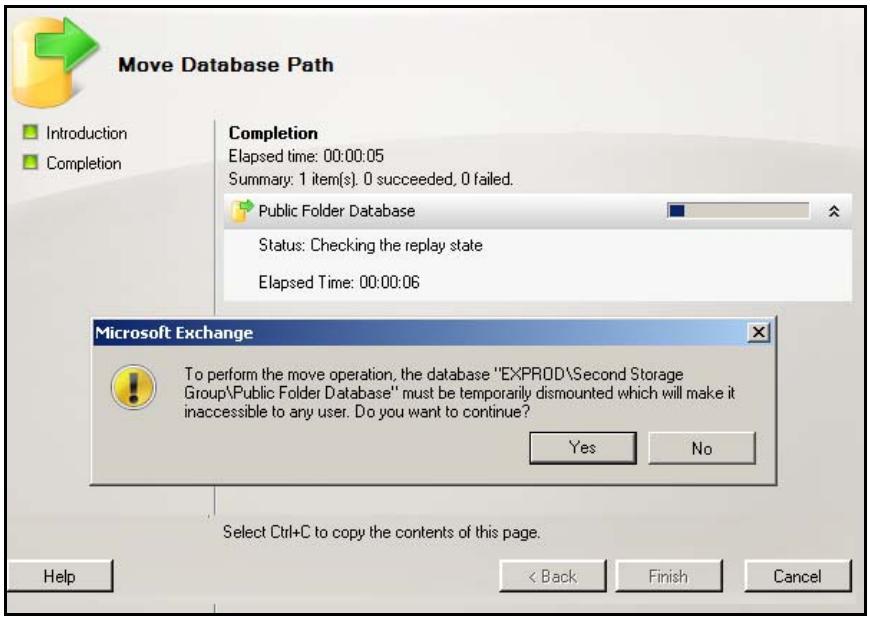


Figure 57:

4.3 Dependent services

For Exchange Server, Scout does not start or stop all the dependent services automatically during failover or failback operation. By default, For Exchange 2007 it starts and stops "**Exchange Information Store**" and "**Exchange System attendant**" services and for Exchange 2003, by default it starts and stops "**Exchange Information Store**", and "**Exchange System attendant**", "**Exchange MTA**", "**Exchange Management**" and "**Exchange routing engine**" services. To start and stop other dependent services during failover and failback operation, use Failoverservices.conf file. The "**failoverservices.conf**" file is located under the "**consistency**" folder (under VX installation path).

To stop and start the dependent services, create a section [Exchange] in failoverServices.conf file in not already present. In the section, add two keys START and STOP. Write services name that should be started in START key separated by comma and write services that should be stopped in STOP key. The service name should NOT be placed in double quotes even if there is any space in the service name. Services name must be listed in the proper order. Scout starts services from right to left & stops services from left to right. Scout stops all the listed dependent services before stopping default Exchange services and starts all the listed dependent services after starting default Exchange services. This ensures that these services are stopped and started while performing failover.

Format of the section appears as below.
[Exchange]
START=<ServiceName1>,<ServiceName2>,….
STOP=<ServiceName1>,<ServiceName2>,….

Example,

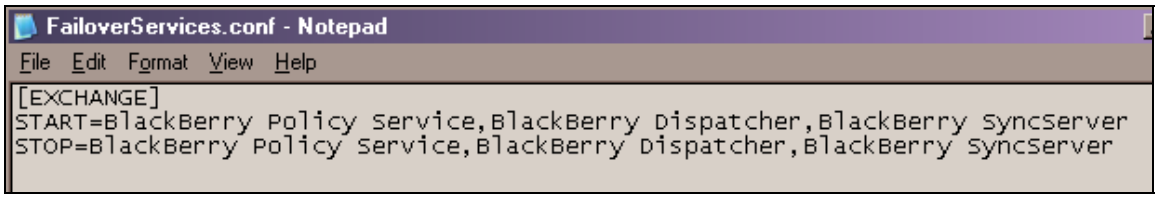


Figure 58

Notes:

If dependent services of the Exchange Server are running and those are not listed in failoverservices.conf file, then default Exchange services cannot be stopped..

4.4 Adding DR Exchange server to SMTP connector

Access the Exchange System manager then navigate to "**Administrative Groups -> First Administrative Group -> Routing Groups -> First Routing Group -> Connectors**" and right click on the desired connector and select "**Properties**"

Click on the General tab then add the DR Exchange server as a member of this connector.

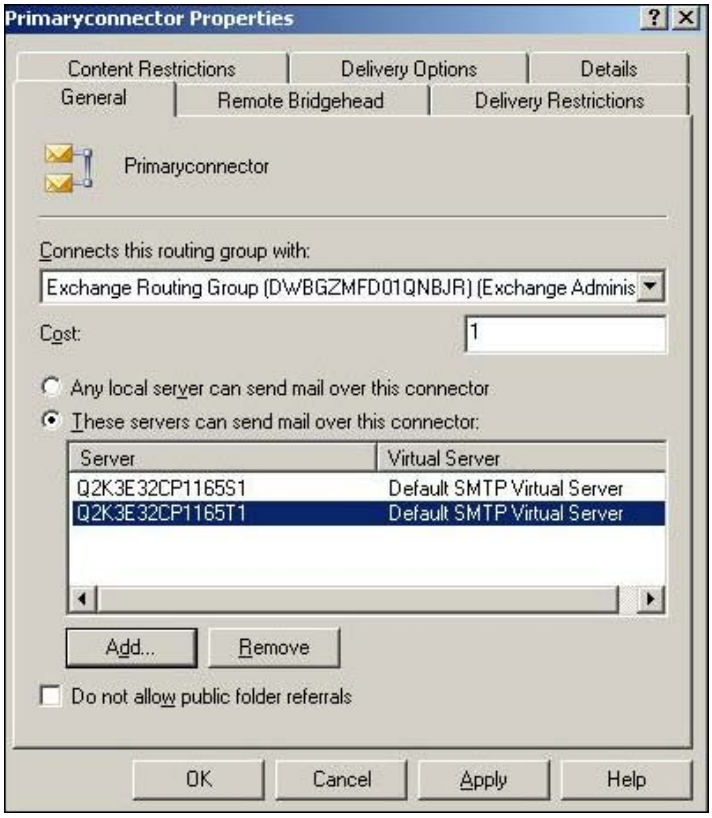


Figure 59

Doing this will ensure that the emails will pass through the same SMTP connector even after failover

4.5 Creating special user for Exchange solution

The table below shows the required privileges in different phases of the Exchange solution

Operations	MS Exchange Server
Consistency	Create a domain user account to be used as service account Set "Log on as a Service" permission to the service account Service account should be assigned appropriate permissions to the service account User Object Service account should be added to the Local Administrators Group on both the Master and Replica servers because, For snapshot operation, VSS requires local administrator privileges
Discovery	Service account should be added to the Local Administrators Group on both the Master and Replica servers because, Get root volume/mount point corresponding to each database/log file path Service account should be given full control of the source/target MS Exchange server objects (Under configuration tree) at Active directory because, During discovery, application.exe queries the Exchange server objects at active directory for database/log file paths
Failover (Planned/Unplanned)	Service account should be given full control of all CN=Users (and/or any Exchange user objects) Required for user migration Service account should be given full control of all CN= CN=Microsoft Exchange System Objects To handle System mailbox objects Service account should be given full control of source/target computer objects under CN=Computers (under Domain tree) To update service principal name attributes of source/target

	DNS Failover/Failback requires update/modify permissions over source server's DNS record (A record) During failover, the source's A record has to be updated with target's IP address such that redirection is possible after failover. During failback, the source's A record has to be restored to the original IP address of source server
AD replication/ DNS update	Add service account to built-in administrators group of each domain controller

Introduction

This chapter describes about the necessary privileges for the exchange failover and failback. It also describes the granular permissions required to allow the InMage service to successfully perform an exchange failover and failback. To set privileges you need to create domain user first then full control over the DNS for each source and target.

The processes involved in this document are:

- Create a Domain User
- Add this user to Production Server and DR Server record in DNS Server management console
- Add this user to Production Server and DR Server in Active Directory using ADSI Edit and give full permission.
- Add this user to the Microsoft exchange under services of configuration tree.

Notes:

You need a domain administrator for following the steps given below.

Detailed procedure to set privileges is as follows.

Create a Domain User

Step 37. Log on to the domain controller as an administrator where Production Server and DR Server are part of the domain.

Step 38. Click on "**Start->Programs->Administrative Tools ->Active Directory Users and Computers**".

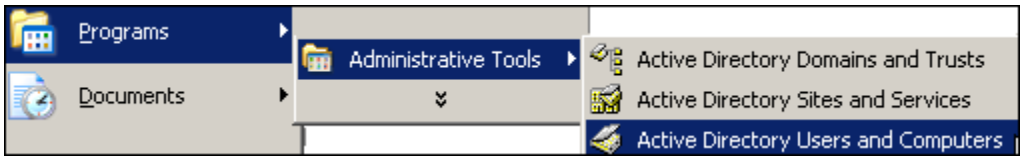


Figure 60

Step 39. You should be able to see "**Active Directory Users and Computers"** screen. Under "**Active Directory Users and Computers",** select **"Users",** a list of users appears on the right hand side, right click, and select **"New->User"**.

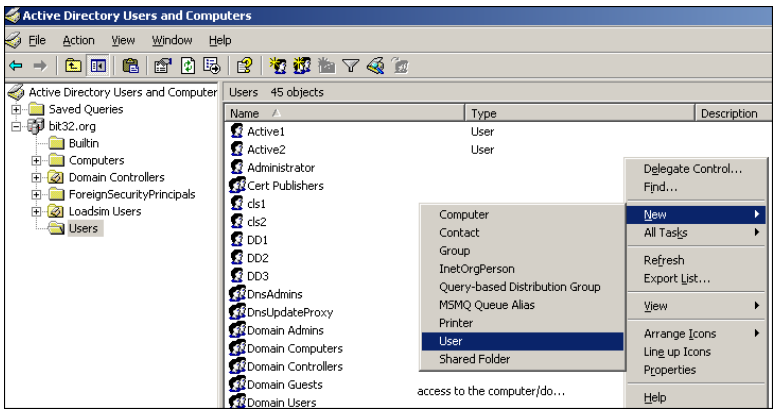


Figure 61:

Step 40. You should be able to see **"New Object-User"** screen. Enter the **"Name"** and **"User Logon Name"** and click on **"Next"**. In this example, first name and user logon name as "**InMageUser**" is used.

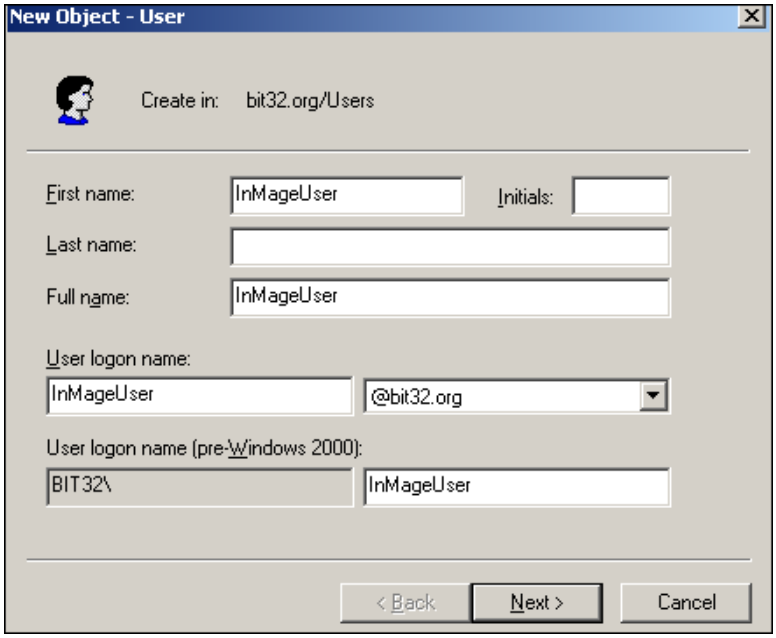


Figure 62:

Step 41. Enter the **"Password"** and select **"Password Never Expires"**. You will get a message indicating that you will not be required to change the password at next logon, click **"OK",** and click **"Next"**.

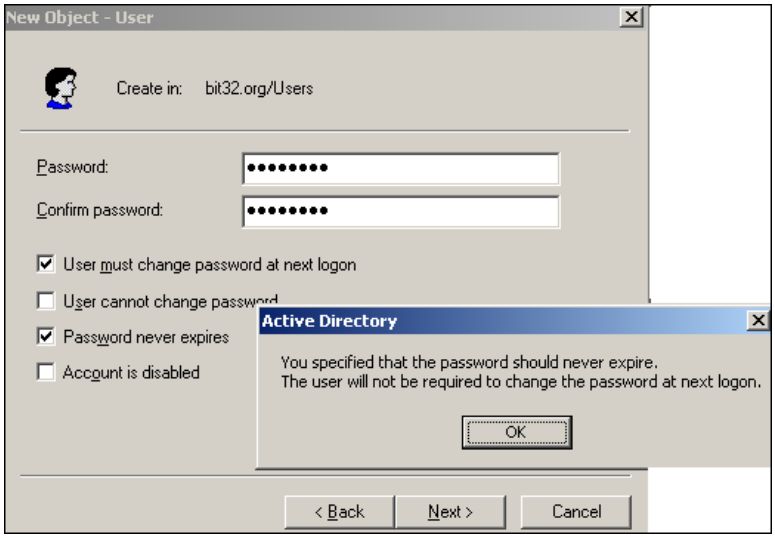


Figure 63:

Step 42. You will now see the user name details,click on **"Finish"**.

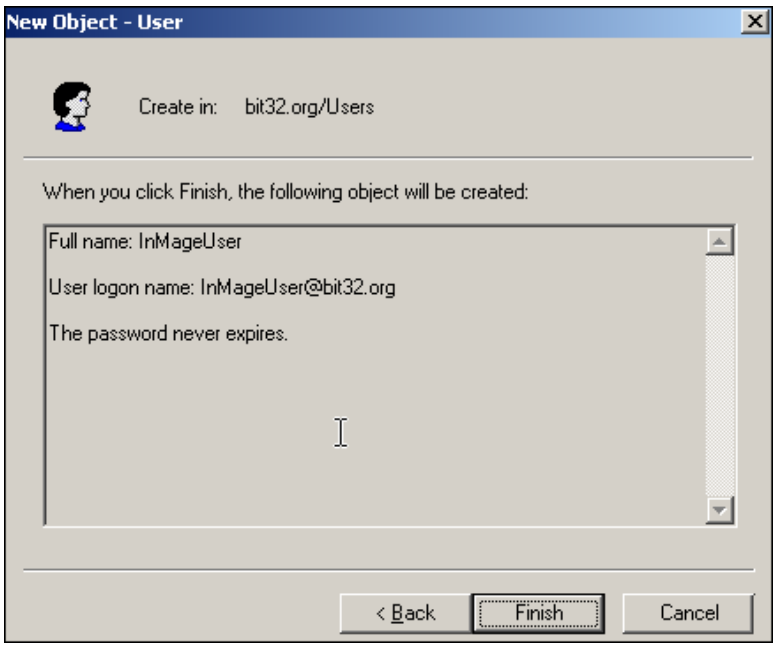


Figure 64:

Permission for DNS Record Change

Step 43. Click on "**Start->Programs->Administrative Tools->DNS**" or "**Run dnsmngmt.msc**" from command line. You should be able to see DNS management screen. Expand **"Domain",** select the source host name on the right side, right click, and click on the **"Properties"**.

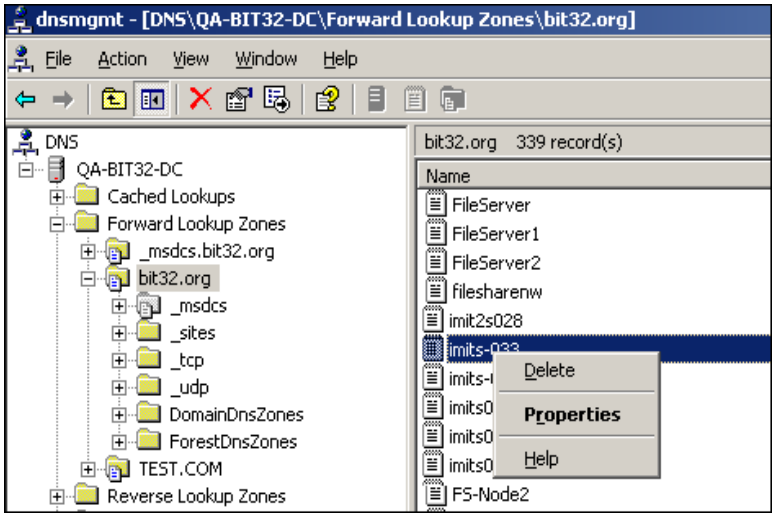


Figure 65:

Step 44. You should be able to see a source host properties screen. Click on the **"Security"** tab. Click on **"Add"**.

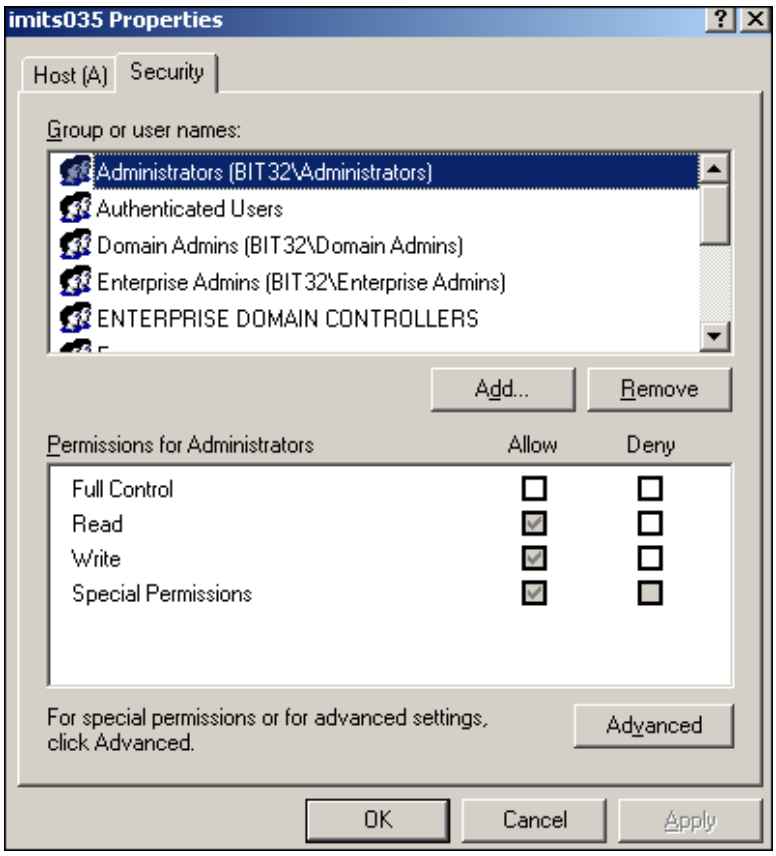


Figure 66:

Step 45. You should be able to see **"Select Users, Computers, or Groups"** screen. Select the domain user name (InMageUser) created in the previous steps and check if this username is available or not by clicking on the **"Check Names"**.

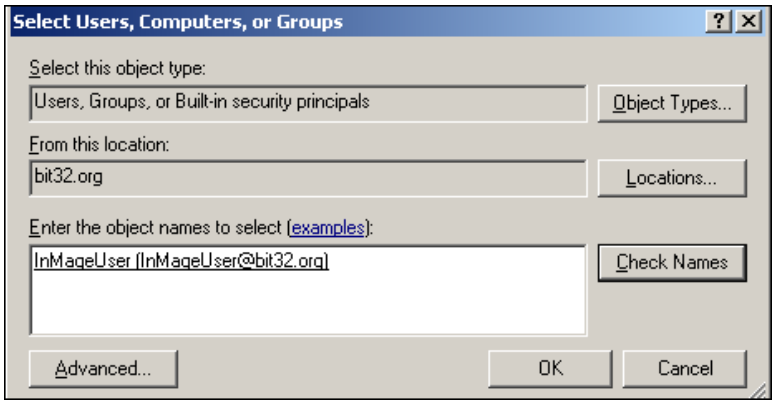


Figure 67::

Step 46. Click on **"Full Control"** check box. Click on **"OK".**

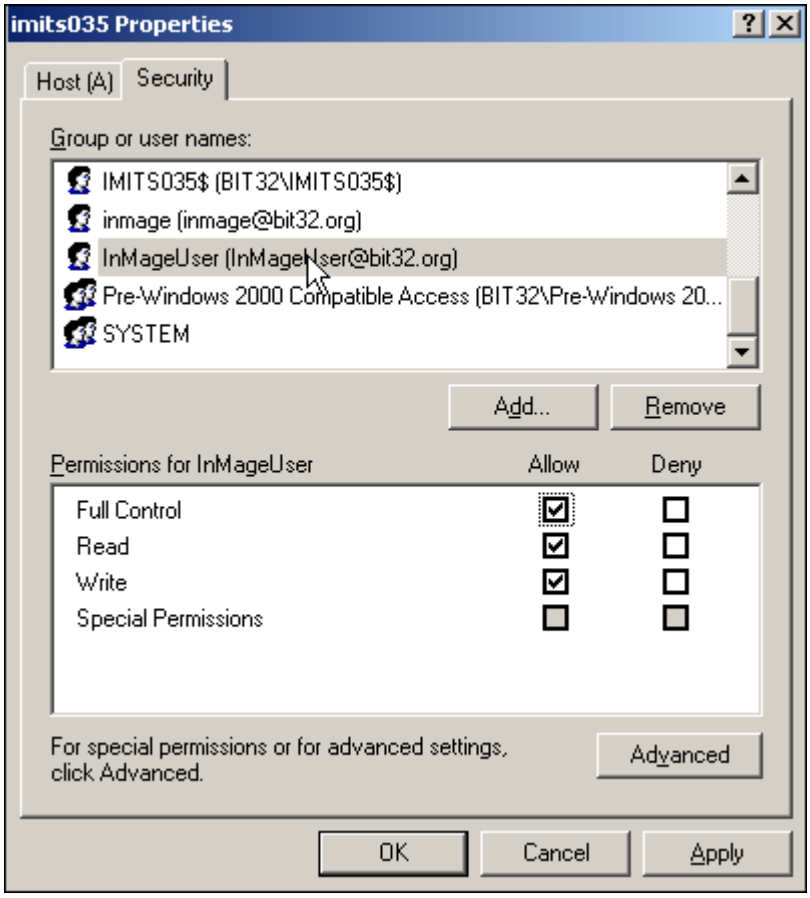


Figure 68:

Step 47. Repeat the same steps on the **"DR-Server"**

Notes:

On Cluster environment, you need to grant full privileges of DNS for the exchange virtual server name by repeating the above steps

Permission for AD Changes

Step 48. Click **"Start->Run->MMC"**, select **"Add/Remove Snap"**-from File Menu, and Click on **"Add"**.

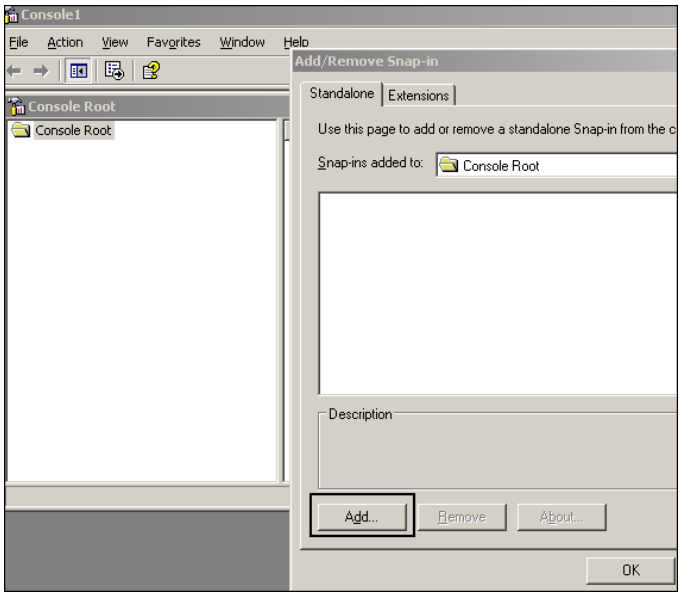


Figure 69:

Step 49. You should be able to see an **"Add Standalone Snap-in"** screen, select **"ADSI Edit"**, and click on **"Add"**.

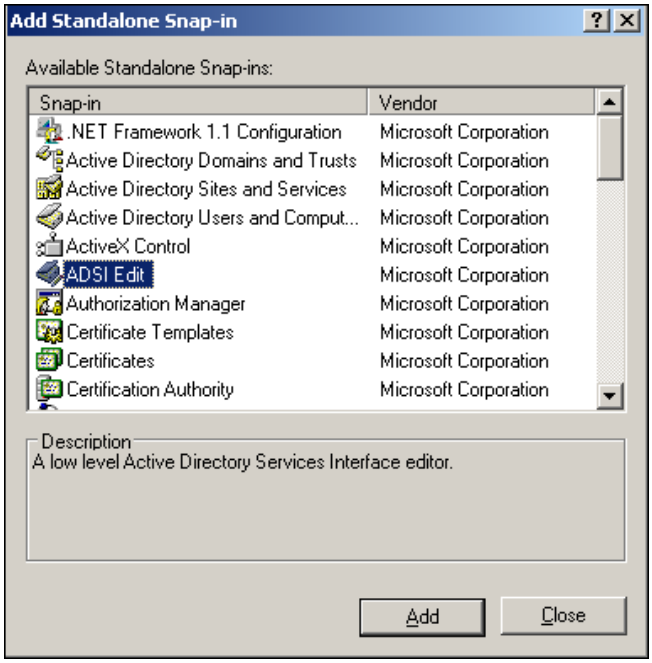


Figure 70:

Notes:

You need to install "ADSI Edit" before you add it in "Add Standalone Snap-in" (This is available in Windows Support Tools)

Step 50. You should be able to see **"Add/Remove Snap-in"** screen and click on **"OK"**.

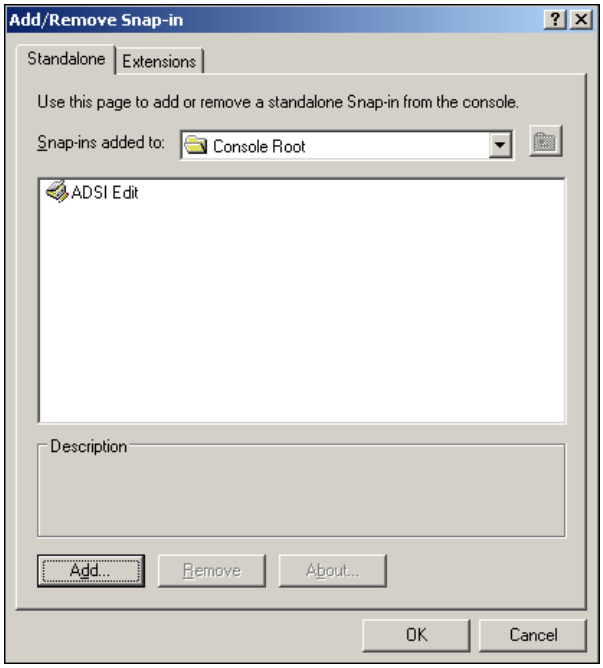


Figure 71:

Step 51. You should be able to see **"console"** screen. Select **"ADSI Edit"**, right click, and click on "**Connect To**".

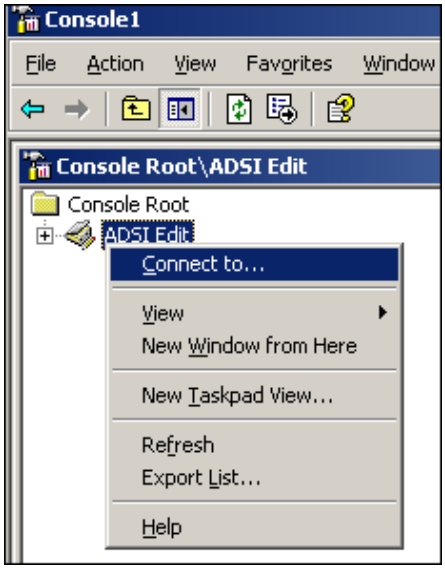


Figure 72:

Step 52. You should be able to see "**Connection Settings**" screen. Select "**Domain**" from "**Select a well known Naming Context**" and click on "**OK**".

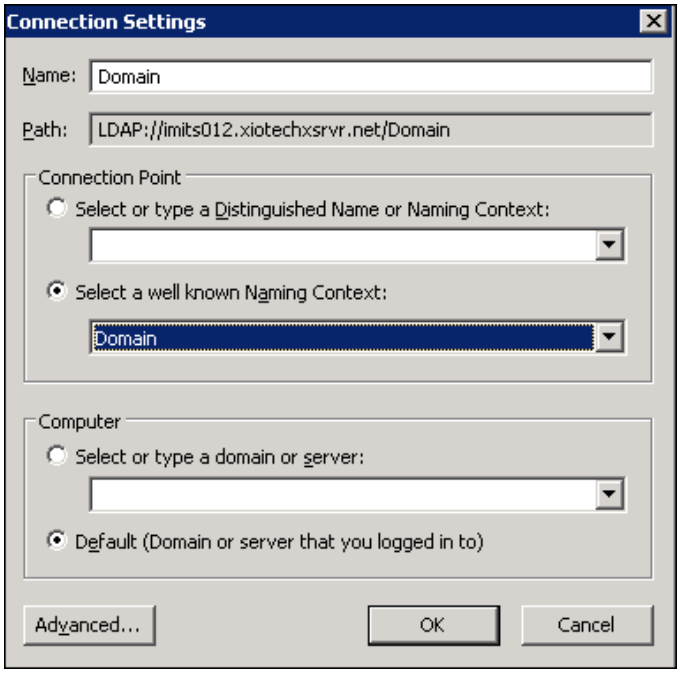


Figure 73:

Step 53. Select the "**CN=Users"** under **"Domain"** in the console root screen.

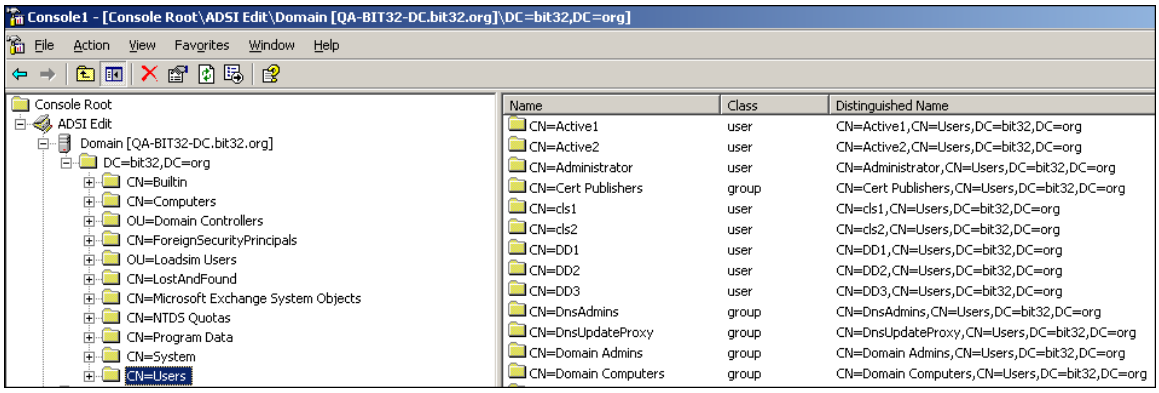


Figure 74:

Step 54. Right click and click on the **"Properties"**. You should be able to see the **"Properties"** screen and click on **"Security Tab"**. Click "**Add**"

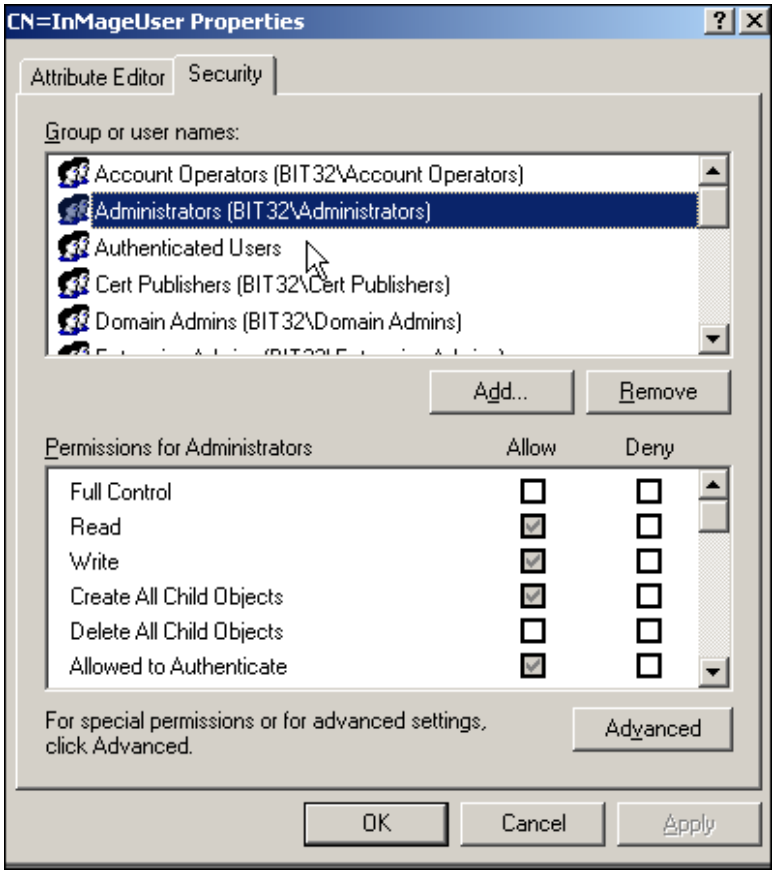


Figure 75:

Step 55. You should be able to see **"Select Users, Computers, or Groups"**. Select the domain user (InMageUser) created in the previous steps and check if this username is available or not by clicking on the **"Check Names"**. Click "**OK**".

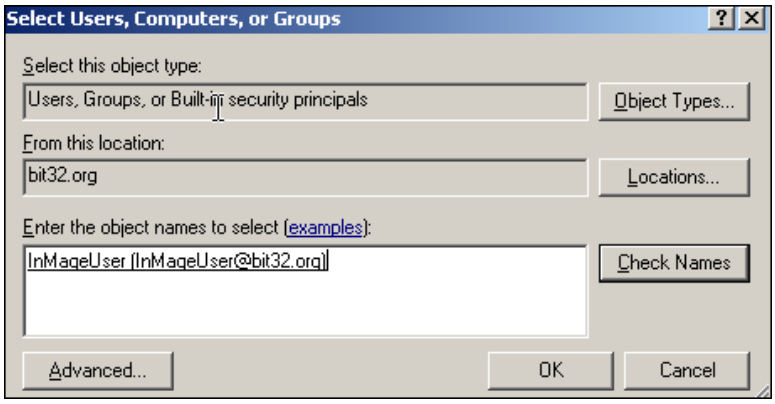


Figure 76:

Step 56. You will be returned to the previous screen. Enable the **"Full Control"** check box and click on **"OK"**. Click on "**Advanced**".

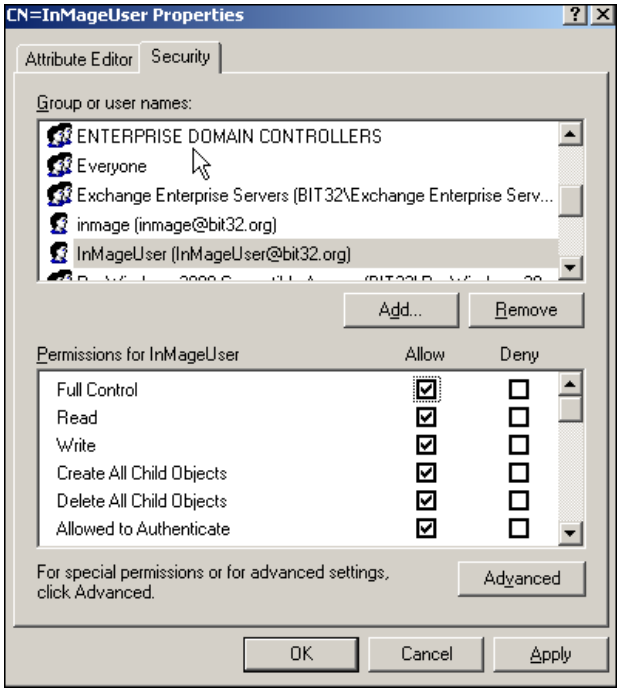


Figure 77:

Step 57. You should be able to see "**Advanced Security Settings**" screen. Select the "**Domain User**" name (InMageUser), click on "**Edit**".

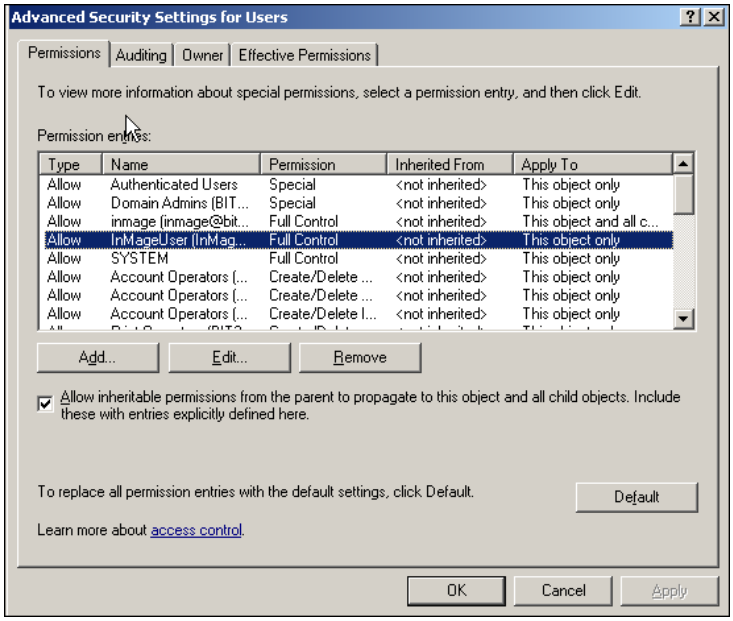


Figure 78:

Step 58. You should be able to see "**Permission Entry for Users**" screen. Select "This Object and all Child Objects" from "**Apply Onto**".

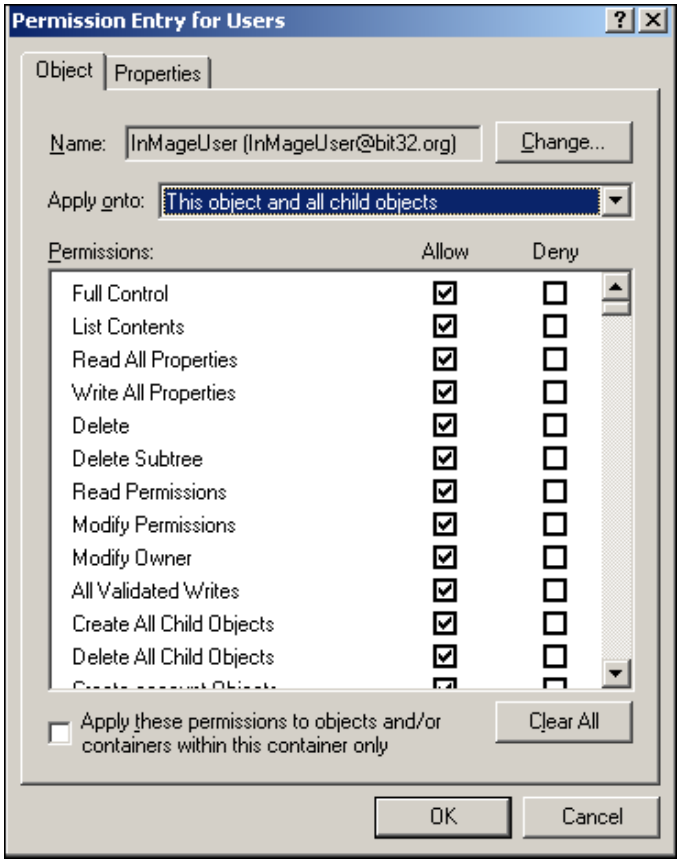


Figure 79:

Step 59. You should be able to see console screen, select "**CN-Computers"** object, select the **"Production Server"**, right click, and click on the **"Properties"**.

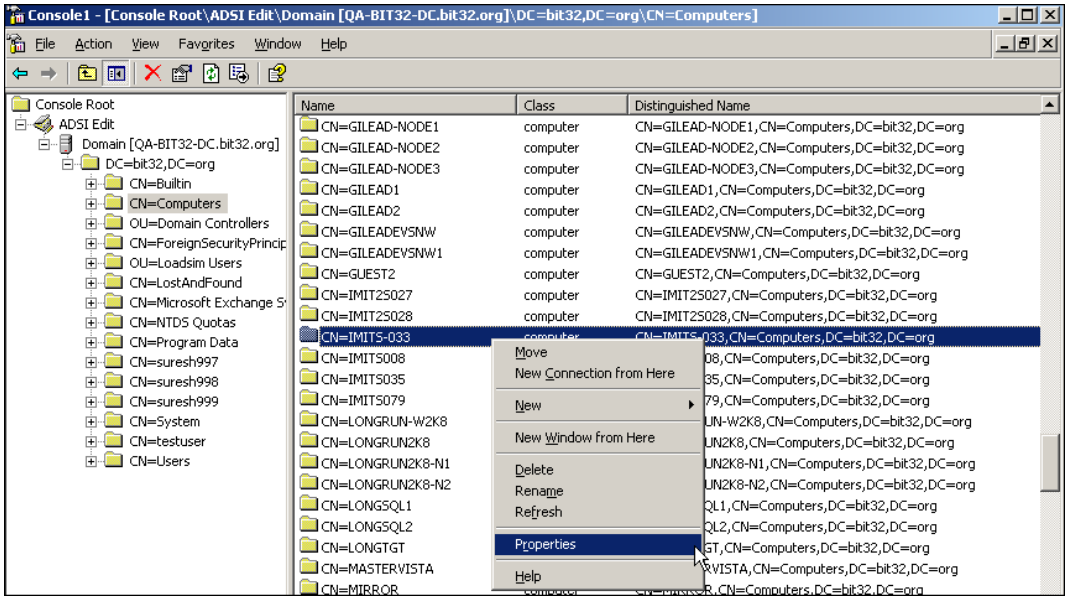


Figure 80:

Step 60. Right click and click on the **"Properties"**. You should be able to see the **"Properties"** screen and click on **"Security Tab"**. Click on "**Add**".

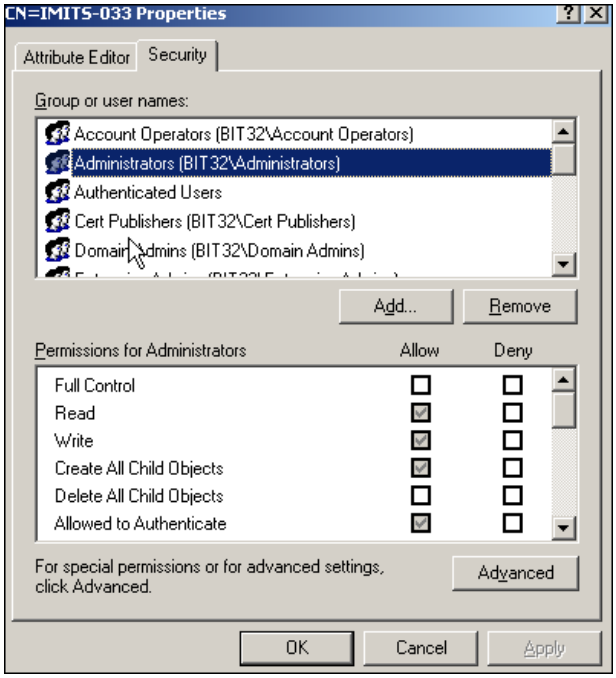


Figure 81:

Step 61. You should be able to see **"Select Users, Computers, or Groups"**. Select the domain user name (InMageUser) created in the previous steps and check if this username is available or not by clicking on the **"Check Names"**. Click on "**OK**".

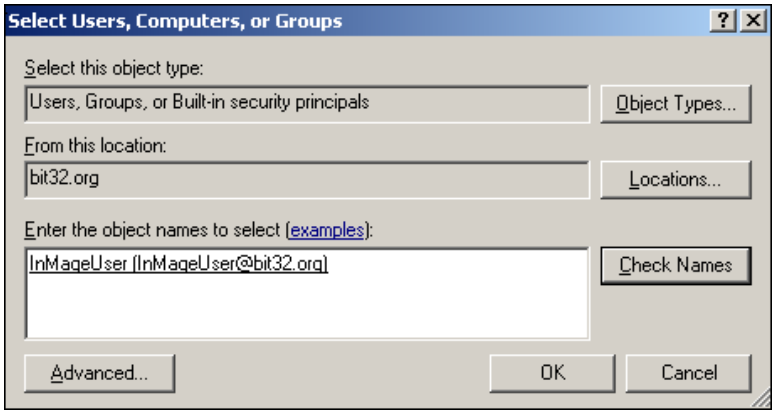


Figure 82:

Step 62. You will get previous screen. Click on **"Full Control"** check box under permission for test and click on "**Apply**" and then "**OK"**.

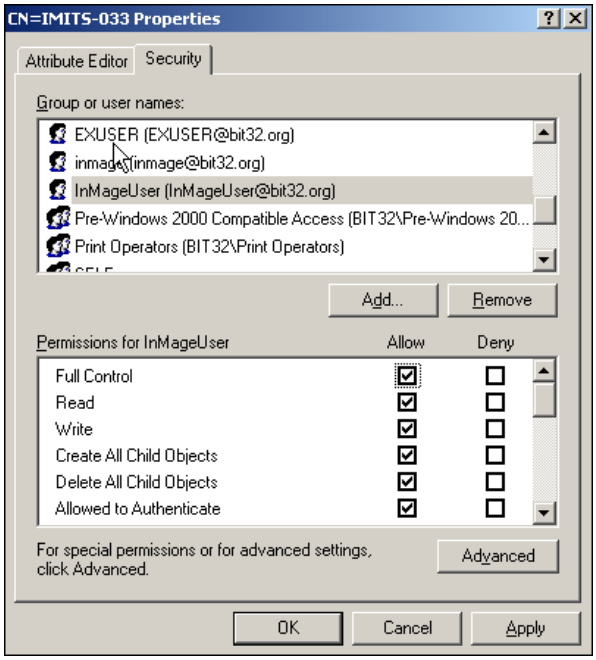


Figure 83:

Step 63. Repeat the same steps for the **"DR-Server "**

Notes:

In Cluster case, you need to select the network name (Virtual Server Name) and give DNS privileges by repeating steps 1 to 4.

Permissions for AD changes For Configuration

Step 64. You should be able to see **"console"** screen. Select **"ADSI Edit"**, right click and click on "**Connect To**".

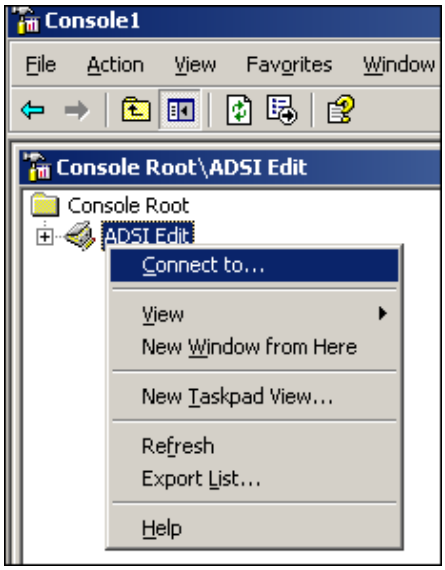


Figure 84:

Step 65. You should be able to see "**Connection Settings**" screen and "**Select a well known Naming Context**" as "**Configuration**"

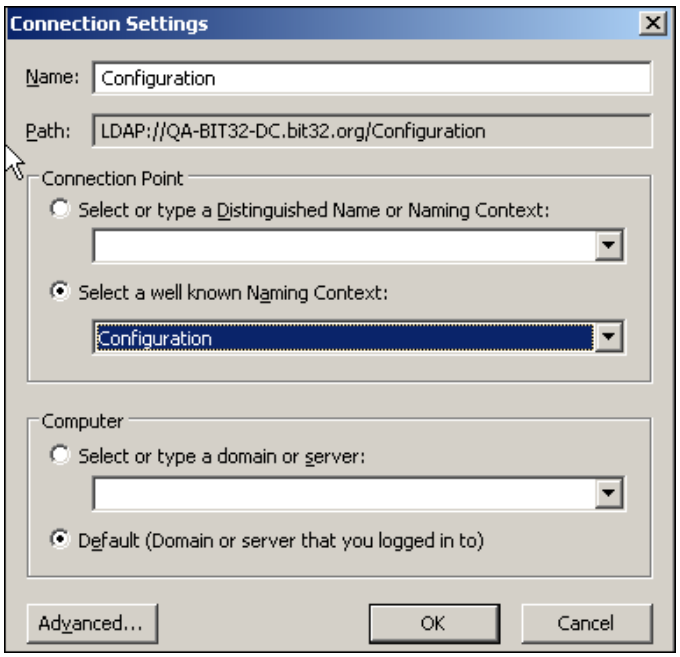


Figure 85:

Step 66. Expand the configuration tree, expand "**CN=Configuration**" object, and then expand "**CN=Services**" object. Select "**Microsoft Exchange"** object and right click on the "**Properties**".

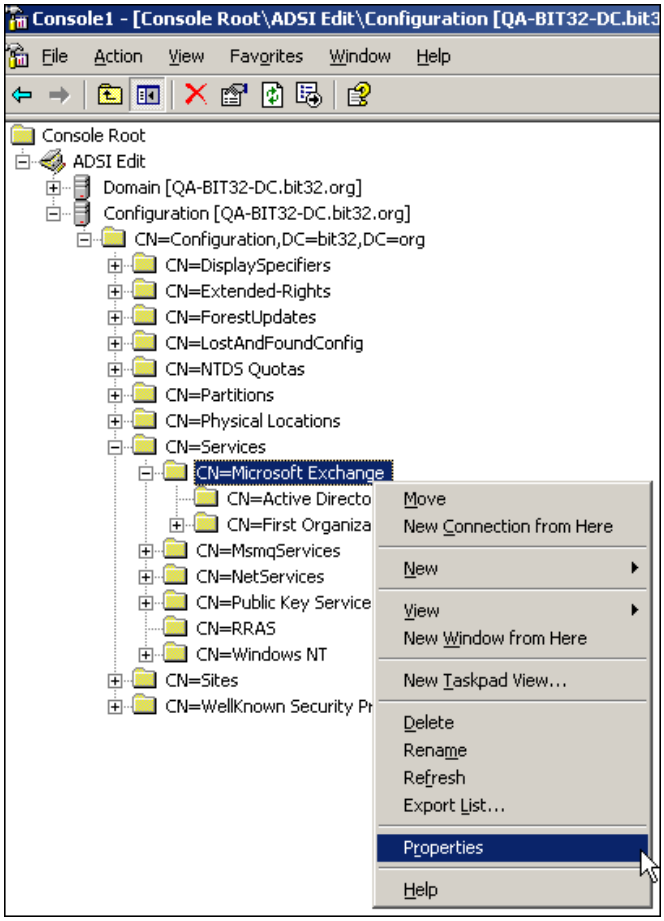


Figure 86:

Step 67. Right click and click on the **"Properties"**. You should be able to see the **"Properties"** screen and click on **"Security Tab"**. Click on "**Add**".

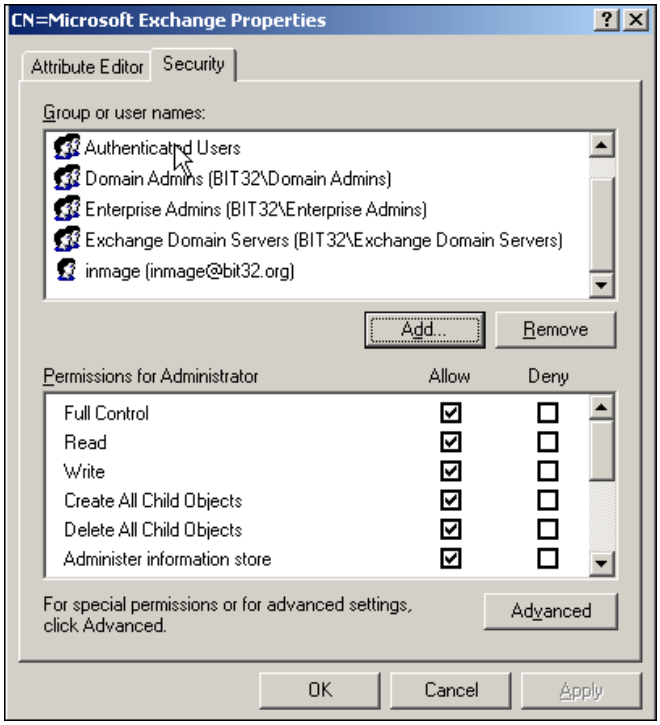


Figure 87:

Step 68. You should be able to see **"Select Users, Computers, or Groups"**. Select the domain user (InMageUser) created in the previous steps and check if this username is available or not by clicking on the **"Check Names"**. Click on "**OK**"

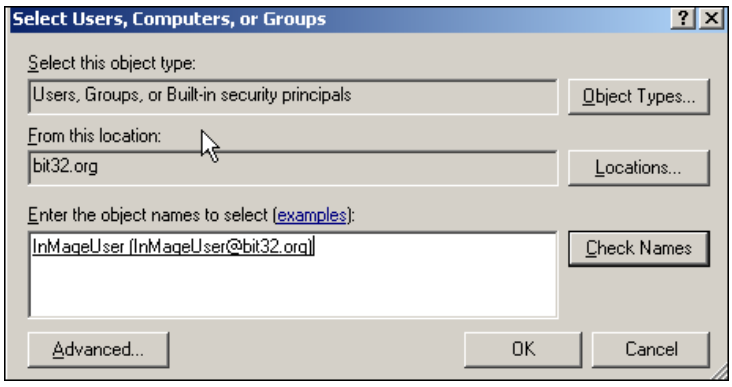


Figure 88:

Step 69. You will be able to see the previous screen. Click on "**Advanced**".

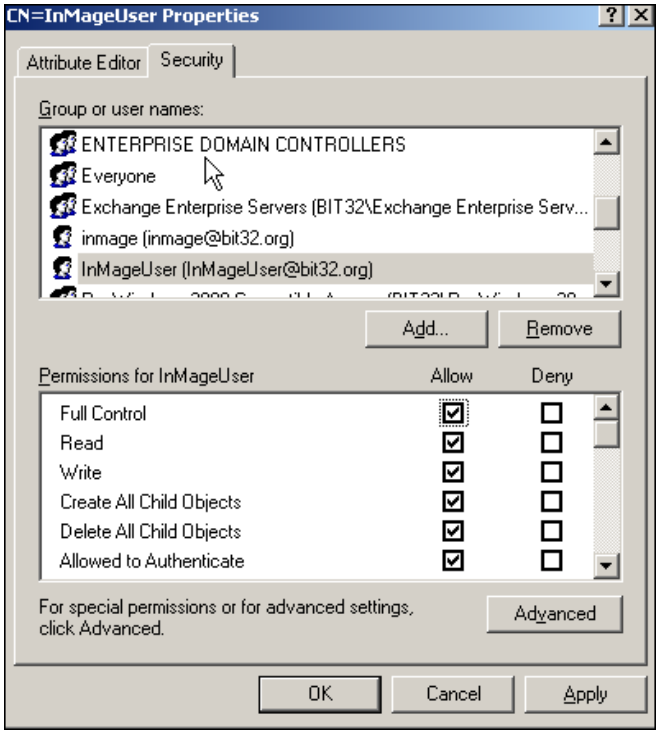


Figure 89:

Step 70. You should be able to see "**Advanced Security Settings**" screen. Select the "**Domain User**" name (InMageUser), click on "**Edit**".

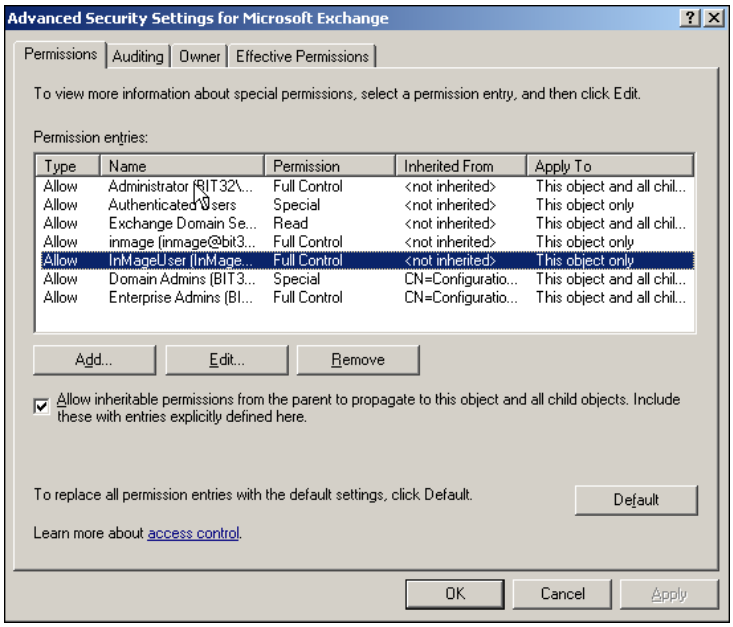


Figure 90:

Step 71. You should be able to see "**Permission Entry for Users**" screen. Select "**This Object and all Child Objects**" from "**Apply Onto**". Click "**OK**"

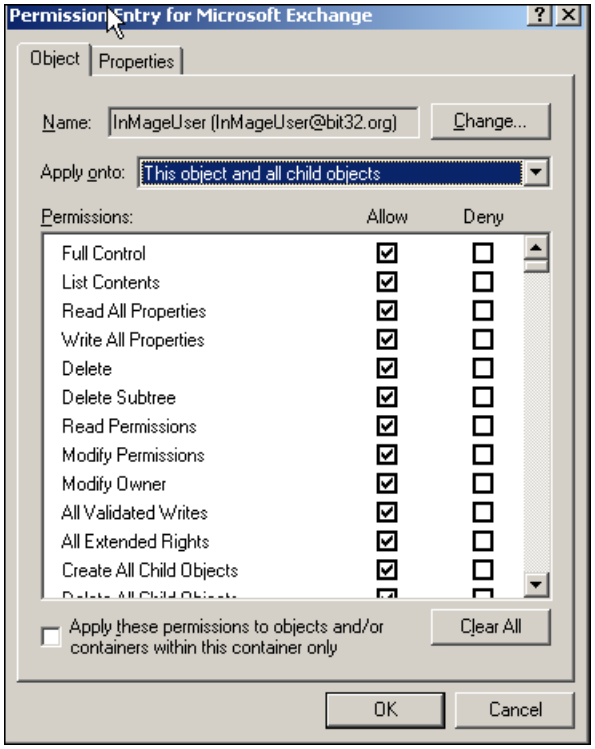


Figure 91:

Step 72. This leads to the previous screen and click on **"OK"**.

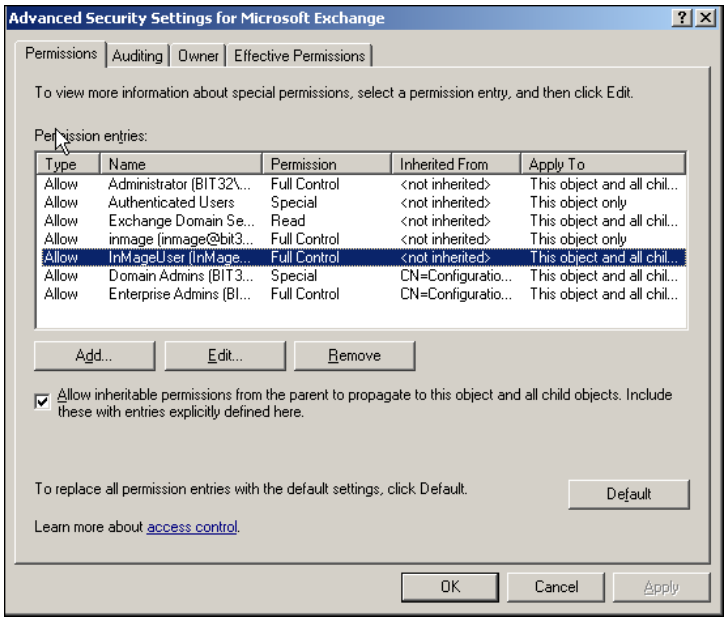


Figure 92:

Step 73. Click on **"Full Control"** check box under permission for test and click on **"OK"**.

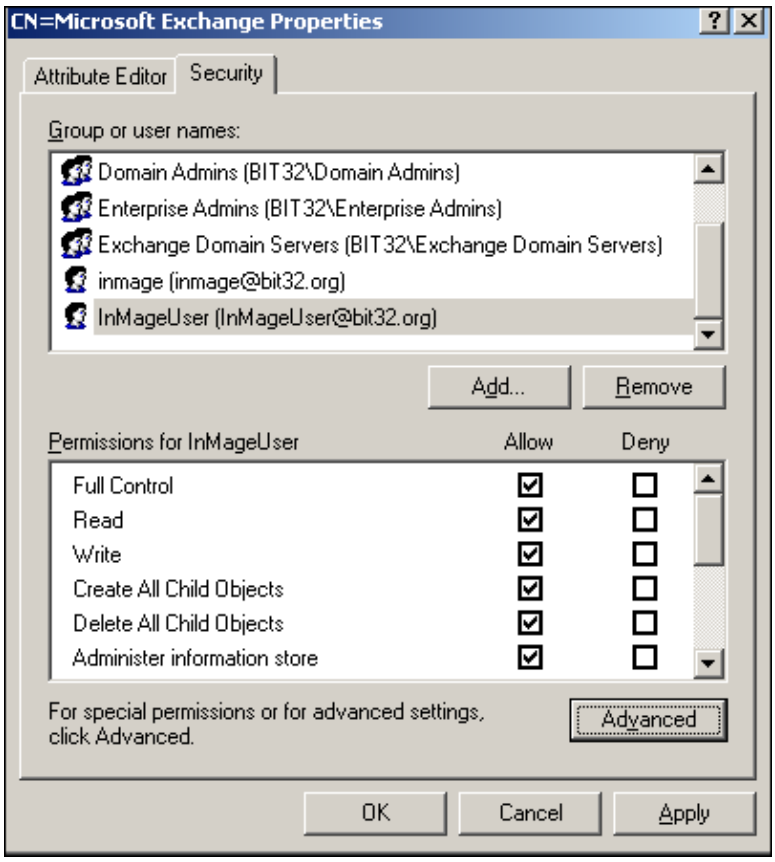


Figure 93:

Adding User to Host Machines

Step 74. Logon to **"Production Server"** with the domain administrator. Open Computer management console, click "**Groups**" under **"Local Users and Groups"**, and click on "**Administrators**".

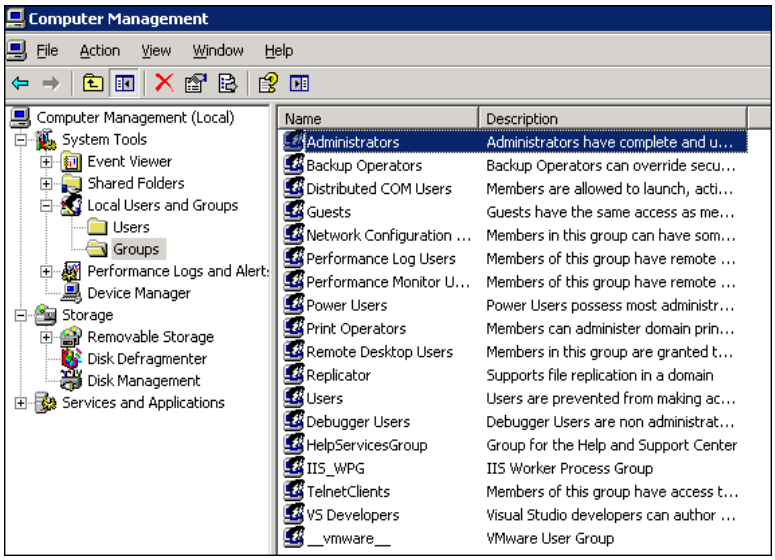


Figure 94:

Step 75. You should be able to see administrator's properties screen and click on **"Add"**.

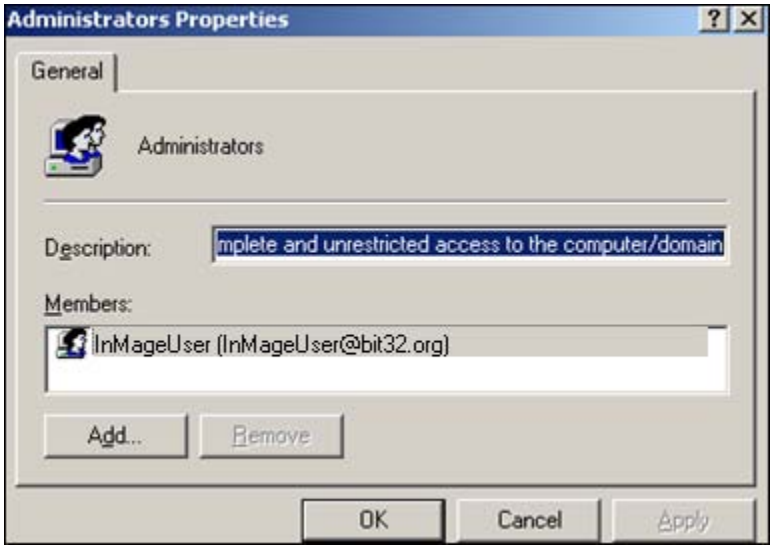


Figure 95:

Step 76. You should be able to see **"Select Users, Computers, or Groups"**, Select the domain user name (InMageUser) created in the previous steps and check if this username is available or not by clicking on the **"Check Names"**. Click "**OK**"

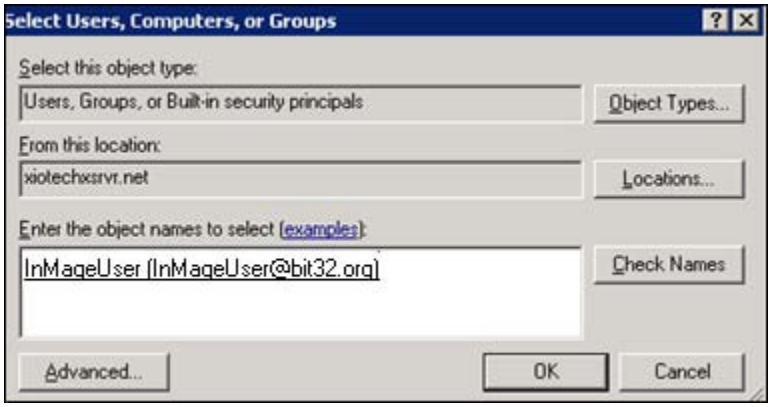


Figure 96::

Step 77. Click "**Start->Control Settings->Administrative Tools**". You should be able to see "**Administrator's Properties**" screen. Now, click on "**Apply**" and then on "**OK**".

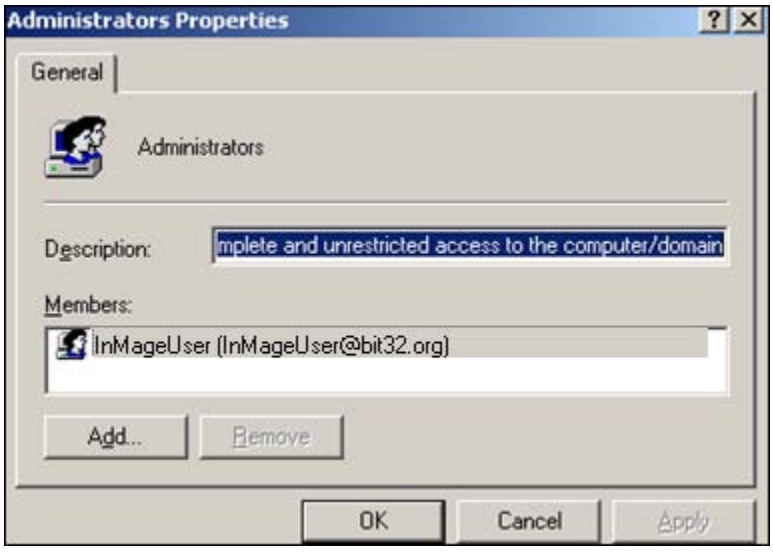


Figure 97:

Notes:

On cluster environment, you need to add domain user to each node.

Adding user to logon service

Step 78. Log on to "**Production Server**" with domain user. Click "**Start->Program Files->Administrative Tools->Local Security Policy**".

Figure 98:

Step 79. You should be able to see "**Local Security Settings**" screen, select "**User Rights Assignment**", and select "**Log on as a Service**".

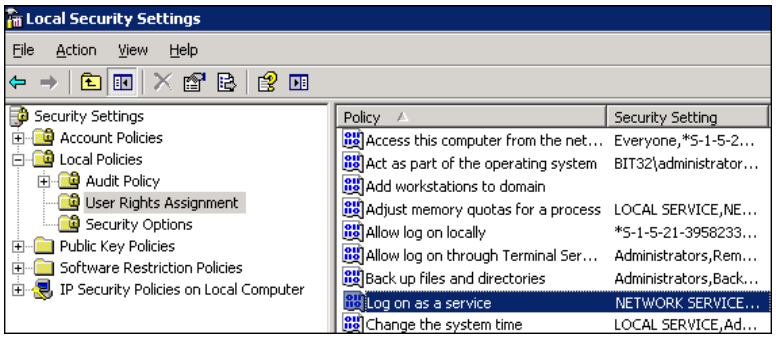


Figure 99:

Step 80. You should be able to see **"Log on as a Service Properties"** screen, click on **"Add User or Group"**, and click on **"OK"**.

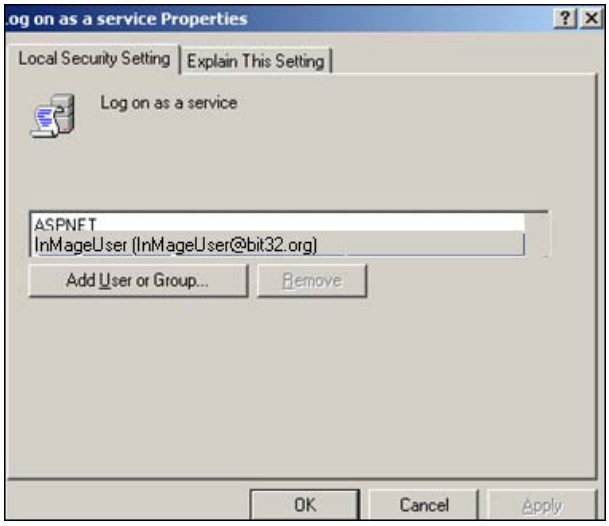


Figure 100:

Step 81. This should open **"Select Users, Computers, or Groups"** screen, select the domain user name created in the previous steps and check if this username is available or not by clicking on the **"Check Names"**.

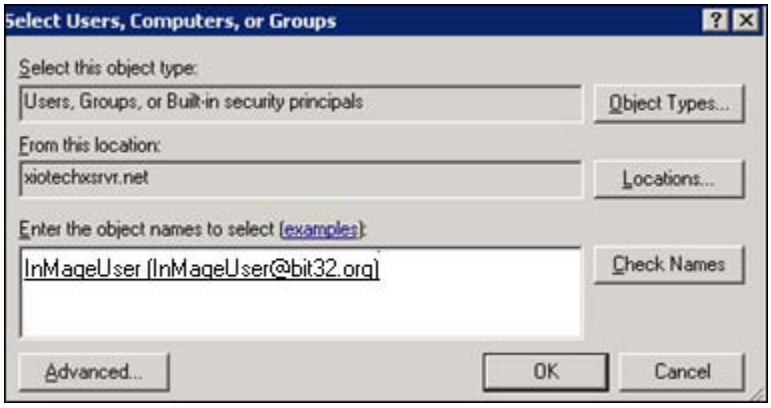


Figure 101:

Step 82. You should be able to see the previous screen. Now, click on **"Apply"**, and then on **"OK"**.

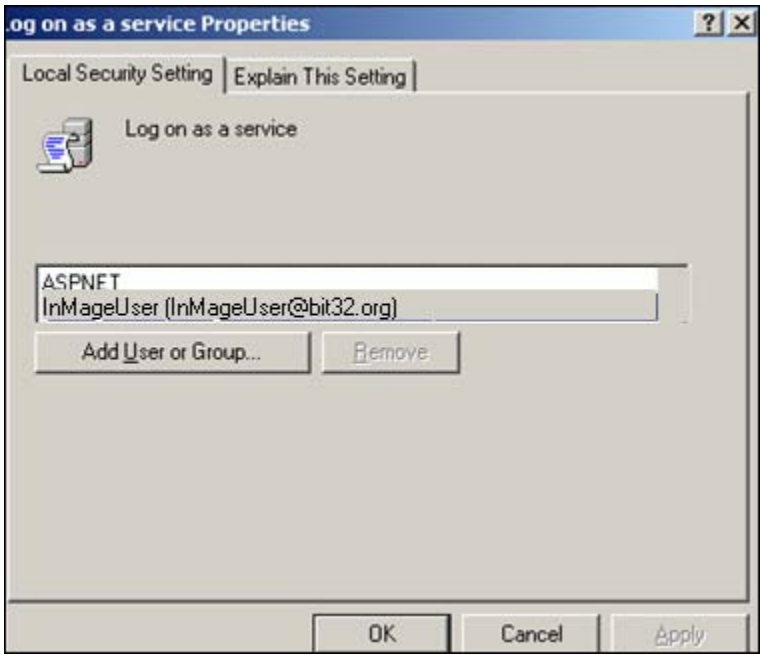


Figure 102:

Step 83. Log on to **"Production Server"** with the domain user created above. Click "**Start->Run->Services.msc"**, select the **"FX agent service"**, right click, and click on the **"Properties"**.

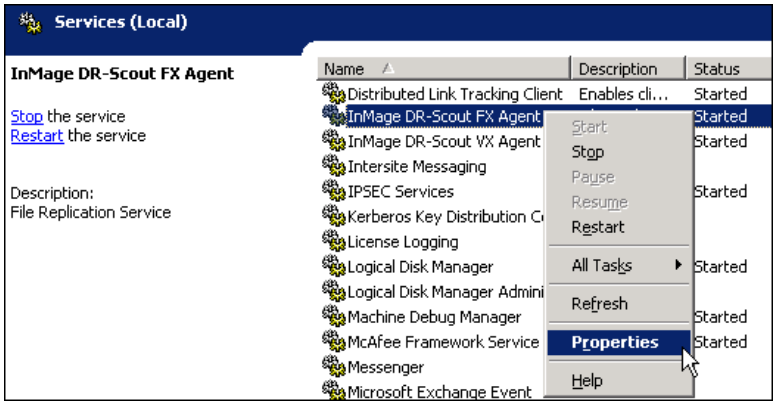


Figure 103:

Step 84. You should be able to see the **"FX agent Properties"** screen. Enter the **"Domain Username"** and password details. Then, click on **"Apply"** and then **"OK".**

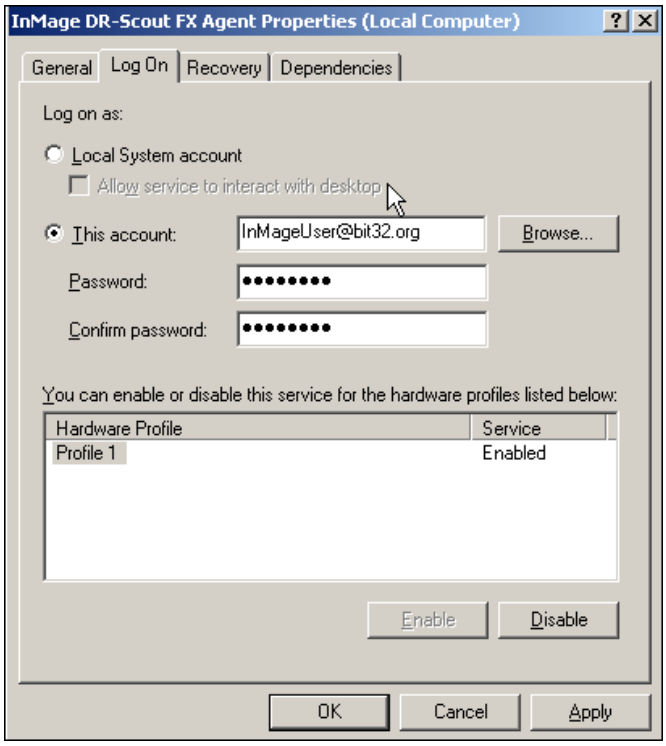


Figure 104:

Step 85. Restart the "**FX Agent Service**". Repeat the same steps for the DR-Server

Notes:

In Cluster case, you need to add domain user to each node. Repeat the steps from 1 to 8.

Part 1: Non-Cluster Exchange Environment

This part describes Exchange server protection in a non-cluster environment where production server and DR server both are standalone.

5 Protecting Exchange

5.1 Protecting Exchange (DB and logs on same volume)

This section explains protecting Exchange server when Exchange log files and Exchange database are on the same volume.

5.1.1 Discover Exchange volumes

5.1.1.1 Through CX UI

Step 86. Open the CX user interface, click on "**File Protection**" then click on "**New Job Group Wizard**".

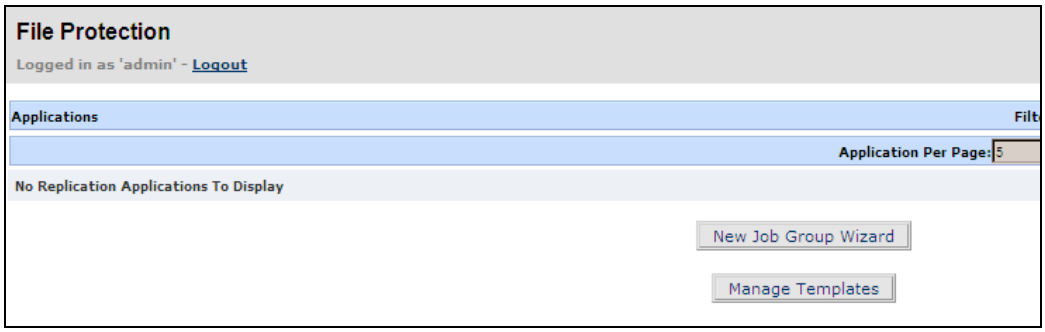


Figure 105

Step 87. This opens up the File protection wizard. Click on "**Add Job**".

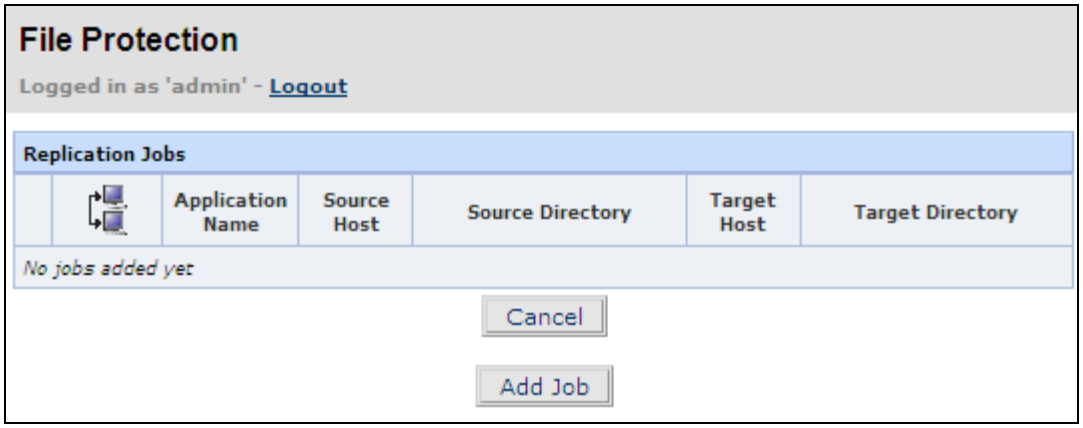


Figure 106

Caution:

To perform an unplanned Exchange failover it is critical to perform the Exchange Discovery at least once.
Ensure that the FX agent service is running with domain administrator privileges.

Step 88. Select the production exchange server as source and the backup exchange server as destination. (In this example the source exchange is **Exchange_Prod** and the target exchange is **Exchange _DR**). Select the template as "**Exchange Discovery**" as shown in the picture below. Then click on "**Next".**

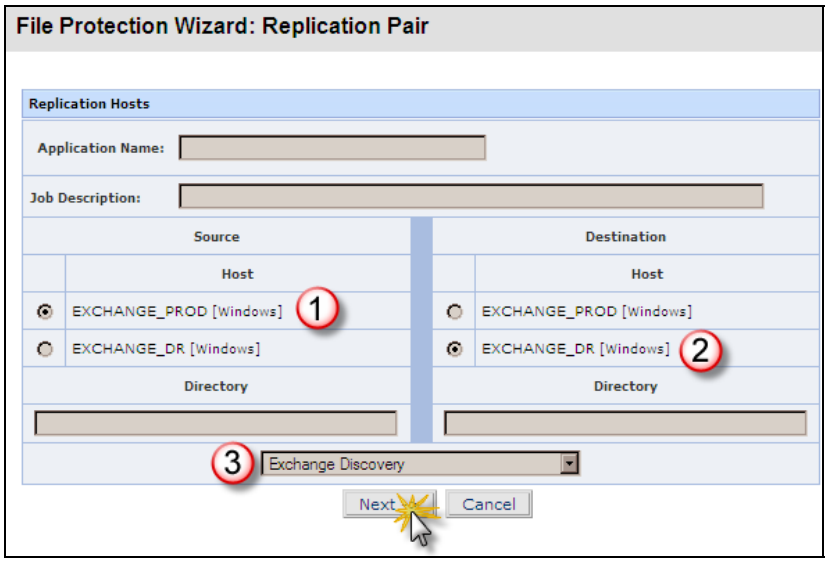


Figure 107

Step 89. The FX "**Job Options**" opens up with the required fields filled up. Scroll down to "**Miscellaneous Options**" to observe that the target post script is filled up. Click on "**Finish**" without changing any settings.

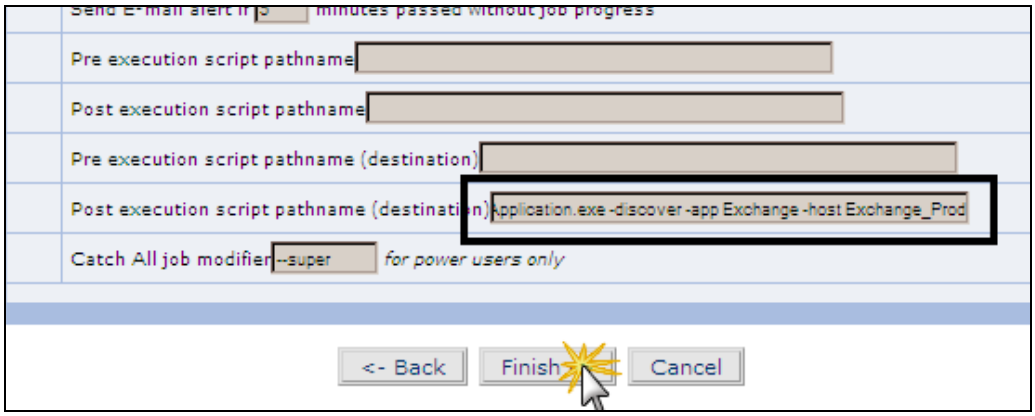


Figure 108

Notes:

Optionally to restrict Exchange Discovery to the EVS, you may append the switch "–host <name of the production server>" at the end of the target post script as shown in the above picture.

Step 90. The Job will be set to execute once a day. Click on "**Set Schedule**" to change the job scheduled option.

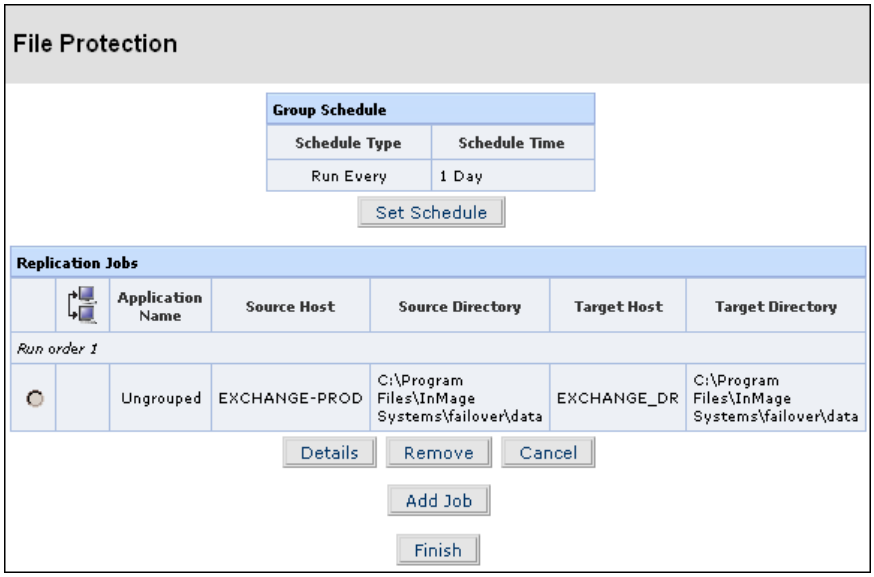


Figure 109

Step 91. The FX job Scheduler opens up. Set the job to "**Run on Demand**" and click on "**Set Schedule"** to return to previous screen and click on "**Finish**" to complete setting up the job.

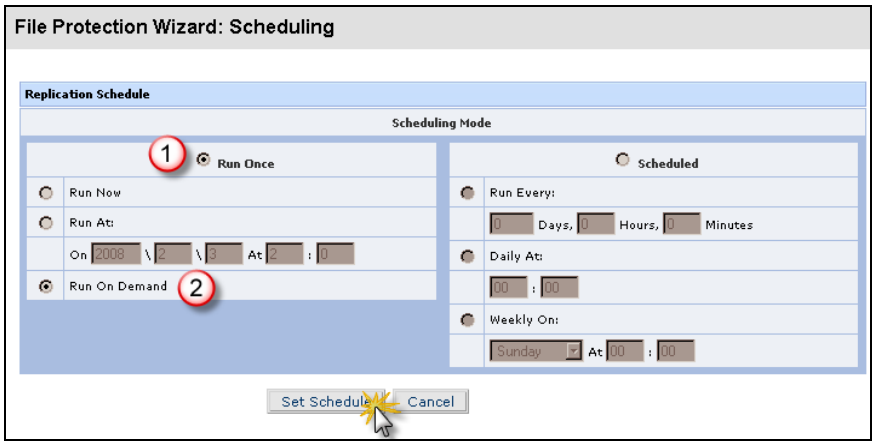


Figure 110

Step 92. Now that the job is setup, click on "**File Protection**" on the command pane and then select the job and click on "**Start**" as shown below.

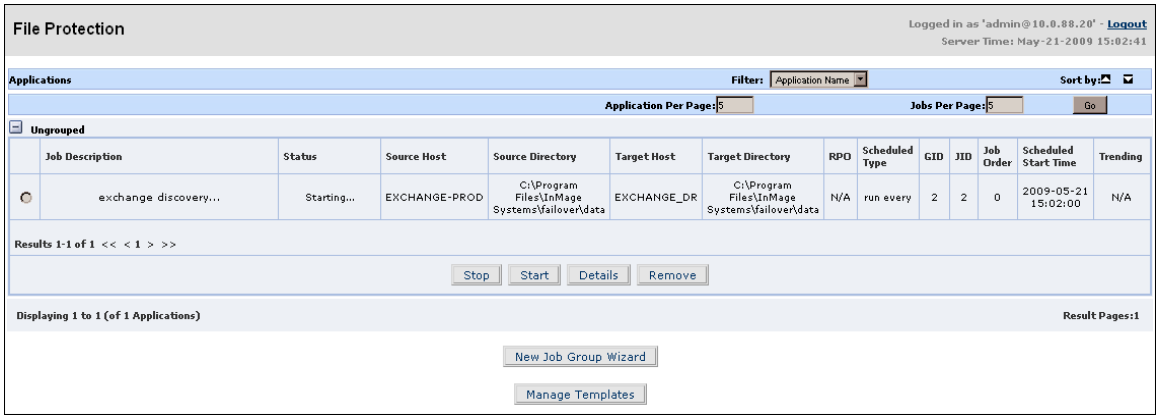


Figure 111

5.1.1.2 Through CLI

Alternatively, you may choose to perform Exchange discovery through command line. Access the target command prompt and navigate to the VX agent install path to issue the below command:

For exchange 2003 and 2007 the syntax is
`Application.exe -discover -app exchange -host <`*name of the source exchange server***`>`**

```
C:\Program Files\InMage Systems>Application -discover -app exchange -host Exchange_Prod
Attempting to determine Exchange Virtual Server name for host : Exchange_Prod in case it's a
clustered configuration

Command Line: Application -discover -app exchange -host Exchange_Prod
Running under the user: BIT32.ORG\administrator
Process ID: 2084


Discovering volumes for the host: imits035

Start persisting the log configuration for server : Exchange_Prod
abspath=\\imits035\K$\FSG
Unique Volume/MountPoint with data/log file \\ Exchange_Prod\K$\FSG is \\Exchange_Prod\K$\
abspath=\\imits035\K$\FSG\Mailbox.edb
Unique Volume/MountPoint with data/log file \\Exchange_Prod\K$\FSG\Mailbox.edb is \\Exchange_Prod\K$
abspath=\\imits035\K$\FSG\Public.edb
Unique Volume/MountPoint with data/log file \\Exchange_Prod\K$\FSG\Public.edb is \\Exchange_Prod\K$\
File path: K:\FSG
abspath=\\imits035\K$\FSG
Unique Volume/MountPoint with data/log file \\ Exchange_Prod\K$\FSG is \\Exchange_Prod\K$\
File path: K:\FSG\Mailbox.edb
abspath=\\imits035\K$\FSG\Mailbox.edb
Unique Volume/MountPoint with data/log file \\Exchange_Prod\K$\FSG\Mailbox.edb is \\Exchange_Prod\K$
File path: K:\FSG\Public.edb
abspath=\\imits035\K$\FSG\Public.edb
```
Figure 112

Step 93. Once the job completes its execution, the "**Application"** field under "**Volume Protection-> Source Site"** displays the application name as Microsoft Exchange 2003 (for exchange 2003)

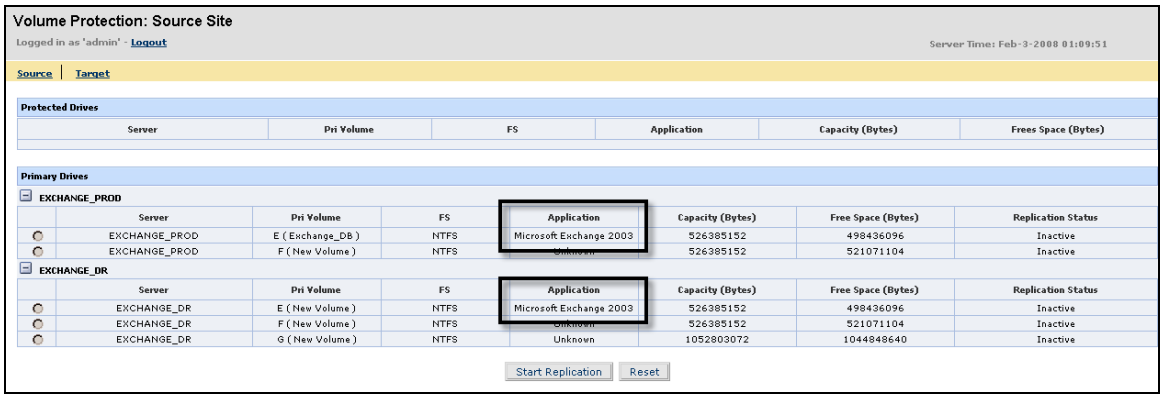


Figure 113

Notes:

For exchange 2007 the display name will differ

Discovery job is to be performed before setting the replication pairs, after setting up replication pairs and after any Exchange configuration changes.

5.1.2 Replicate discovered volumes

Now that the exchange volume(s) are discovered proceed to replicate them to a remote exchange host.

In this example, exchange log files and database files are located on a single volume (E volume).

Step 94. Click on "**Volume Protection**", expand the source exchange server to select the exchange volume, and then click on "**Start Replication**"

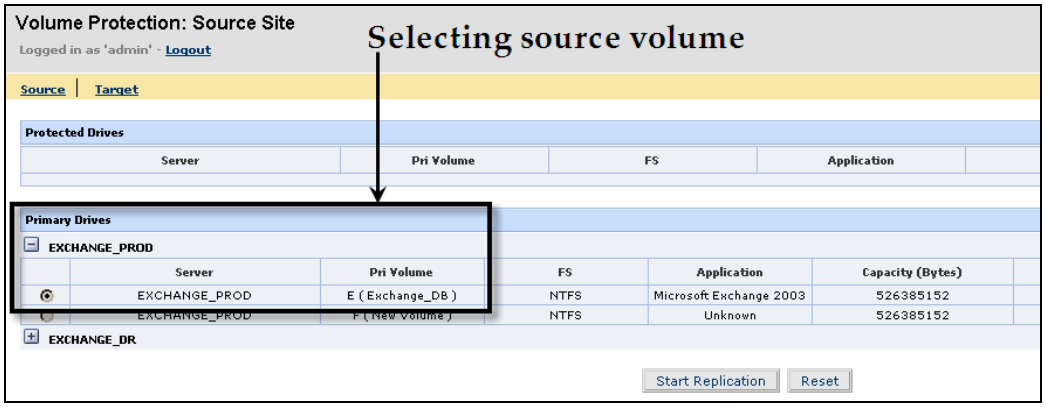


Figure 114

Step 95. The target page opens up. Expand the target exchange server to select a target volume then scroll down to set the "**Replication options"**

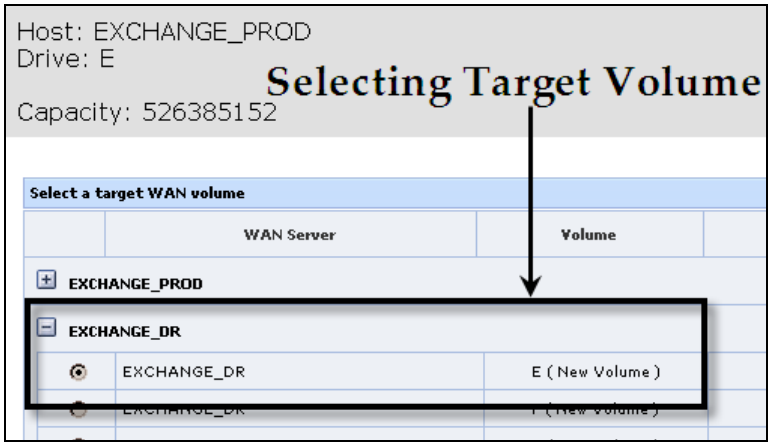


Figure 115:

Caution:

Ensure that you replicate the source volume to the same drive letter (or mount point) on the target host. For example E: to E:
Automated failover is not supported when source and target volumes have different drive mapping.

Step 96. While you can select any of the "**Replication Options**" be sure that the "**Enable CDP Retention Option**" is enabled then click on "**Submit**".

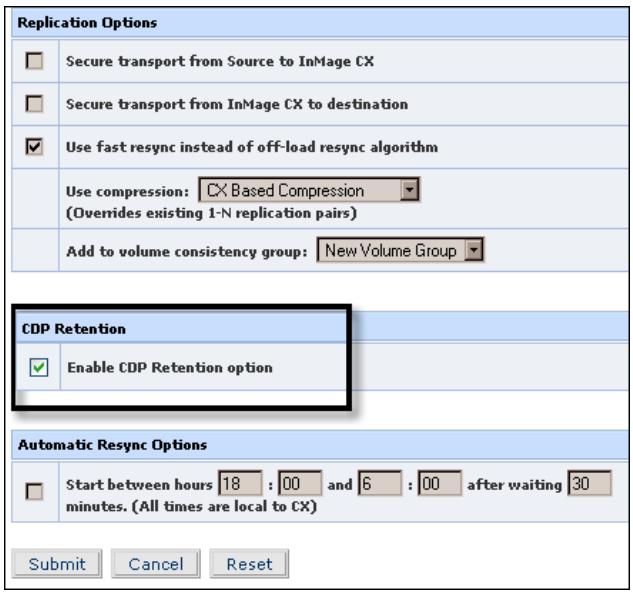


Figure 116

Step 97. Since "**CDP retention**" is selected, the corresponding retention policy has to be defined. This is the screen where the type of retention policy (time, space or a combo policy) is defined. Define the policy and click on "**Submit**" to start the replication pair.

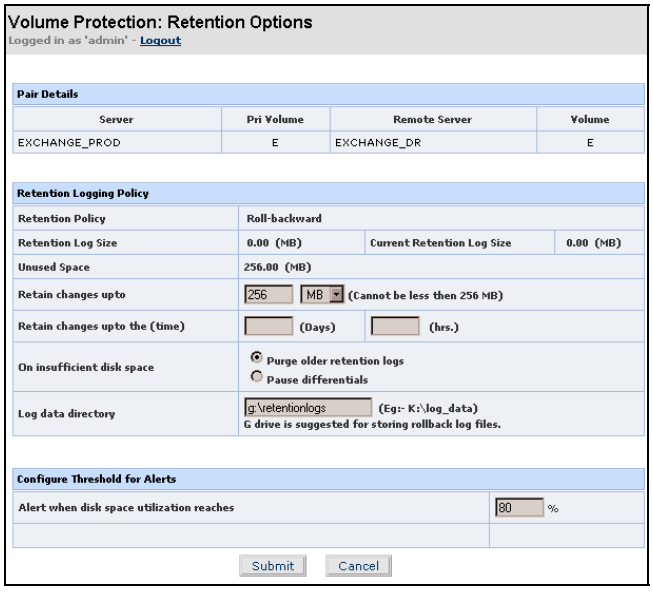


Figure 117

Notes:

By default 256 MB is left free on the retention volume. You may choose to reduce this free space limit through "System -> Agent Settings -> Retention Reserve Space Settings" to reduce the "Unused space" on retention volume

Step 98. Click on the "**Protection Status**" to monitor the replication pair. The status of the replication pair starts with "**Resyncing step 1"** then "**Resyncing step 2"** and then reaches "**Differential Sync**"

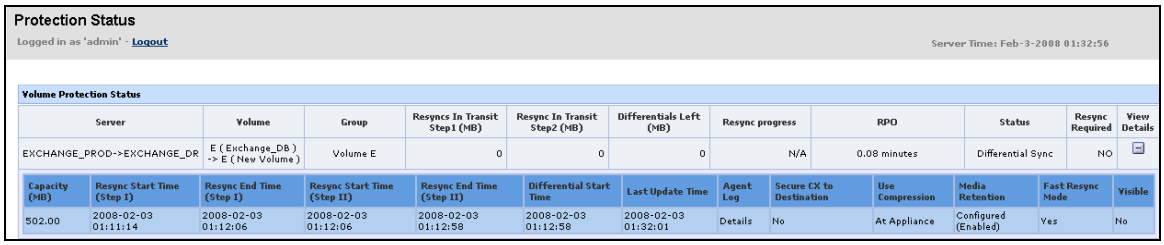


Figure 118

Step 99. Once the replication pairs reach "**Differential Sync"** run the Discovery job. For each EVS (Exchange Virtual Server) or Exchange server, a total of three files are created on the corresponding DR server. These files contain :

- List of Exchange VX Replication pairs
- Retention logs of each replication pair
- Exchange database and log file location.

This information is later used while recovering from a production site outage.

Caution:

If the discovery job is not run after setting the replication pairs, Unplanned failover cannot be performed.

5.1.3 Issue consistency tags

5.1.3.1 Through CX UI

Step 100. The vacp.exe consistency tag can be issued through an FX job, click on the "**File Protection",** and then click on **"New Job Group Wizard"**.

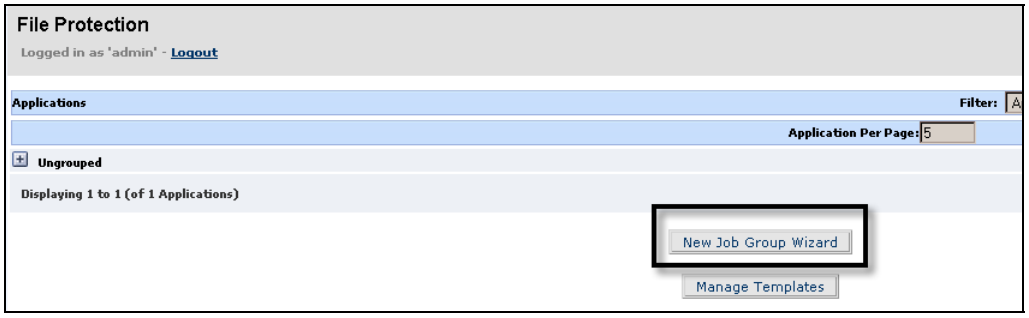


Figure 119

Step 101. The "**File Protection Group**" screen appears. Click on "**Add Job**".

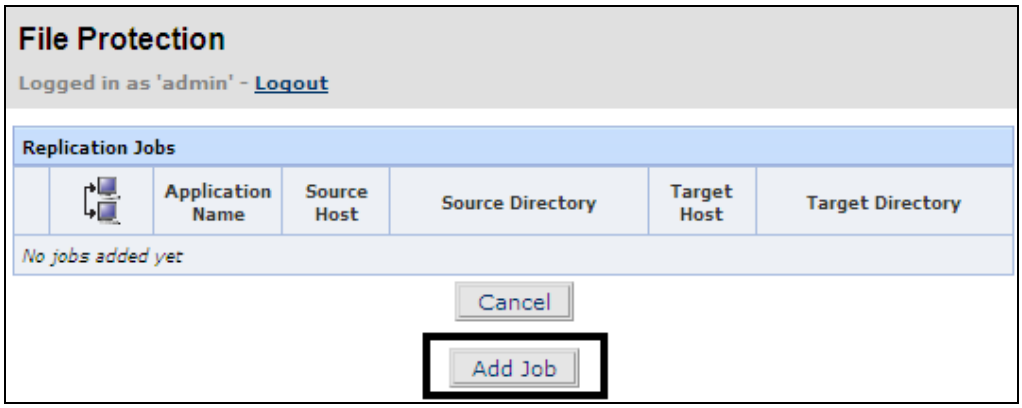


Figure 120

Step 102. Select the production exchange server as source and destination then select the FX template as "**Exchange Consistency**" and click on "**Next**".

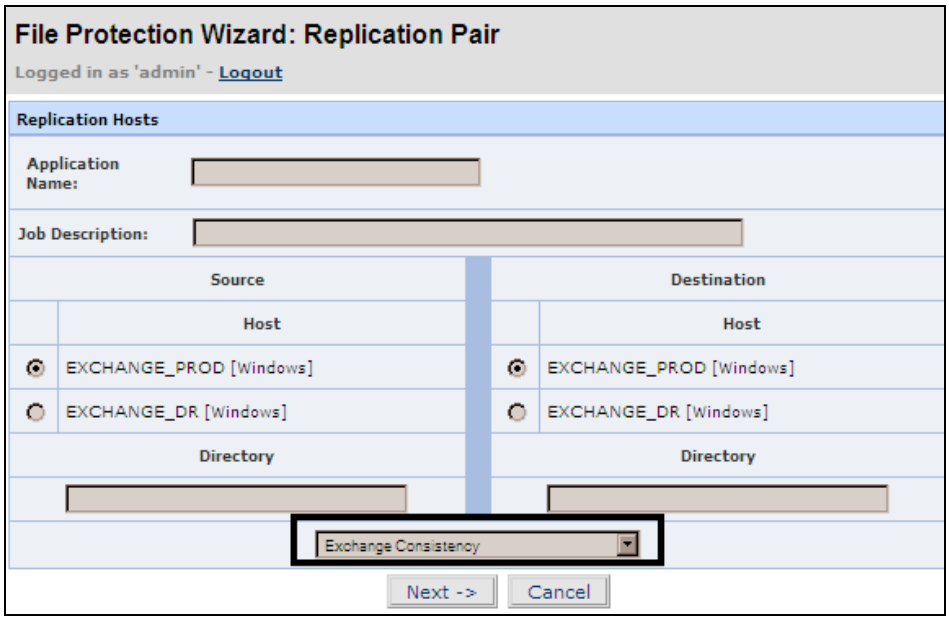


Figure 121

Notes:

For Exchange server 2007, select the FX template as "Exchange 2007 Consistency"

Step 103. The FX job options page opens up scroll down to click on "**Finish**" to complete the FX job configuration.

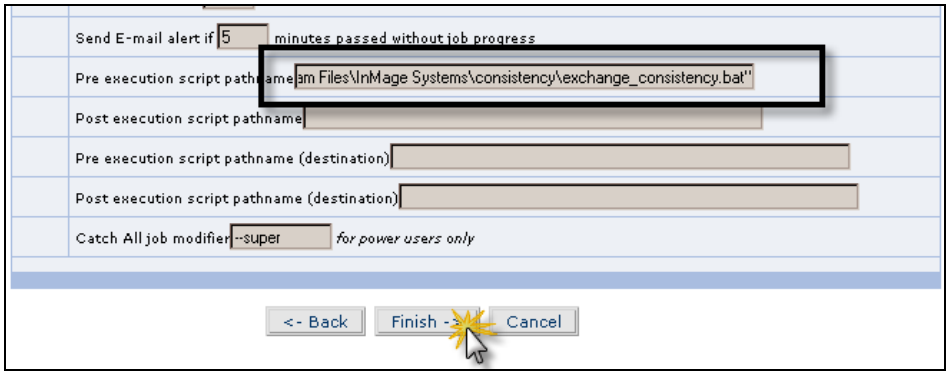


Figure 122

Step 104. You will be returned to the "**File Protection Group**", this time the "**Replication jobs**" contains the FX job configuration. Click on "**Set Schedule**".

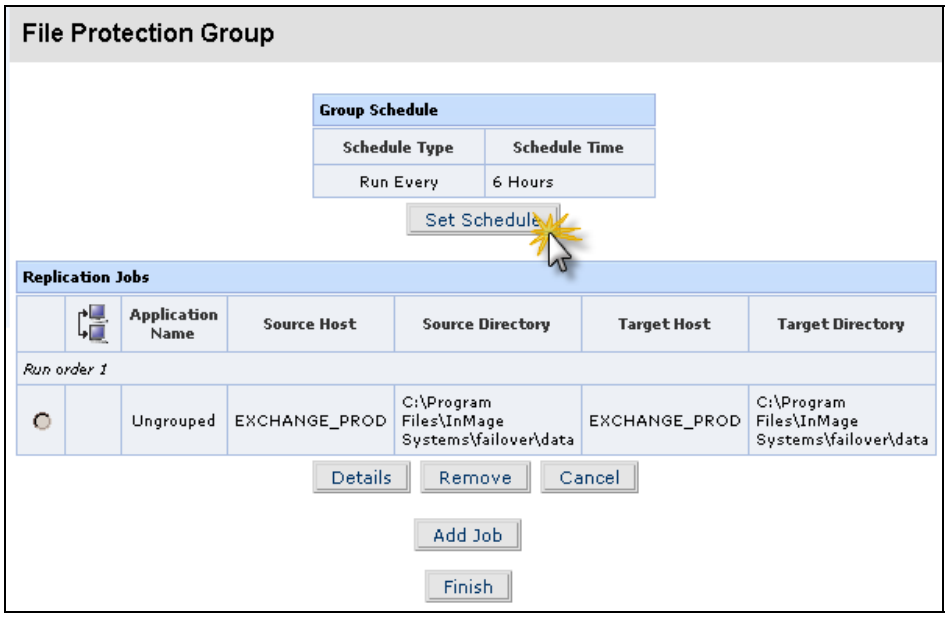


Figure 123

Step 105. The FX scheduler opens up, select "**Scheduled -> Run every**" then enter the frequency and click on "**Set Schedule**". For this example this FX job is set to execute every five minutes.

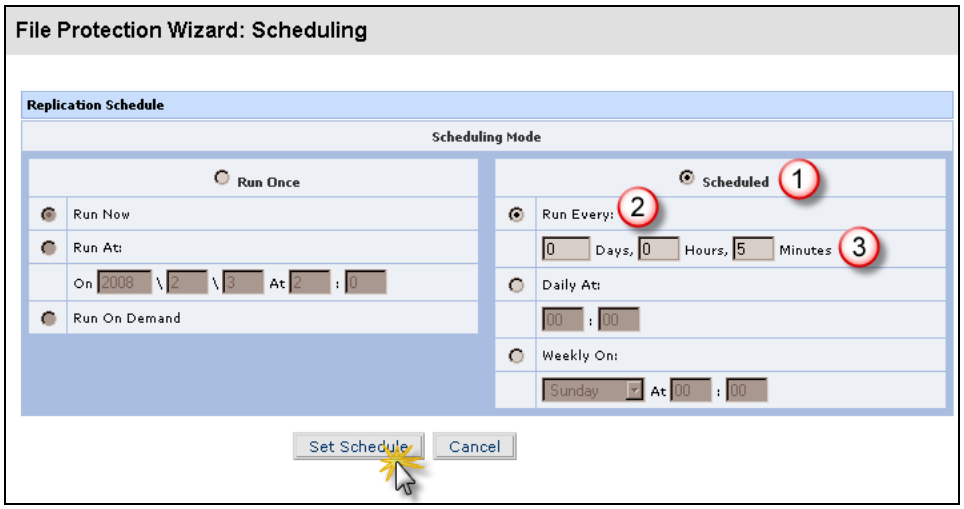


Figure 124

Step 106. You will again return to the "**File Protection Group**" screen, click on "**Finish"** to save the job configuration

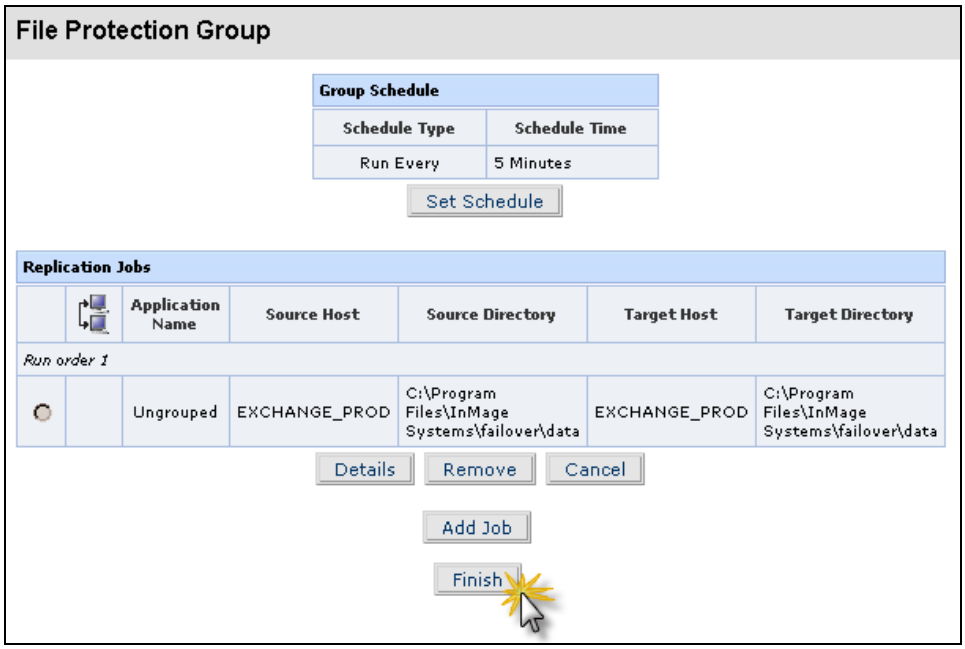


Figure 125

Step 107. The "**Protection Status**" also shows the FX job replication status under "**File Protection Status".** This is where you can monitor if the FX job executed normally or exited with an error.

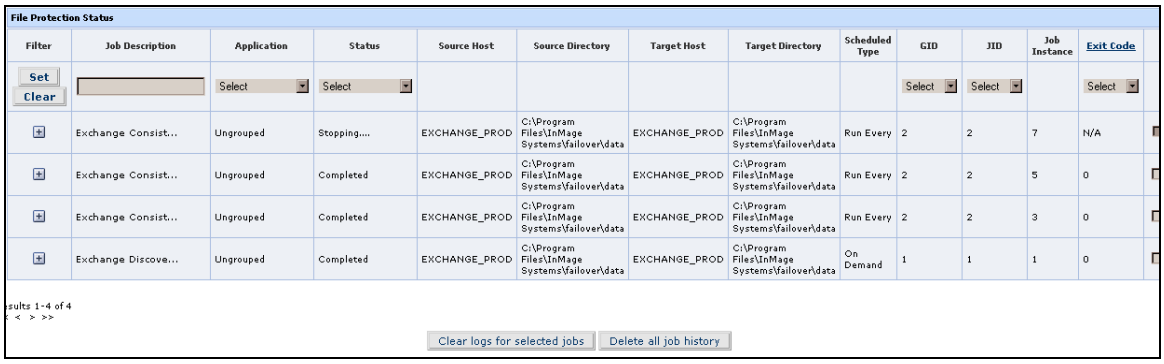


Figure 126

Notes:

The volume replication is continuous while the FX job for exchange consistency is scheduled to run at regular intervals.

5.1.3.2 Through CLI

You may also issue consistency tags through command line interface using the vacp.exe under the VX agent installation path.

To issue consistency tags on Exchange 2003

`vacp -a exchange -t "<`*name of the tag*`>`

```
C:\Program Files\InMage Systems>vacp -a exchange -t "Tag_1"
Parsing command line arguments ....
Validating command line arguments ...
```

Figure 127

To issue consistency tags on Exchange 2007

`vacp -w ExchangeIS -t "<`*Name of the tag***`>"`**

```
C:\Program Files (x86)\InMage Systems>vacp -w ExchangeIS -t "tag_1"
Parsing command line arguments ....
Validating command line arguments ...
Generating Tag: ExchangeIS48d7556b
Generating Tag: tag_1
Generating Tag: FileSystem48d7556b
Generating "Revocation" tag ...
```

Figure 128

Notes:

"-a Exchange" is used for Exchange 2003
"-w ExchangeIS" is used for Exchange 2007

5.2 Protecting Exchange (DB and logs on different volumes)

Step 108. Considering that exchange data is usually spread over multiple volumes. The production server (**Exchange_PROD**) is configured such that the edb files (exchange database files) are stored on the F volume while the stm (streaming database files) are stored on the E volume for public folder store and mailbox store.

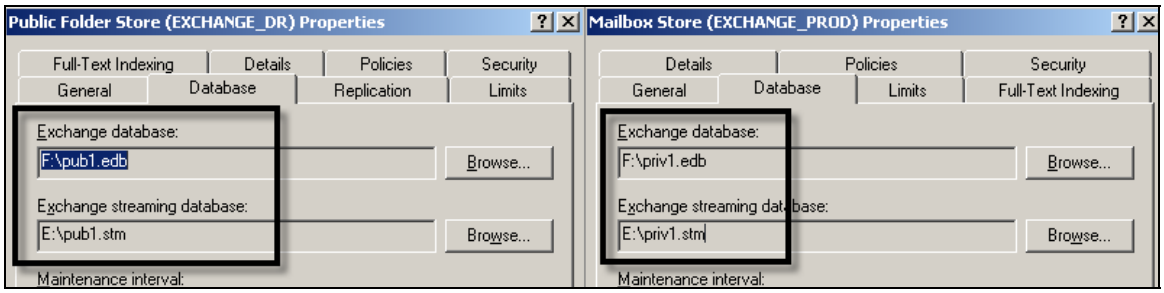


Figure 129:

Step 109. The same has to be done on the DR server (**Exchange_DR**) as well to maintain the same configuration

Step 110. A discovery job is executed to discover all the exchange volumes. To learn more about setting up discovery job, refer to section Discover Exchange volumes on page 65. A "**Volume Protection**" screen is shown in the below figure containing the new exchange volumes.

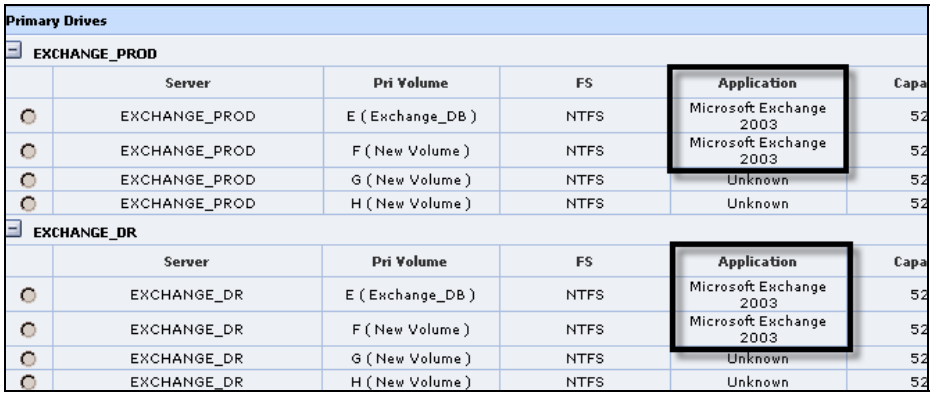


Figure 130:

5.2.1 Replicate discovered volumes

Step 111. Setup a VX replication pair from E: of the production server (**Exchange_prod**) to E: of the DR server (**Exchange_DR**). Then proceed to replicate the other volume(s) F: Click on "**Volume Protection",** expand the production server to select the next exchange volume then click on "**Start Replication"**

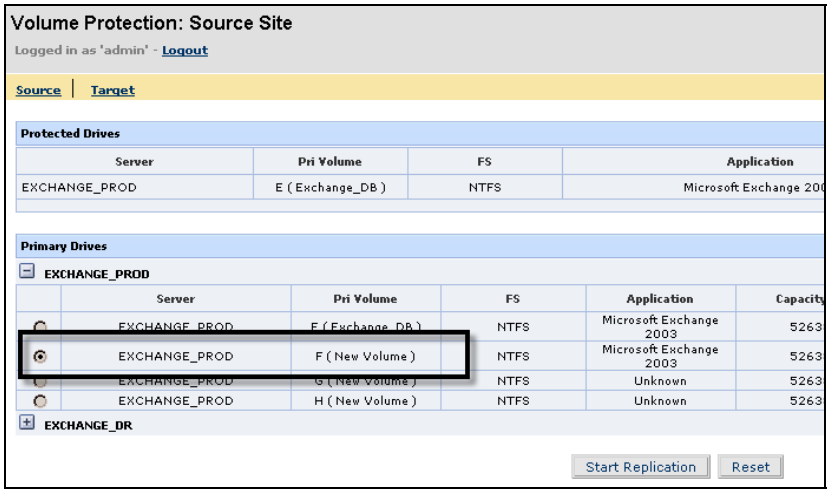


Figure 131:

Step 112. The target page opens up, expand the DR Exchange server, and select the target volume and then scroll down to set the replication options

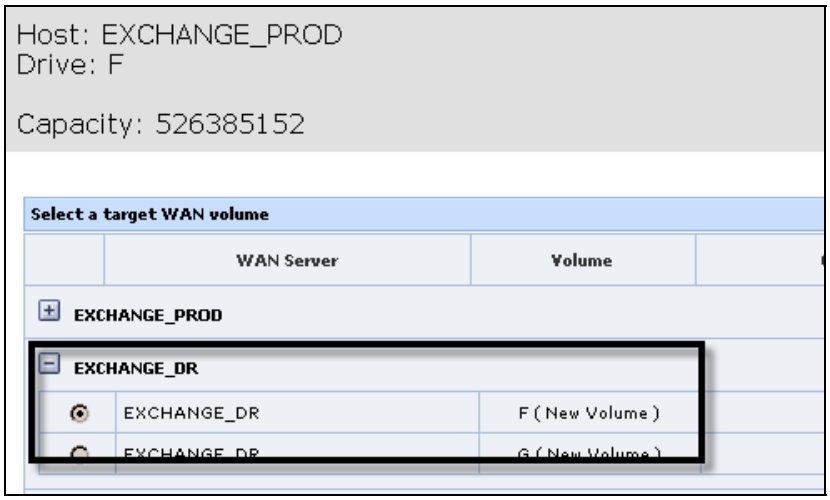


Figure 132:

Caution:

Ensure that you replicate the source volume to the same drive letter (or mount point) on the target host. For example E: to E:
Automated failover is not supported when source and target volumes have different drive mapping.

Step 113. Be sure that the "**Enable CDP retention option"** option is enabled then click on "**Submit**".

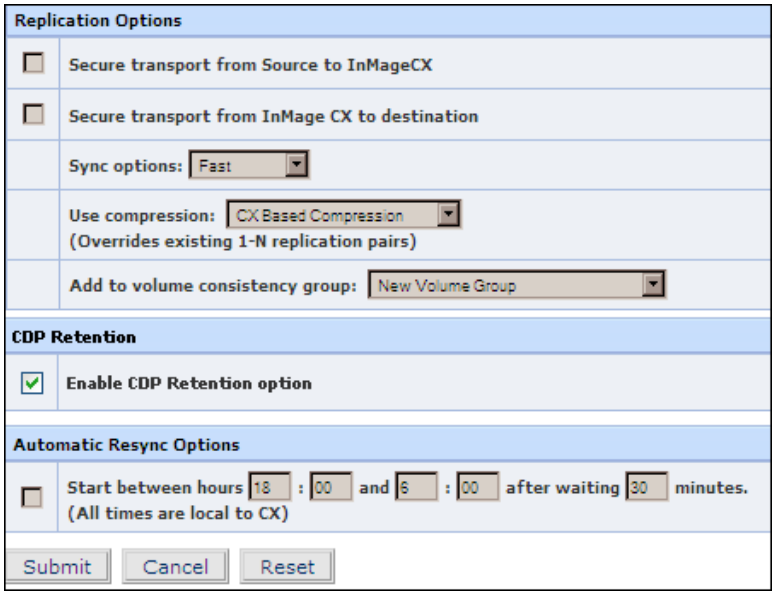


Figure 133

Step 114. Define the type of retention policy and start the replication. Click on the "**Protection Status**" to check the status of the replication pairs.

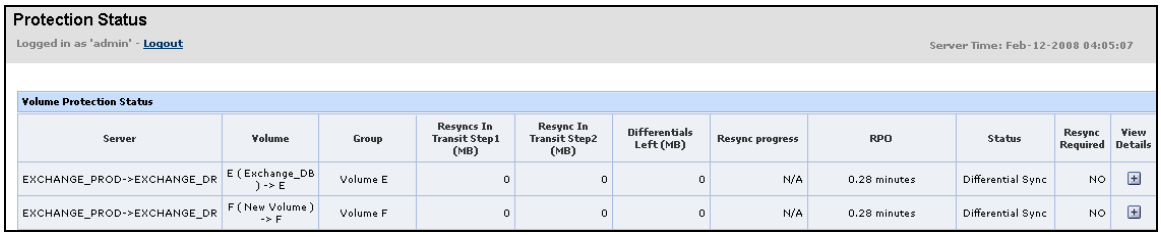


Figure 134:

Step 115. Proceed to issue consistency tags on the exchange volumes. To setup an exchange consistency job refer to the section Issue consistency tags on page 73.

Exchange failover and failback through the CX UI is similar as mentioned in the sections Exchange failover through the CX UI on page 82 and Exchange Failback through CX UI on page 88 respectively.

For console based failover and failback refer to the section Exchange failover and failback through CLI on page 96.

5.2.2 Before failover

Before failover, the production server (Exchange_prod) is fully functional. You may choose to check this through your email client or web based outlook.

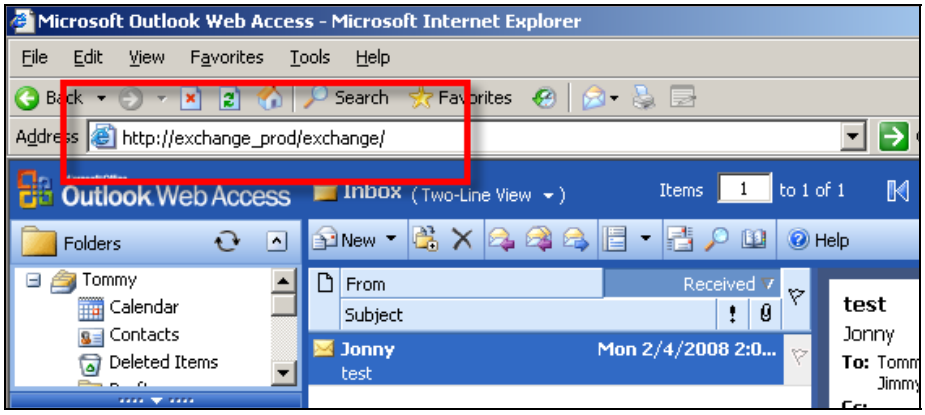


Figure 135

This concludes protecting standalone Exchange server. You may now proceed to perform a failover. Post failover you should be able to access your mailbox without any configuration changes from the client side.

6 Exchange failover through CX UI

6.1 Exchange Planned Failover

A planned failover can be performed through CXUI and also through the command line interface. To perform Exchange planned failover through CLI refer to the section Planned exchange failover on page 96.

Step 116. Click on "**File Protection**" then on "**New Job Group Wizard**"

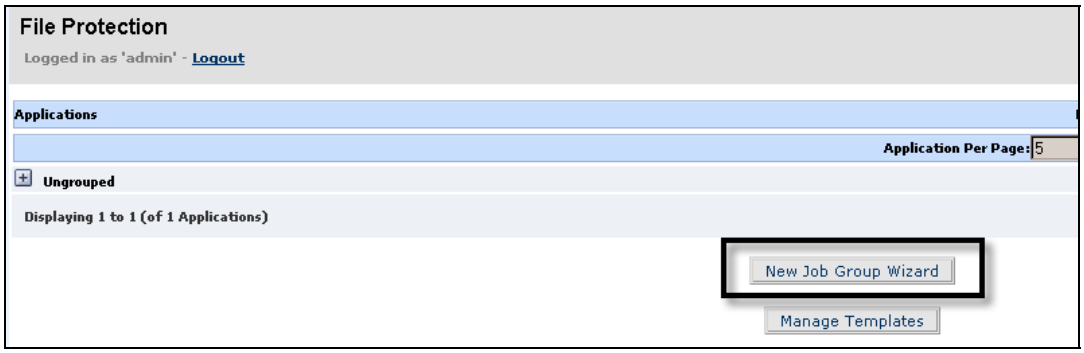


Figure 136

Step 117. Click on "**Add Job**"

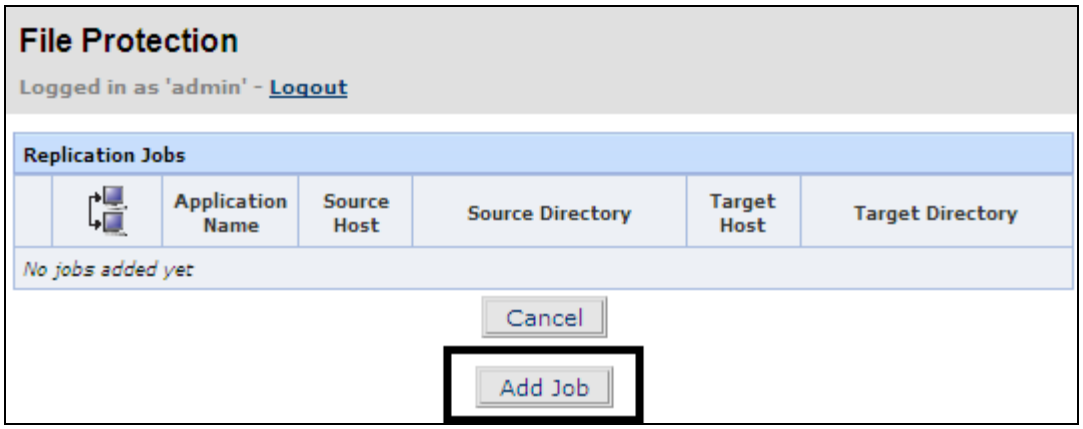


Figure 137

Step 118. Select the source as the production Exchange server and the destination as the DR Exchange server. Select the FX template as "**Exchange Planned Failover**" and click on "**Next".**

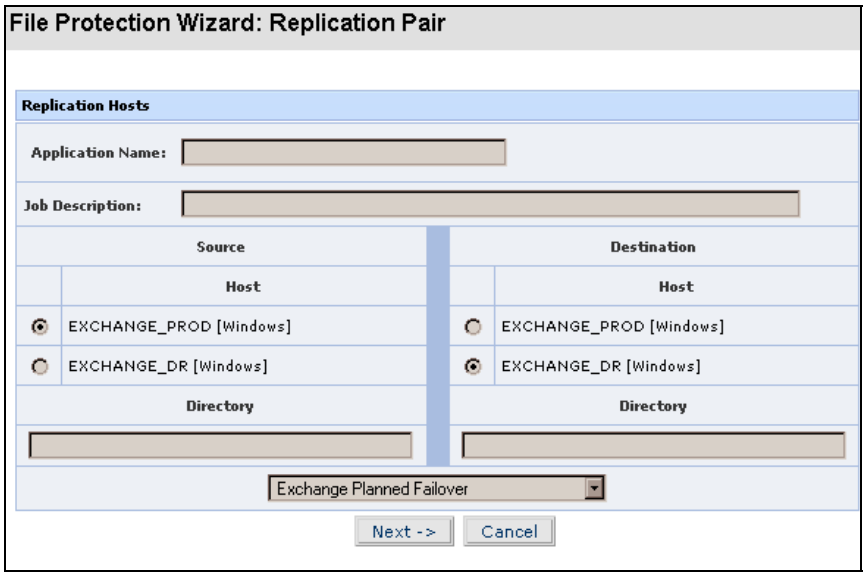


Figure 138

Notes:

For Exchange server 2007, select the FX template as "Exchange 2007 Planned Failover".
To perform AD replication, use the switch "–doadreplication" on the target post script.
To restrict DNS failover automatically use the switch "–nodnsfailover" on the target post script

Step 119. The FX "**Job Options"** open up with required fields filled up. Scroll down to "**Miscellaneous options"** to observe the source pre script and target post script are filled up by the template. Click on "**Finish"** to save the job configuration.

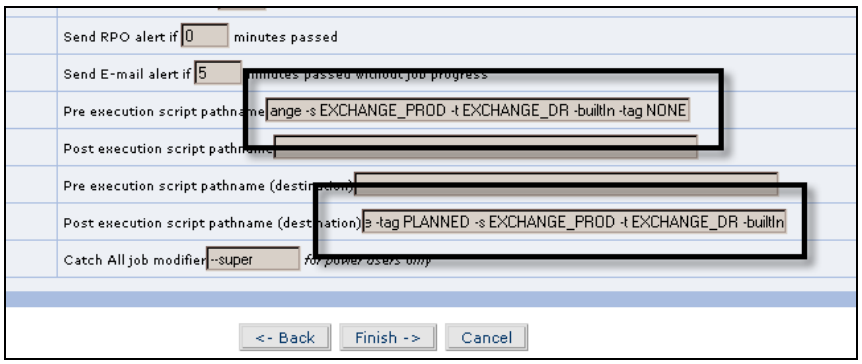


Figure 139

The prescript prepares the production exchange server for a failover and the target post script performs the failover to the consistency tag issues by the source prescript.

Step 120. You will return to the "**File Protection Group"** screen, the job will be scheduled to run **"On Demand**", click on "**Finish".**

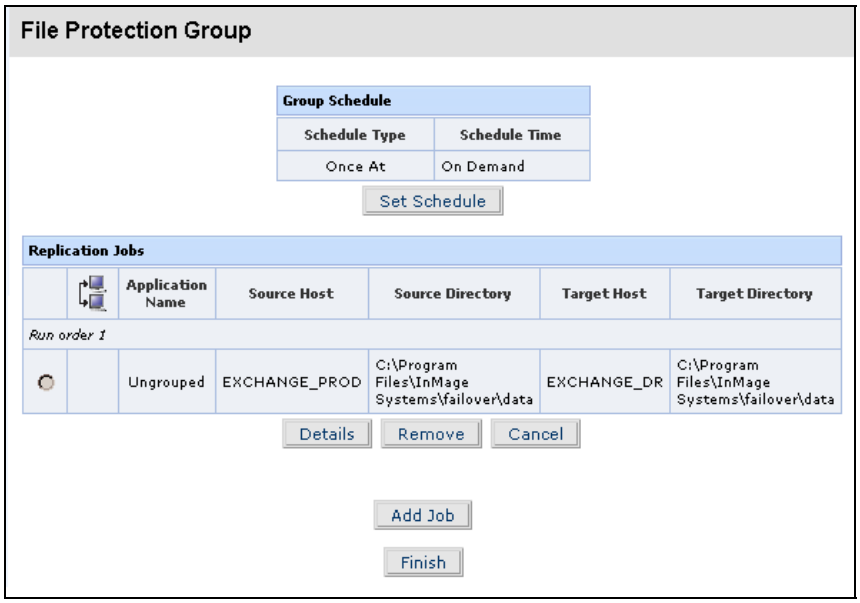


Figure 140

Step 121. Click on the "File Protection" to find the "Exchange planned failover" job.

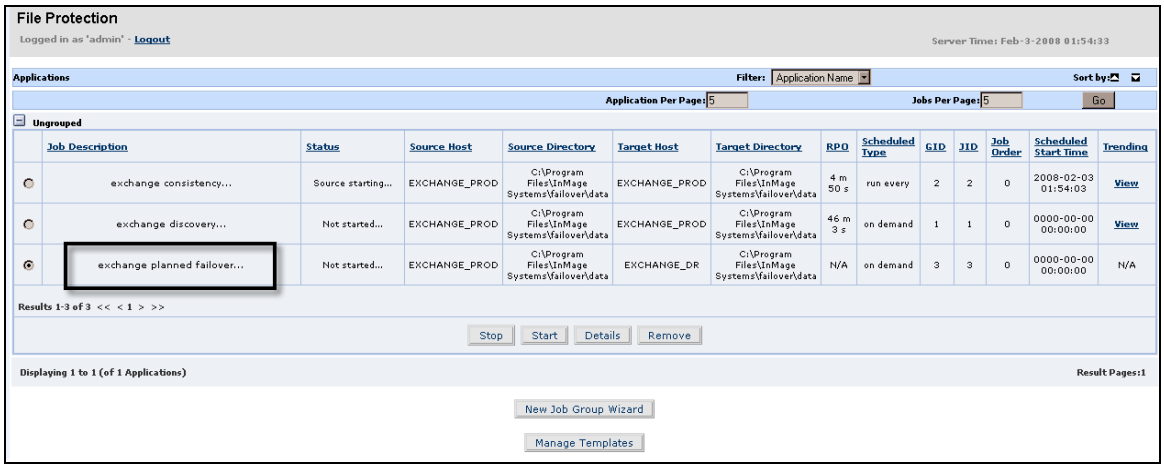


Figure 141

Step 122. To perform a planned failover, select the "**Exchange planned failover"** job and then click on "**Start**". This will break the Exchange VX replication pairs and roll them back to a consistent point.

6.2 Exchange Unplanned Failover

Step 123. Click on "**File Protection -> New Job Group Wizard -> Add Job**" to open up the "**File Protection Wizard: Replication Pair**".

Step 124. Select the source and destination as the Exchange DR server. Then select the FX template as "**Exchange Unplanned Failover**" and click on "**Next".**

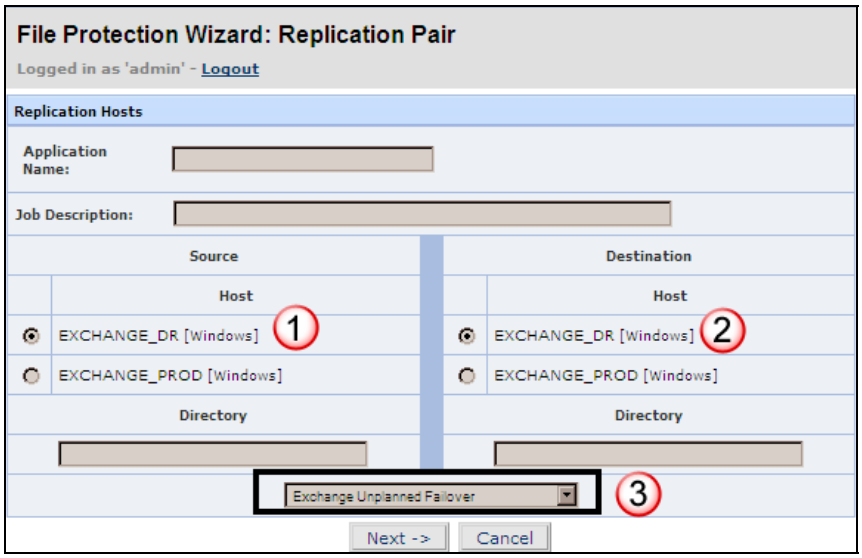


Figure 142

Step 125. The next screen opens up. Scroll down to the "**Miscellaneous Options"** to change the target post script command. Edit the –S switch to reflect **–s<name of the production Exchange server>**

Step 126. The job will be set to run **"On Demand".** Start the job to perform an unplanned failover.

Step 127. To perform Exchange unplanned failover through CLI, refer to the section Unplanned exchange failover on page 85

Step 128. To retain the replication pairs on the CX UI, use the "**–audit"** switch. This will unhide all the target volumes in read write mode and roll them back to the latest consistent point. This is preferred when you want to avoid setting replication pairs again. All older retention logs and data are lost.

Notes:

Ensure that Exchange discovery is performed (post VX replication) before going ahead with Exchange unplanned failover.
For Exchange server 2007, select the FX template as "Exchange 2007 Unplanned Failover".
Since the production server is considered to be down, selecting the source and target as the DR Exchange server.

Caution:

Unplanned failover is performed when the production server is unreachable, so by selecting the DR server as the source and destination ensures that the job completes even while the production server is unreachable

6.3 Exchange failover (W/O CDP retention)

If the VX replication is set without the "**CDP retention**" option, then to failover the exchange server select the FX template as "**Exchange Failover without Retention**".

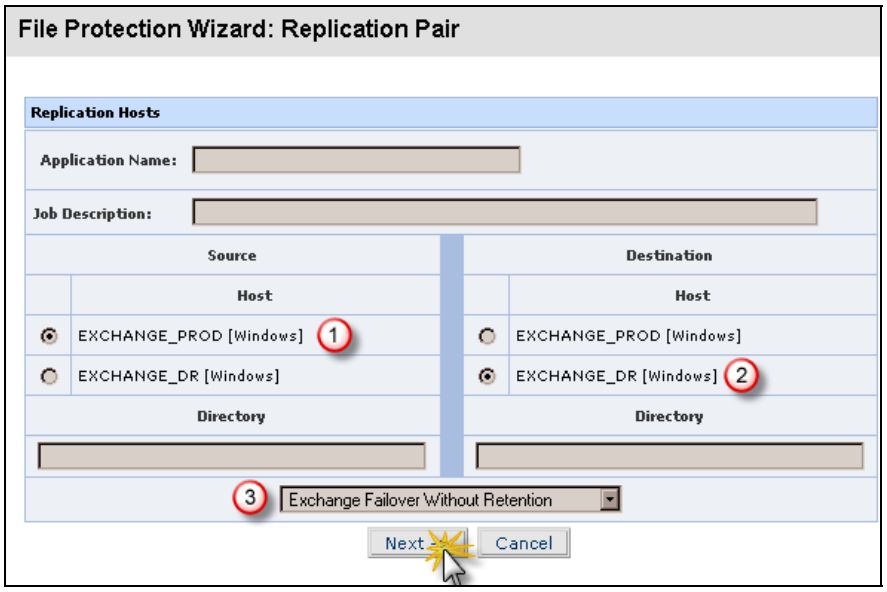


Figure 143:

You may also perform this through CLI; refer the section Exchange failover (Without retention) on page 98

Notes:

For Exchange 2007 replication pairs without CDP retention, select the FX template as "Exchange 2007 Failover without Retention" for failover.

While performing a failover on a replication pair without CDP retention, the target volume is unlocked in read write mode and the exchange services are started on the target.

Ensure that the production server's host name is not "Exchange", else failover exits with an error code of 32

6.4 After Failover

After a failover is performed, users accessing the production server will be diverted to the backup server.

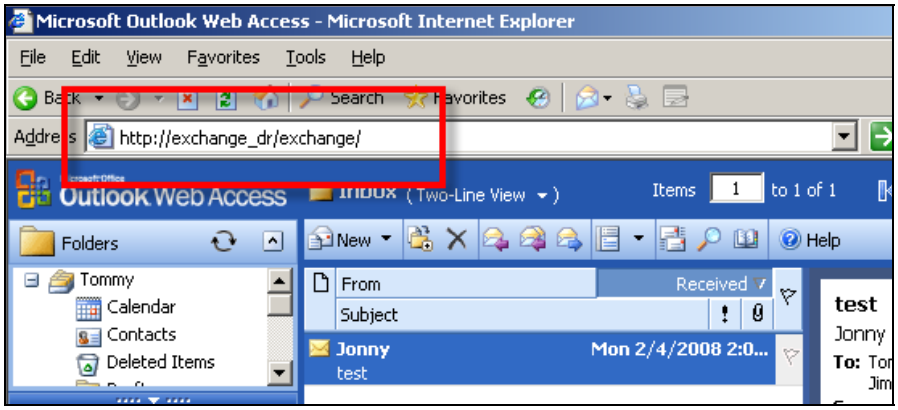


Figure 144

The backup server will serve to all user requests and email transactions continue normally. All these operations occur while the production exchange server is down. Once the production server is online, a failback may be initiated.

Notes:

Post failover, discovery and consistency jobs are scheduled to "Run on Demand".

7 Exchange Failback through CX UI

Exchange failback is performed in three steps

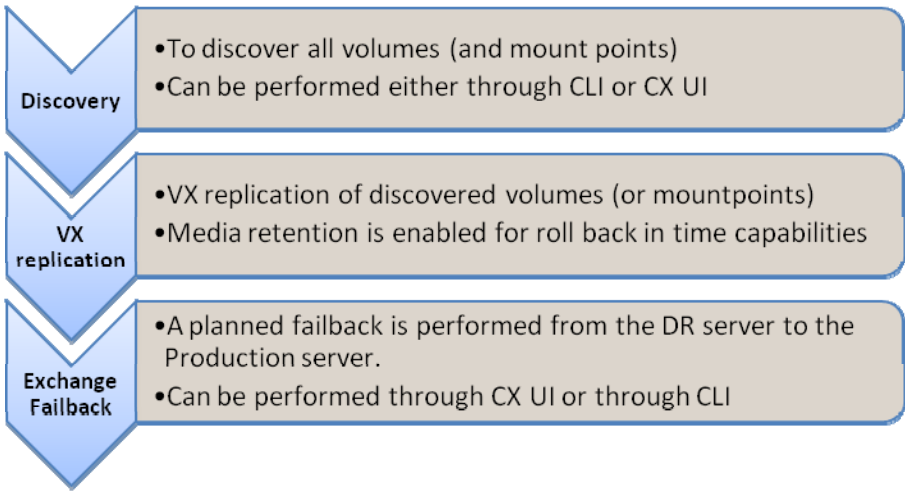


Figure 145

Discovery

This is the first step to be performed in a failback. The discovery job ensures that all the Exchange configuration changes on the DR server (post failover) are applied to the production Exchange server.

Reverse replication

A reverse replication is set from the DR Exchange server to the production server to ensure that the latest data is maintained across both servers.

Exchange Failback

Exchange planned failback is performed from the DR Exchange server to the production Exchange server. This can be performed either through CX UI or through CLI.

7.1 Discovery

Step 129. Open the CX UI and click on "**File Replication –> New Job Group Wizard -> Add Job**" Then select the "**source"** and the Exchange production server and "**destination"** as the Exchange DR server. Select the FX template as Exchange Discovery and click on "**Next".**

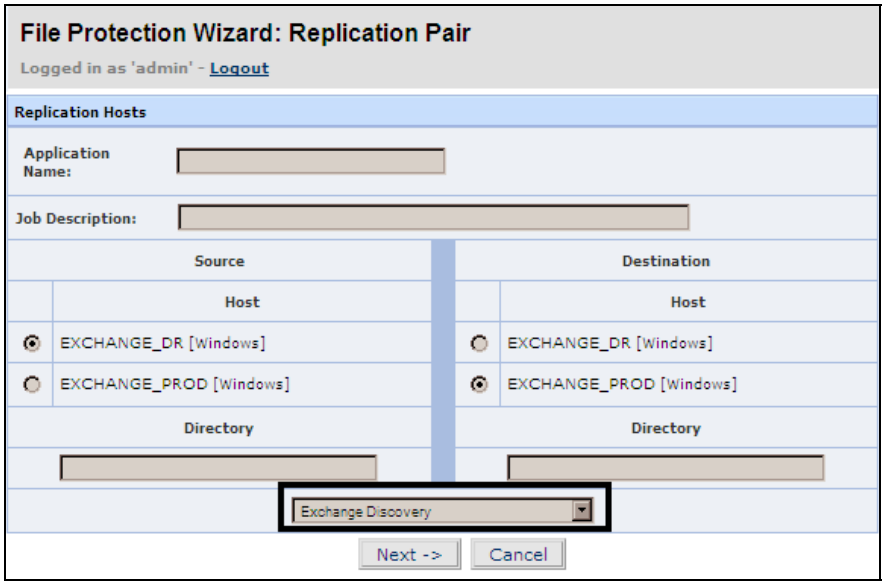


Figure 146

Step 130. The "**Job Options**", screen opens up with all the required fields filled up automatically including the target post script. Click on "**Finish"** to continue to the next screen. Then save the job.

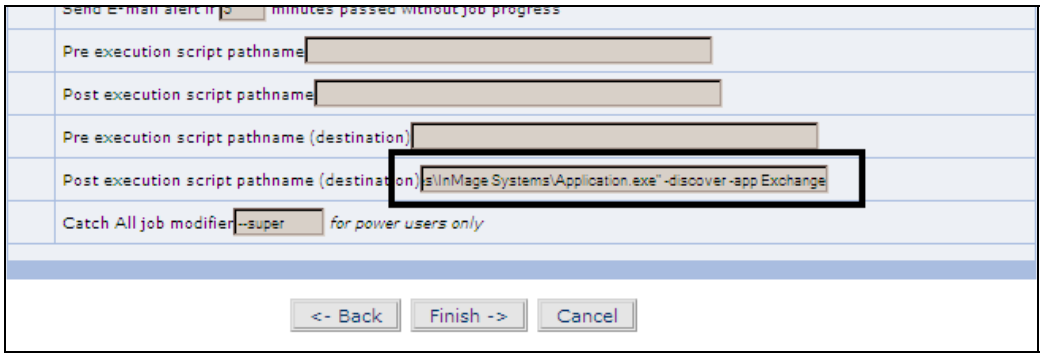


Figure 147

Step 131. Start the Discovery job and proceed to the next step once discovery completes

7.2 Setting a reverse replication

A reverse replication is set to update the production exchange server (original source) with all the data changes during the outage. All exchange volumes are replicated to back to the production exchange server.

Step 132. Click on "**Volume Protection**", expand the host (previously the target host) and select the exchange volume and click on "**Start Replication".**

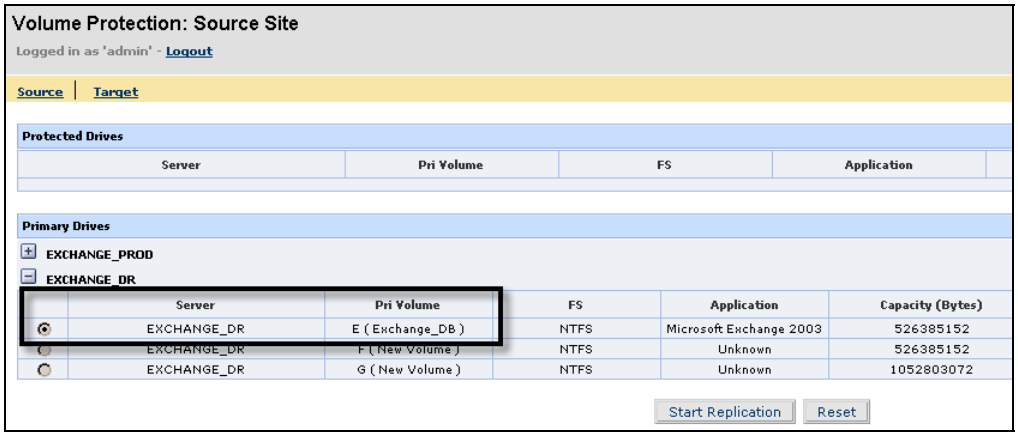


Figure 148

Step 133. Expand the target host (previously source exchange server) and select the exchange volume and scroll down to set the "**Replication options".**

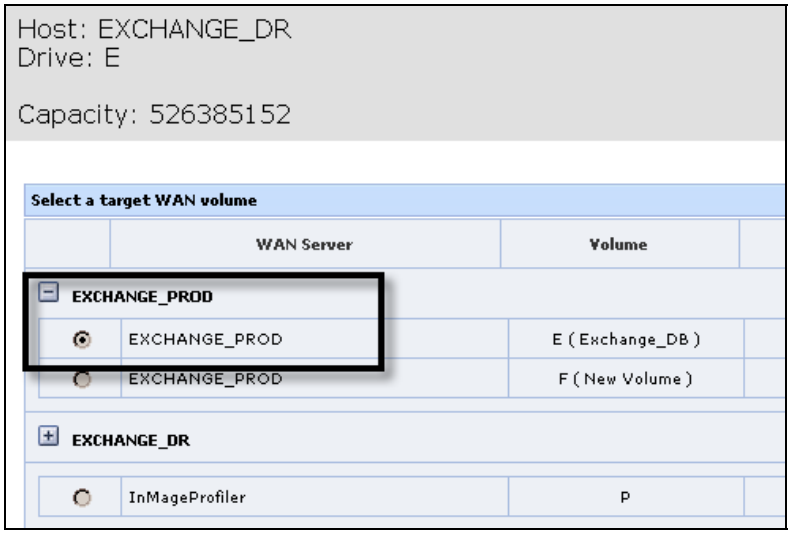


Figure 149

Step 134. Ensure that "**Enable CDP Retention option**" is enabled while other features are optional. Click on "**Submit**". The rest of the options are optional.

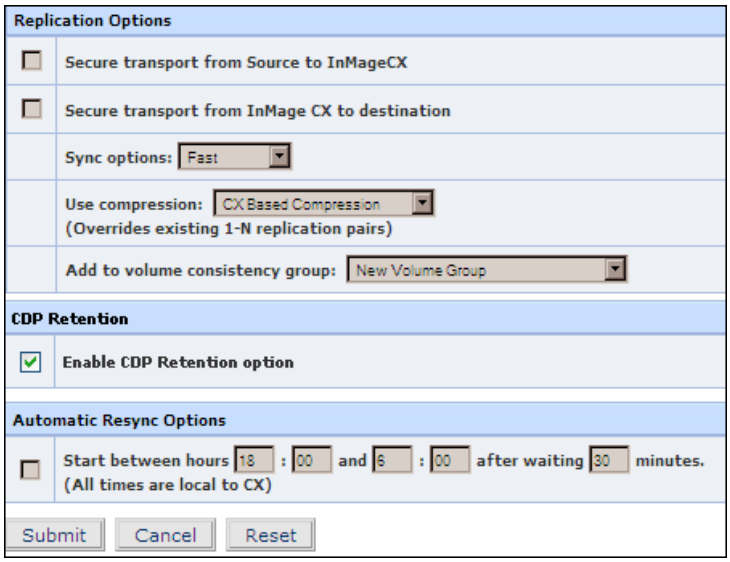


Figure 150

Step 135. The last screen opens up where the type of retention policy is to be defined. Enter accordingly and click on "**Submit**" to start the replication.

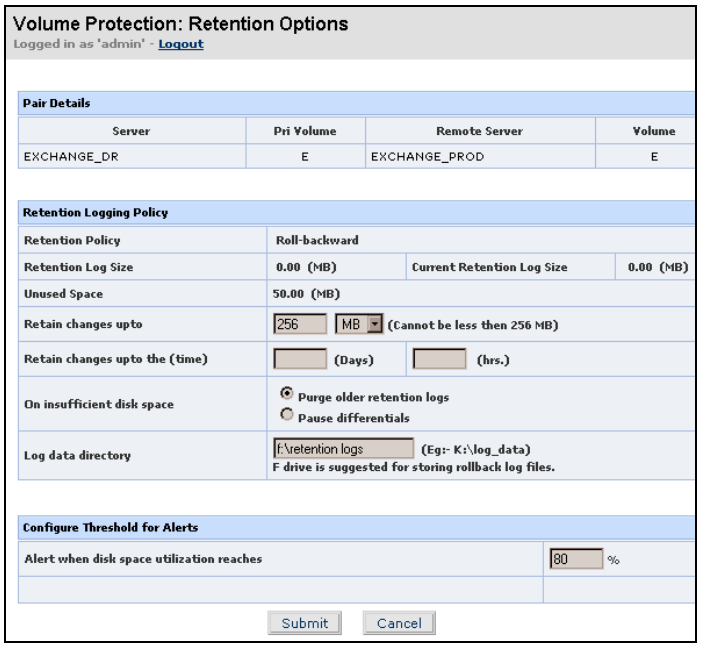


Figure 151

Notes:

By default 256 MB is left free on the retention volume. You may choose to reduce this free space limit through "System -> Agent Settings -> Retention Reserve Space Settings" to reduce the "Unused space" on retention volume

7.3 FX job for failback

After the reverse replication reaches "**Differential Sync"** the production exchange server is updated with all the data changes occurred during its outage. Now performing a failback to the production Exchange server ensures little or no data loss. To perform a failback through CLI, refer to the section Exchange Failback on page 99.

Step 136. Open the CX UI, click on "**File Protection**", then click on "**New Job Group Wizard**"

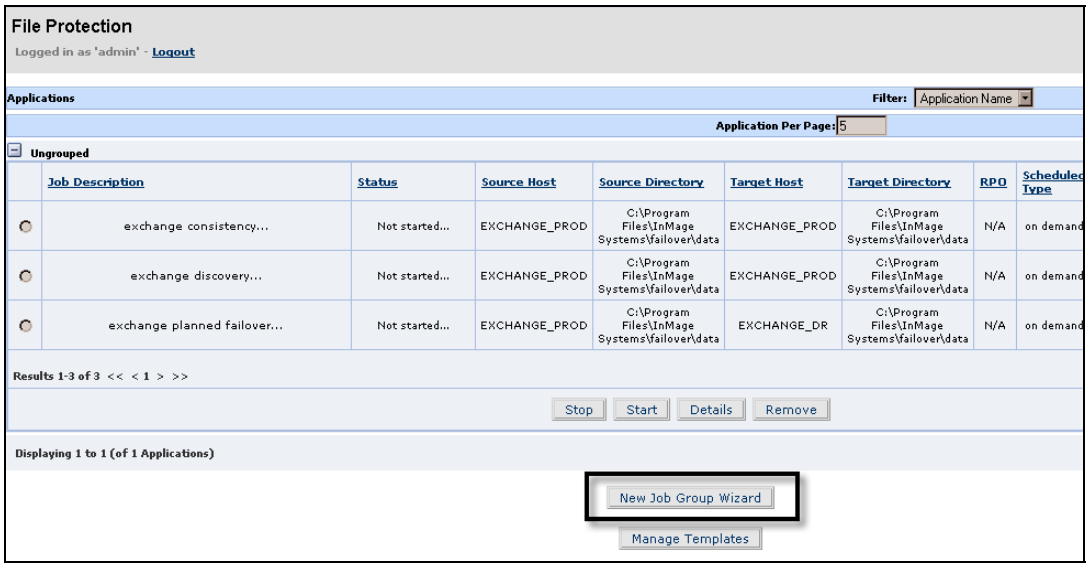


Figure 152

Step 137. Click on "**Add Job**".

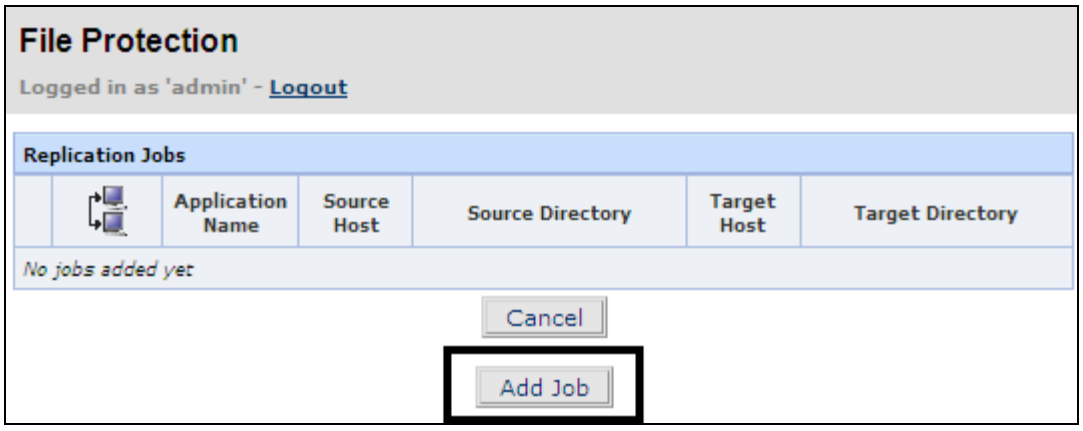


Figure 153

Step 138. Select the DR exchange server as source and the production exchange as the destination, then select the FX template as "**Exchange Planned Failover**" and click on "**Next".**

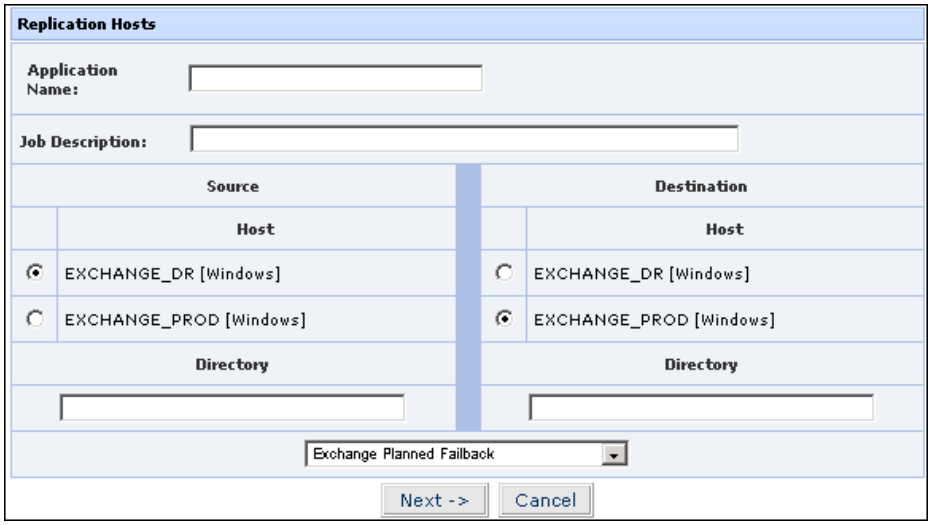


Figure 154

Notes:

For Exchange 2007 use the template "Exchange 2007 Planned Failback"

To perform AD replication, use the switch "–doadreplication" on the target post script.

To restrict DNS failover automatically use the switch "–nodnsfailover" on the target post script

Step 139. The "**Job options"** page opens up, scroll down and click on "**Finish"** to complete the FX configuration.

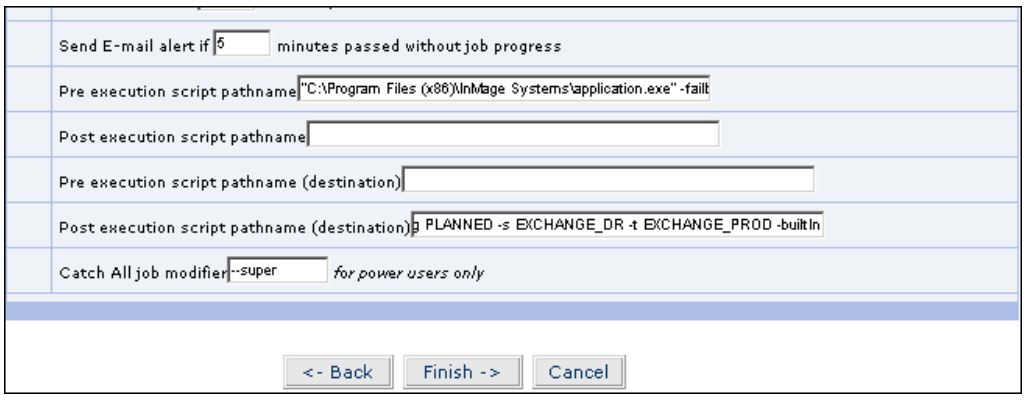


Figure 155

Step 140. You will be returned to the "**File Protection Group".** Click on "**Finish**" to save the job.

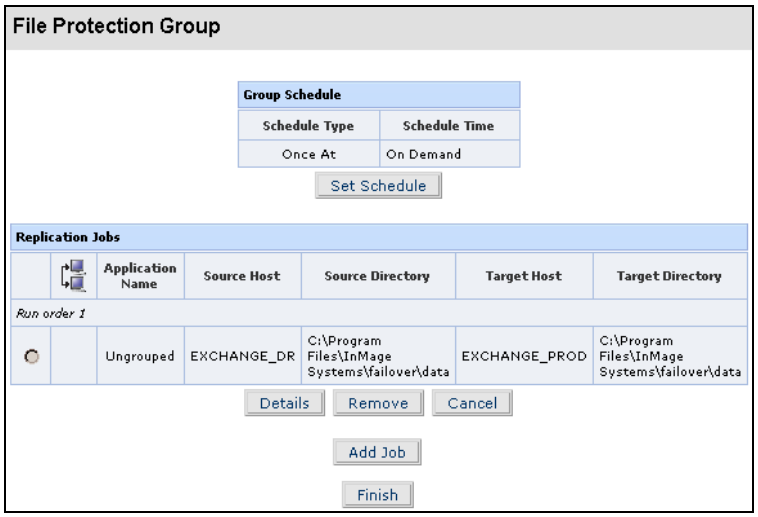


Figure 156

Step 141. Click on "**File Protection"** to find the newly created FX job. To perform a failback to the Production server, select the job and click on "**Start**".

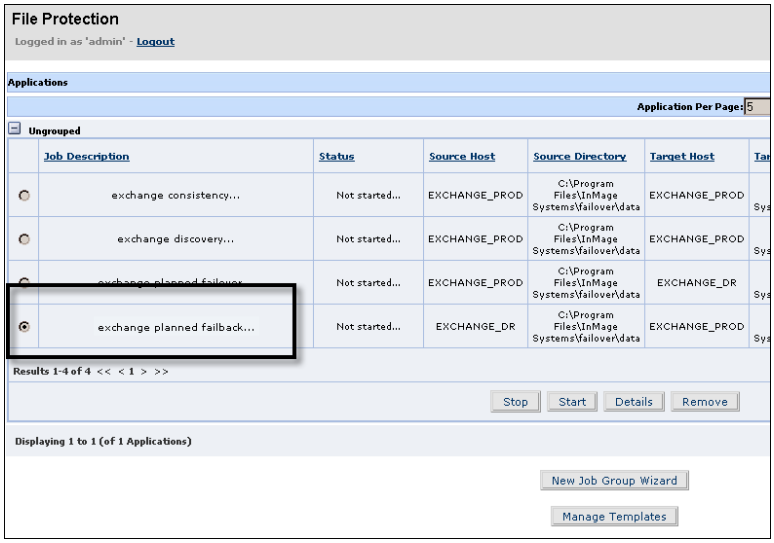


Figure 157

Step 142. The status of the failback can be monitored under "**Protection Status -> File Protection Status".**

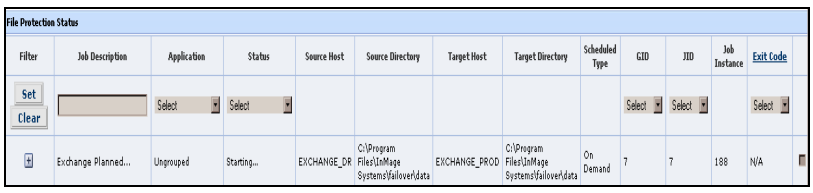


Figure 158

7.4 After failback

After a failback, the production server is back online. This is a transparent process for the end users and you should be able to access your mail box without any client side configuration changes.

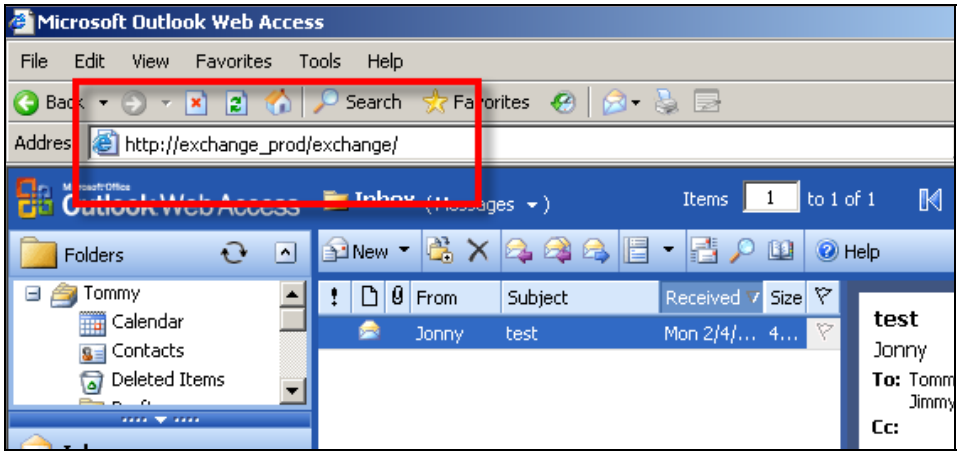


Figure 159

8 Exchange failover and failback through CLI

8.1 Exchange Failover

8.1.1 Planned exchange failover

A planned failover can be performed through the command line interface as well. Since planned failover involves preparing the production exchange server before actually failing over.

Step 143. Switch to the production exchange server's console (the active node incase of cluster environment) and navigate to the VX agent installation path. In this example the installation path is "**C:\Program files\InMage Systems**". The command application.exe is used to prepare the production server.

The syntax of the command is
`Application.exe –failover –planned –app Exchange -s` *<Name of the production exchange server>* **`-t`** *<name of the backup exchange server>* **`-builtin –tag NONE`**

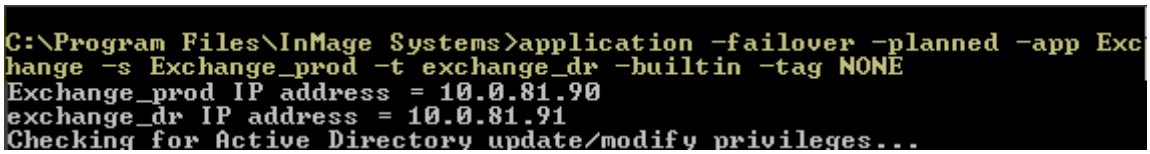


Figure 160:

The result of the command is displayed as "**important information**".

The syntax of the command is

`Application –failover –planned –app exchange –s` *<production exchange sever name>* **`-t`** *<backup exchange server name>* **`-builtin –tag`** *<tag name as given by step1>*

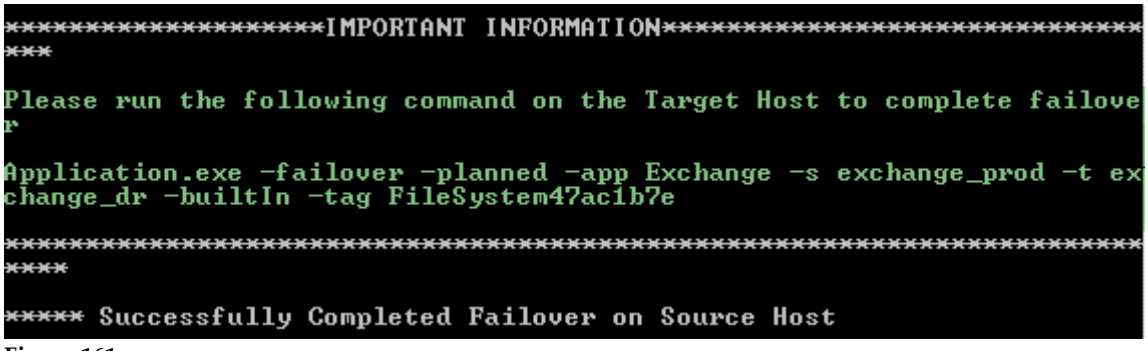


Figure 161:

Step 144. Execute the command on the backup exchange server to complete a planned failover through the command line interface.

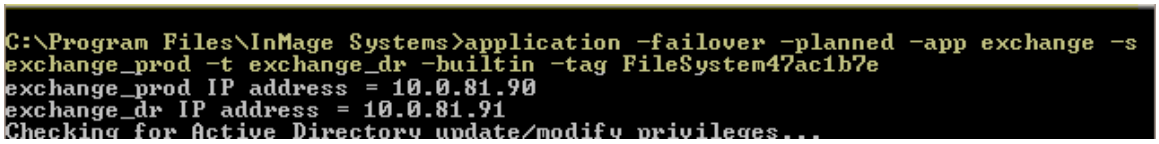


Figure 162:

Notes:

To failover to an application tag or user defined consistency tag, append the command with –tag <name of the tag> -tagtype <type of the tag>.

The tagtype for exchange 2003 is Exchange and for exchange 2007 it is Exchange2007.

The tag type for user defined tag is USERDEFINED.

The name of tag given should belong to the type of the tag specified.

If the tagtype is not mentioned, by default the FS tagtype is considered

8.1.2 Unplanned exchange failover

Exchange Discovery is to be performed at least once after VX replication before performing an unplanned Exchange failover.

An unplanned failover is performed on the DR exchange server (target host) console. The syntax of the command is

`Application –failover –unplanned –app exchange –s <`*Production exchange server name***`> -t <`***Backup exchange server name***`> -builtin –tag latest`**

Figure 163:

8.1.3 Exchange failover (Without retention)

Since **"CDP retention"** option is not enabled, the target volume cannot be rolled back, hence the target volume is unlocked in read write mode and the exchange server is failed over with the same command issued on the DR exchange server. The syntax is

`Application –failover –unplanned –app exchange –s <`*production exchange server name***`> -t <`***DR exchange server name***`> -builtin –tag none`**

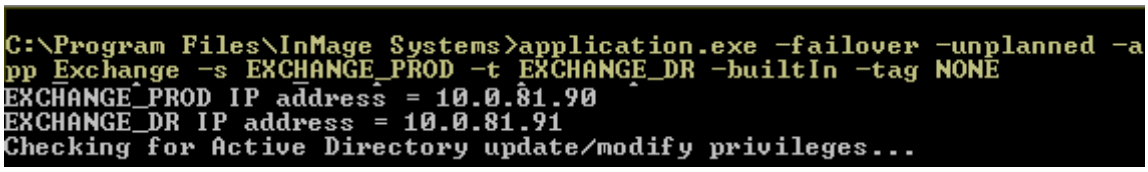


Figure 164:

8.2 Exchange Failback

8.2.1 Failback with CDP retention

Step 145. Access the DR exchange server console (which is acting in place of the production exchange server) then issue the command shown in the picture below. The syntax of the command is

`Application –failover –planned –app exchange –s <`*DR exchange server*`> -t <`*Production exchange server*`> -builtin –tag none`

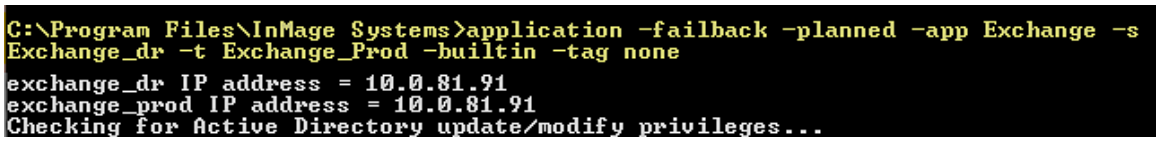


Figure 165:

The result of the command will be displayed under "**important information**". This is the command that has to be executed on the production server to complete the failback.

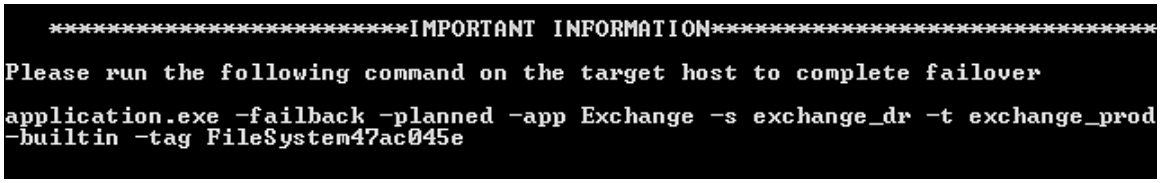


Figure 166:

Step 146. Switch to the production exchange server's console and issue the command to complete the failback.

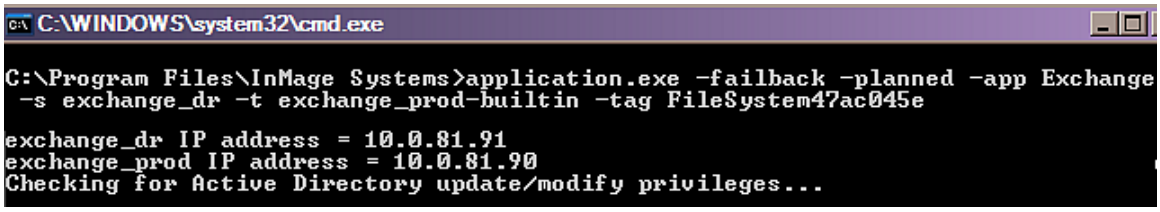


Figure 167:

9 Failover and failback using crash consistency tag

In normal setup, DR scout uses VSS snapshot to issue application or consistency tag but in a setup it is not possible to issue VSS consistency tag. In this case, crash consistency tag can be used and the same can be used for failover and failback. When crash consistency tag is used it always generates USERDEFINED tag. It will not generate any filesystem or application consistency tag.

9.1 Discovery

Use the application discovery template as used in planned failover. No changes are required.

9.2 Consistency

To set crash consistency FX job use the Exchange**xxxx_consistency_fstag.bat** file and pass the required argument as given below.

Syntax:

```
Exchangexxxx_consistency_fstag.bat "List of volumes separated by
semicolon" -CrashConsistency
```

For example, Exchange 2003 has mailbox and storage groups in G, H, K:\Mnt1, J:\Mnt2 volumes. Use the following command in prescript to set the crashconsistency job or run it through CLI.

```
"C:\Program Files (x86)\InMage
Systems\consistency\Exchange_consistency_fstag.bat”
"G:;H:;K:\Mnt1;J:\Mnt2" –CrashConsistency
```

Notes:

List of volumes must be in double quotes else only first Drive or mount point is taken for issuing tag.

-Crashconsitency can be written with or without double quotes

9.3 Planned Failover

9.3.1 Planned failover through CX UI

When you set a planned failover job, add the prescript with "**–crashconsistency**" and postscript with-"**-tagtype USERDEFINED**"

For example,

Pre script: "C:\Program Files (x86)\InMage Systems\application.exe" -failover -planned -app Exchange -s W2K3-SRC -t W2K3-TGT -builtIn -tag NONE **-CrashConsistency**

Post script: "C:\Program Files (x86)\InMage Systems\application.exe" -failover -planned -app Exchange -s W2K3-SRC -t W2K3-TGT -builtIn -tag PLANNED **-tagtype USERDEFINED**

9.3.2 Planned Failover through CLI

When you run through CLI follow the same procedure as in Planned exchange failover on page 96. The only change is add "**–crashconsistency**" switch to the source command and target command with"**-tagtype USERDEFINED**".

Source Command:
"C:\Program Files (x86)\InMage Systems\application.exe" -failover -planned -app Exchange -s W2K3-SRC -t W2K3-TGT -builtIn -tag NONE **-CrashConsistency**

Target command:
"C:\Program Files (x86)\InMage Systems\application.exe" -failover -planned -app Exchange -s W2K3-SRC -t W2K3-TGT -builtIn -tag <User Defined Tag> **-tagtype USERDEFINED**

9.4 Failback

9.4.1 Failback through CX

Use the same failback template as in section 8.2.4. The only change is add "**–crashconsistency**" switch to the source command and target command with "**-tagtype USERDEFINED**".

For example,
Pre script: "C:\Program Files (x86)\InMage Systems\application.exe" -failback -planned -app Exchange -s W2K3-TGT t W2K3-SRC -builtIn -tag NONE **-CrashConsistency**

Post script: "C:\Program Files (x86)\InMage Systems\application.exe" - failback -planned -app Exchange -s W2K3-TGT -t W2K3-SRC -builtIn -tag PLANNED **-tagtype USERDEFINED**

9.4.2 Failback through CLI

When you run through CLI follow the same procedure as in section 8.2.4.
The only change is add "**–crashconsistency**" switch to the source command and target command with "**-tagtype USERDEFINED**".

Source command:
"C:\Program Files (x86)\InMage Systems\application.exe" - failback -planned -app Exchange -s W2K3-TGT -t W2K3-SRC -builtIn -tag NONE **-CrashConsistency**

Target command:
"C:\Program Files (x86)\InMage Systems\application.exe" - failback -planned -app Exchange -s W2K3-TGT -t W2K3-SRC -builtIn -tag <User Defined Tag> **-tagtype USERDEFINED**

9.5 Unplanned Failover

When you set the unplanned failover job, in the unplanned failover template, add the postscript with-"**-tagtype USERDEFINED**". The same can be used for the CLI

For example,
"C:\Program Files (x86)\InMage Systems>application.exe -failover -unplanned -app exchange -s W2K3-SRC –t W2K3-TGT -builtIn -tag LATEST **-tagtype USERDEFINED"**

Part 2 Active/Passive Clustered Production Server and Standalone DR Server

This part explains replicating a clustered production Exchange server to a standalone DR server. This part contains four major sections

Prepare: This section explains steps to be taken before deploying Scout to backup a Clustered Exchange server (with one active node and one passive node) to a standalone Exchange server.

Protect: This section consists of three sub sections Discovery, VX replication, and consistency.

Failover: Planned and unplanned failover are both explained through CX UI and CLI.

Failback: Failback from a non-clustered Exchange server to a clustered Exchange server is described in detail.

10 Preparing for deployment

Similar to a non clustered environment, a discovery job is run to probe for exchange volumes. However, before proceeding with the discovery job, there are a couple of registry values that need to be altered manually on each of the cluster node.

The registry value "**UseConfiguredIP**" should be set to decimal 3255. Another registry value "**ConfiguredIP**" should be set to the public IP address, since the private IP address will be internally used for clustering. Both registry values are under "**HKEY_LOCAL_MACHINE\SOFTWARE\SV Systems\FileReplicationAgent**"

Once the values are set, restart the FX agent service on the corresponding node to enable the FX agent to pick up the new settings.

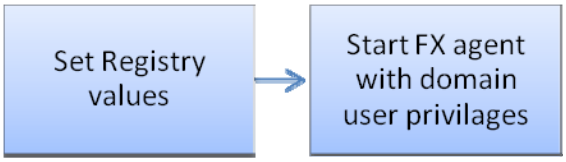


Figure 168:

In this part of the document EXCLUSTER1 and EXCLUSTER2 are cluster nodes while EXDRSERVER is used as a backup exchange server. The names of these servers will differ with those in your production environment.

Step 147. **Set the registry values**: This can be done through the registry editor ("**regedit.exe**")

Step 148. **Restart the FX agent service**: Once the registry values are set restart the FX agent service ("**services.msc**")

Caution:

Ensure that the FX agent service is started with domain administrator privileges.
Failing to set the registry values results in exit code 10 for FX jobs.

11 Protect Clustered Exchange server (Cluster environment)

This part of the document is valid for a two node cluster with one active and one passive node. Protecting Exchange is divided into four sections as shown below

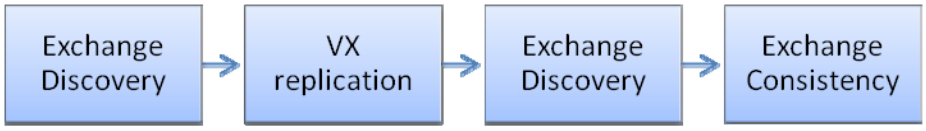


Figure 169

Exchange Discovery

The first step for protecting Exchange server is to identify the volumes Exchange server is using. This is accomplished through the Exchange Discovery FX job.

VX replication

The next step is a VX replication this is where all the discovered Exchange volumes are replicated to a remote DR server.

Exchange discovery again

The Exchange discovery job is run once again to capture all configuration related changes such are replication pairs set, retention path of each replication pair etc. The discovery job is run whenever there are Exchange configuration changes.

Exchange consistency

Finally a consistency job is run on a periodic basis to issue exchange specific consistency tags.

11.1 Discover

Log into the CX UI and click on "**File Protection"** to setup the FX job for Exchange Discovery to identify the Exchange volumes.

Step 149. Setup the FX job with "**Source"** as the active node and "**Destination"** as the DR server. Select the FX template as "**Exchange Discovery"**

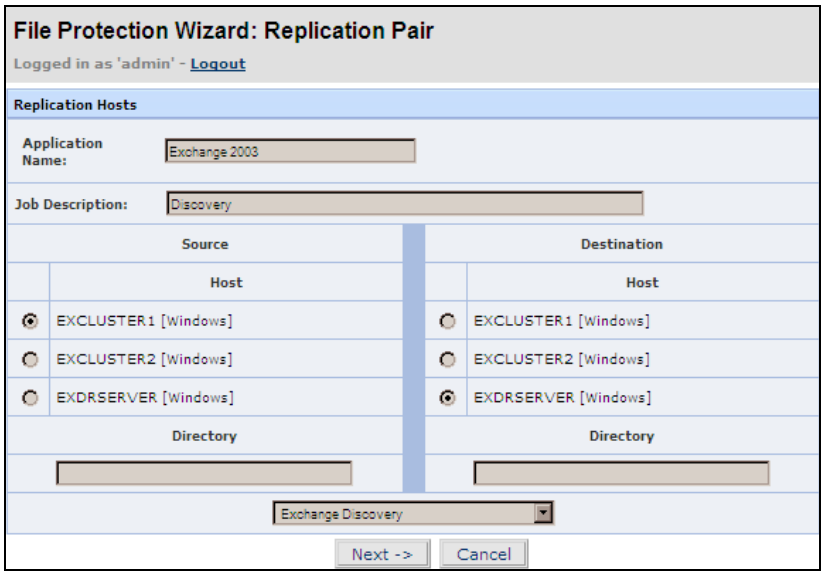


Figure 170

Step 150. The FX Job options screen opens up with all the required fields filled up automatically scroll down and click on "**Finish"**

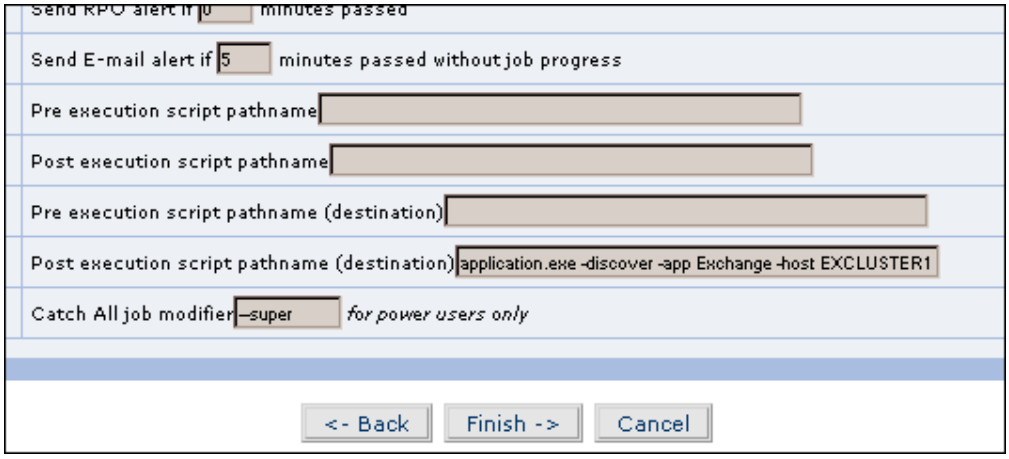


Figure 171

Then start the job.

Step 151. Before executing the discovery job the "**Application**" field is shown as unknown.

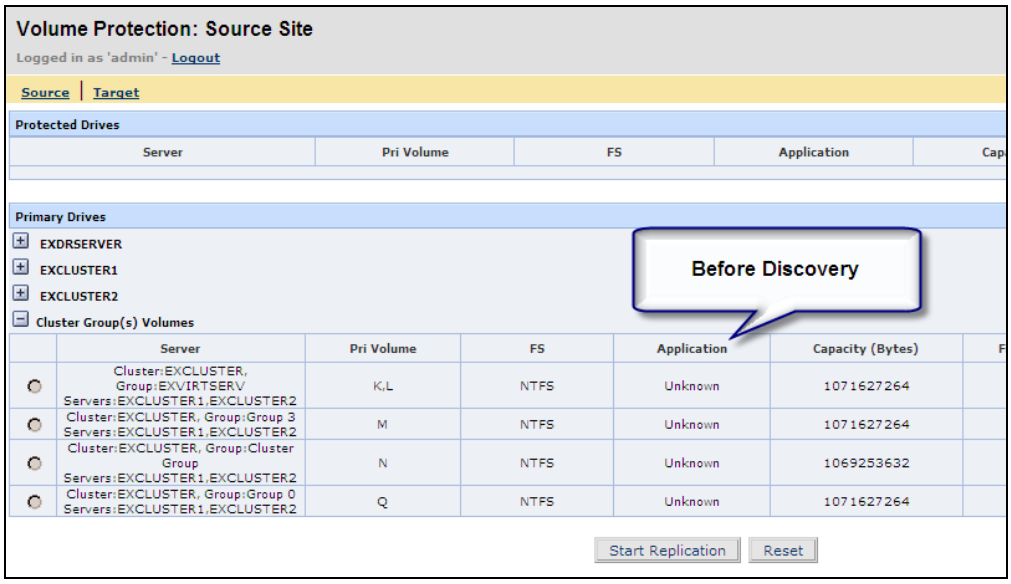


Figure 172:

Once the Exchange Discovery job is complete all the volumes used by exchange server show the application as Microsoft Exchange 2003 (or 2007).

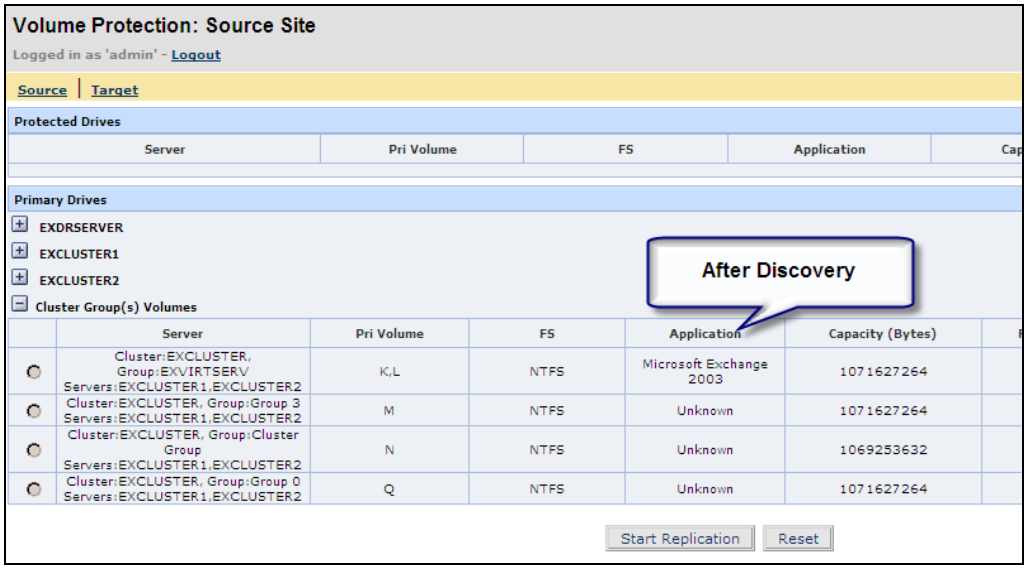


Figure 173:

Notes:

Discovery job is to be executed before and after setting up the VX replication pairs and additionally a discovery job is executed whenever there is an Exchange configuration change such as adding or removing exchange volumes, DB stores, or storage groups etc.

11.2 Volume Replication

Now that the exchange volumes are identified, proceed to setup a replication pair to backup exchange server on a cluster environment. The process however slightly varies with one additional screen.

Step 152. Click on "**Volume Protection**", select the Exchange volume and click on "**Start Replication**".

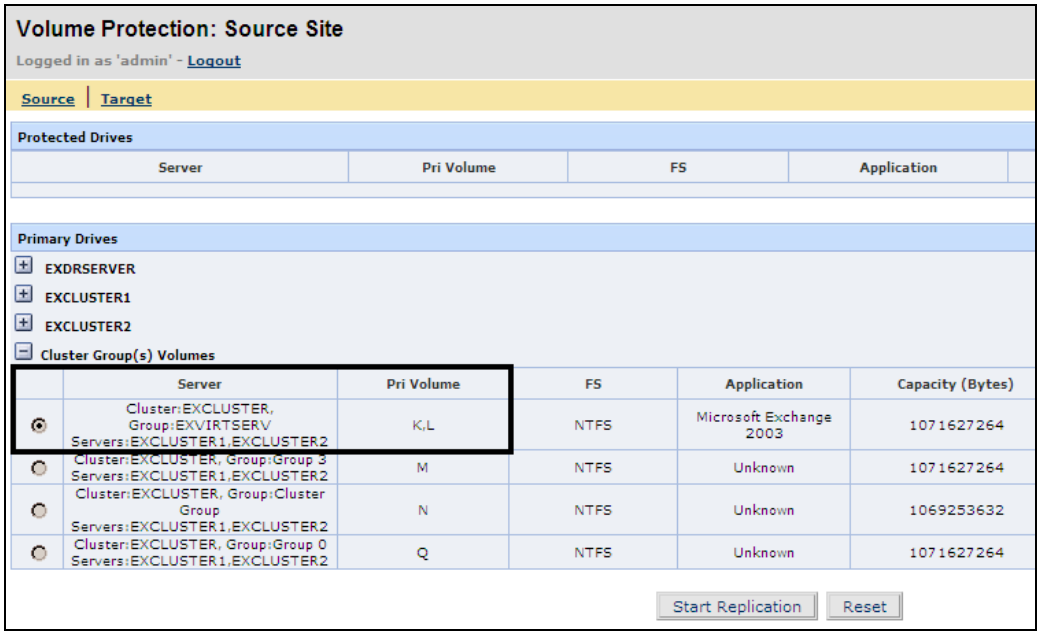


Figure 174:

Step 153. This is the screen that is shown only for clustered environment. Select the appropriate cluster drive and click on "**Next**".

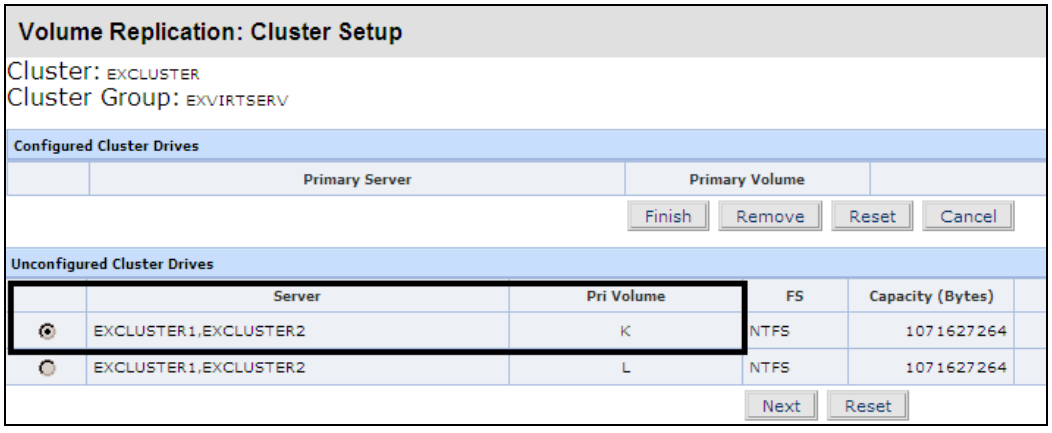


Figure 175:

Step 154. In the next screen, select the target volume and scroll down to set the "**Replication Options".**

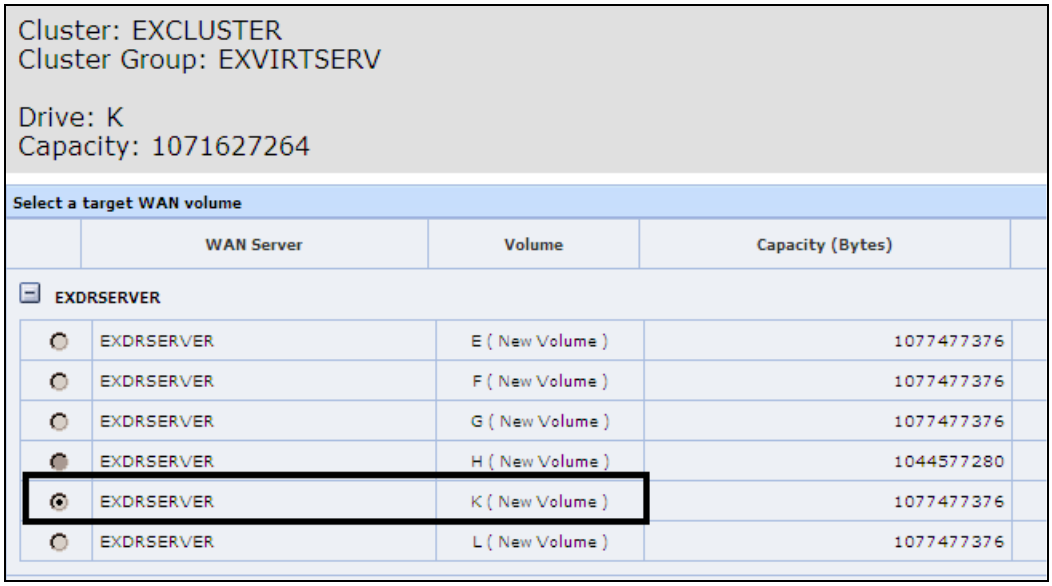


Figure 176:

Step 155. Ensure that "**Enable CDP Retention Option**" is enabled then click on "**submit**". Other replication options are optional.

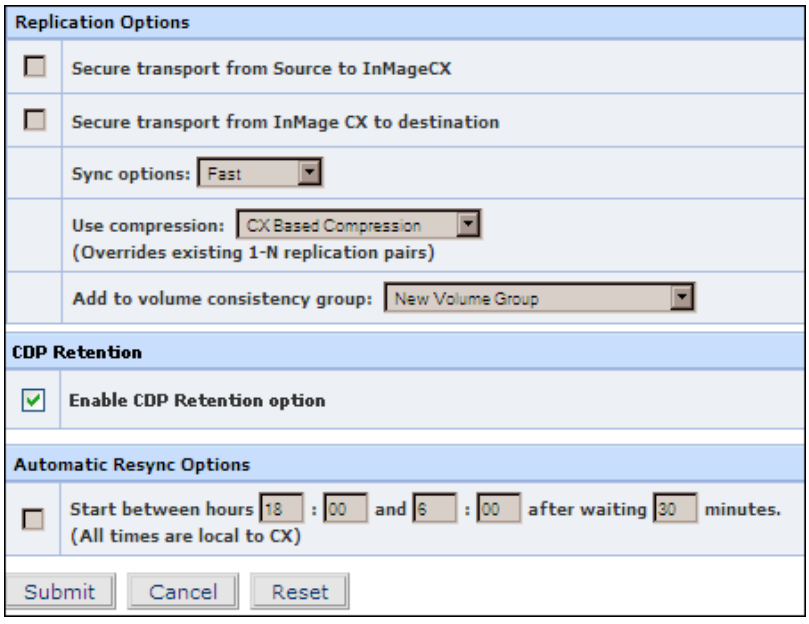


Figure 177:

Step 156. Since CDP retention is enabled, a retention policy needs to be selected. Select the type of retention policy desired and click on "**Submit**".

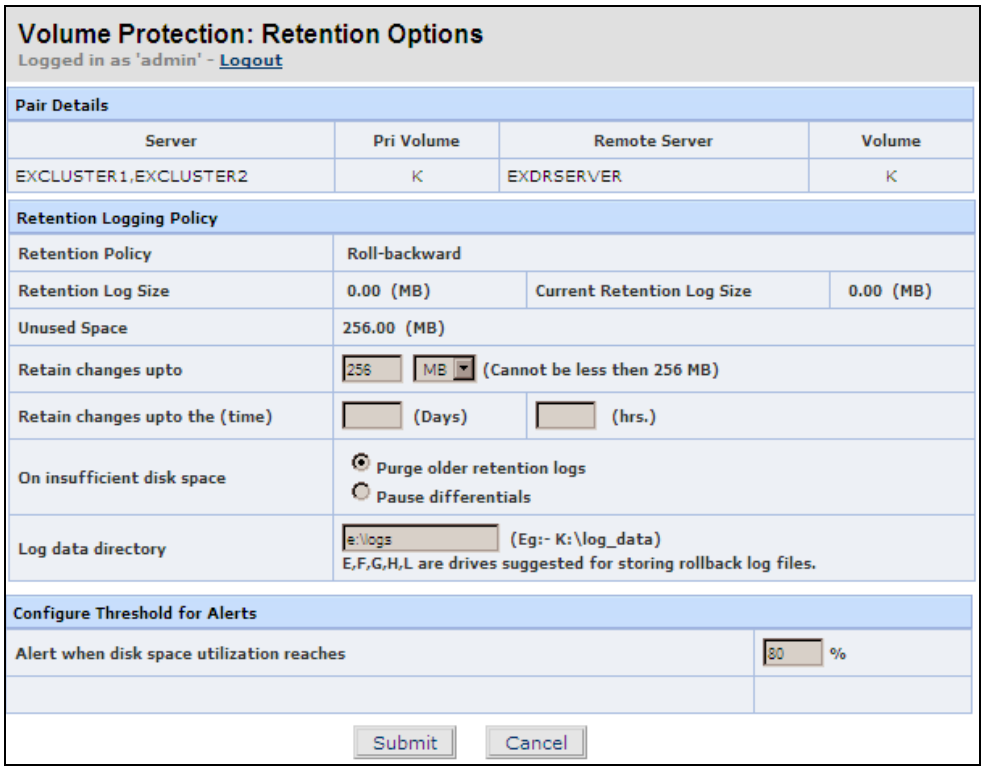


Figure 178:

Notes:

By default 256 MB is left free on the retention volume. You may choose to reduce this free space limit through "System -> Agent Settings -> Retention Reserve Space Settings" to reduce the "Unused space" on retention volume

Step 157. Select the configured cluster drive and then click on "**Finish**" to start the replication pair.

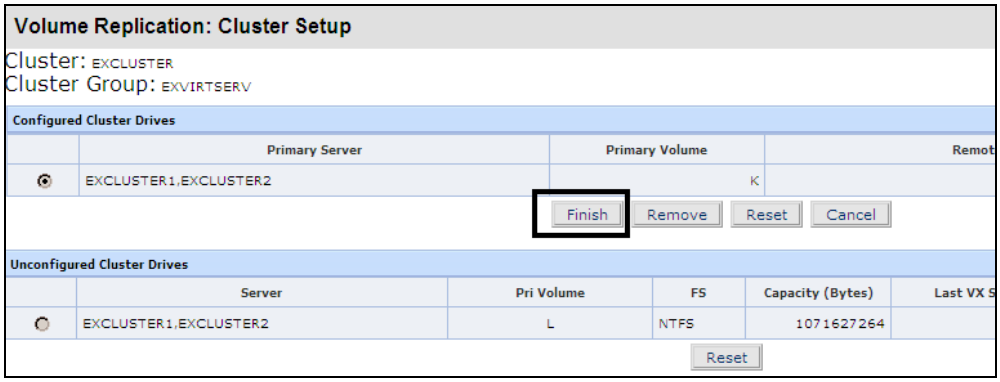


Figure 179:

Step 158. Similarly, replicate other volumes to their respective target volumes on the DR server (while maintaining similar drive mapping). The replication pair starts from "**Resyncing Step 1"** then moves to "**Resyncing Step 2"** and then finally reaches "**Differential Sync**".

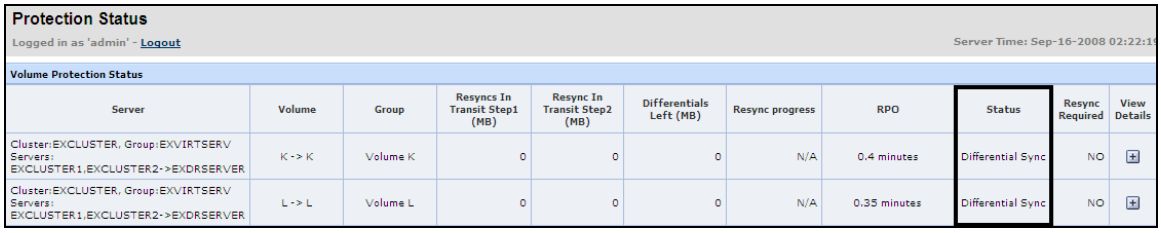


Figure 180:

Step 159. Once the replication pairs reach "**Differential Sync"** run the Discovery job. For each EVS or Exchange server, a total of three files are created on the corresponding DR server. These files contain :

- List of VX Replication pairs
- Retention logs of each replication pair
- Exchange database and log file location.

This information is later used while recovering from a production site outage.

Caution:

If the discovery job is not run after setting the replication pairs, Unplanned failover cannot be performed when the CX server is down.

11.3 Consistency

Step 160. Once the replication pair reaches "**Differential Sync**", configure FX job to issue consistency tags at regular intervals. It is important to select the source and destination as the active node. Then select the FX template as "**Exchange Consistency".**

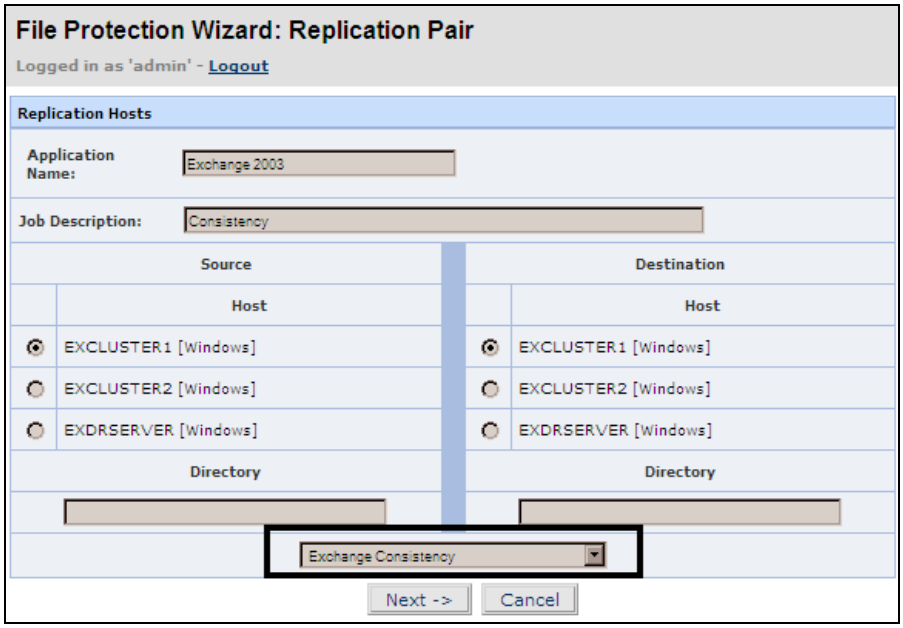


Figure 181

Step 161. The "**job options"** open up, with all the required fields filled up, scroll down to find that the source pre script is filled up automatically. Click on "**Finish"** and schedule the job to run at regular intervals.

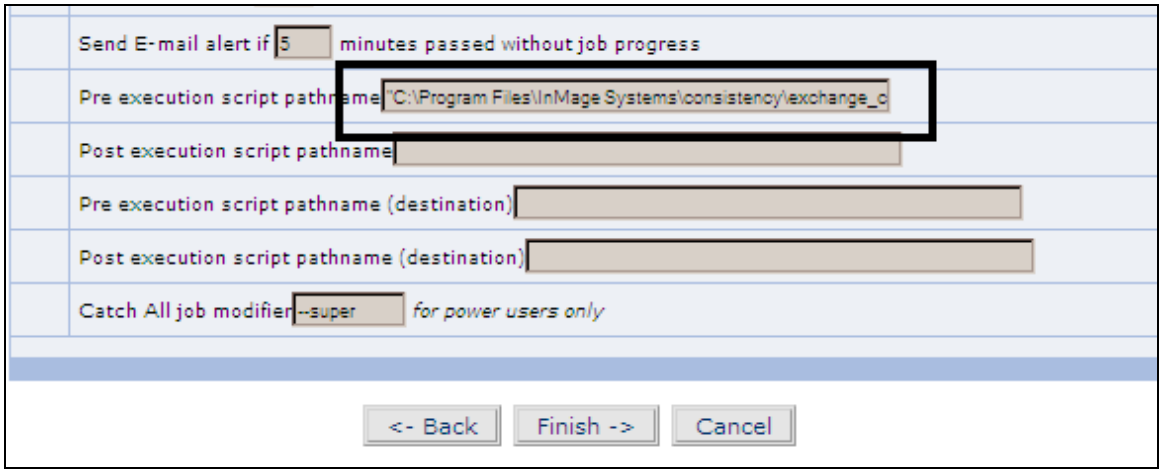


Figure 182

Step 162. Similarly set Exchange consistency job for all the nodes in the cluster. Consistency tags will be issued only on the active node. This ensures that consistency tags are issued even after cluster failover

Step 163. It is also important to run the Discovery job after setting up the replication pairs and it is recommended to schedule the discovery job to run once a day. This will catch any configuration changes that were made by the exchange administrators and replicate them to the target servers.

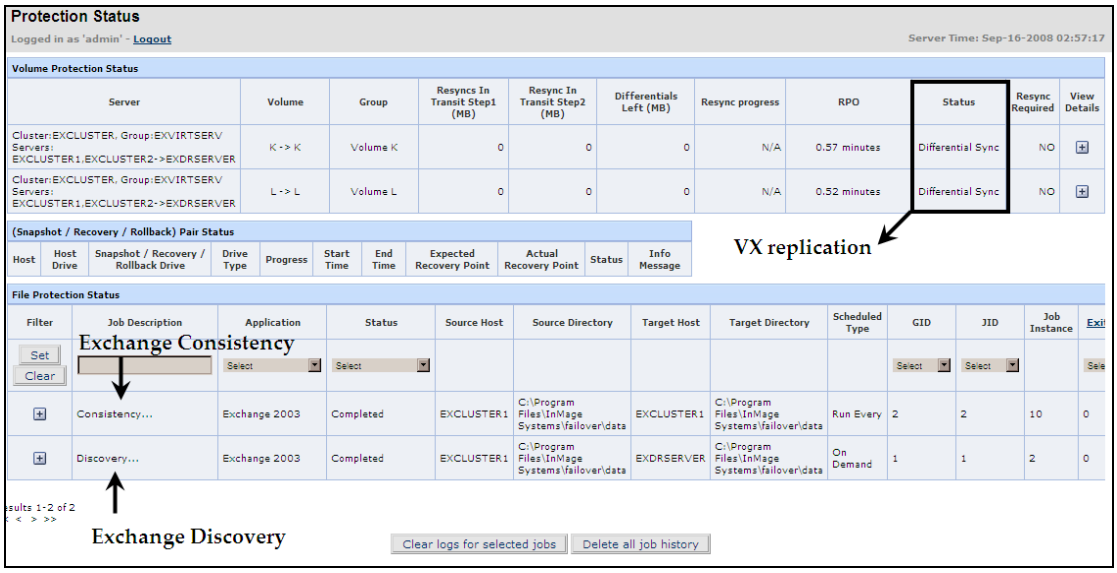


Figure 183: Active VX replication, successful discovery and consistency jobs

Caution:

It is important to select the source as the active node while setting up Exchange consistency job else the job will fail

If Exchange consistency job fails continuously then either the exchange services are not running on the active node or the active node is down.

12 Exchange Failover through CX UI (cluster environment)

12.1 Exchange planned failover

Step 164. Configure a new FX job to perform a planned failover. It is vital to select the active node as the source then select the DR exchange server for destination and finally select the FX template as "**Exchange Planned failover"** then click on "**Next".**

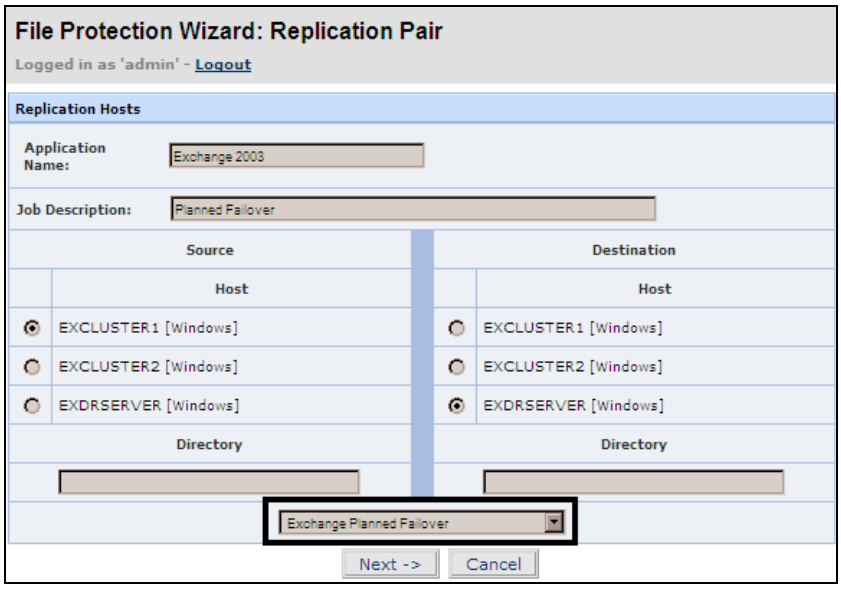


Figure 184:

Step 165. The "**Job Options"** page opens up with all the required fields filled up including source pre script and target post script. Click on "**Finish"** to continue and save the job in the following screen.

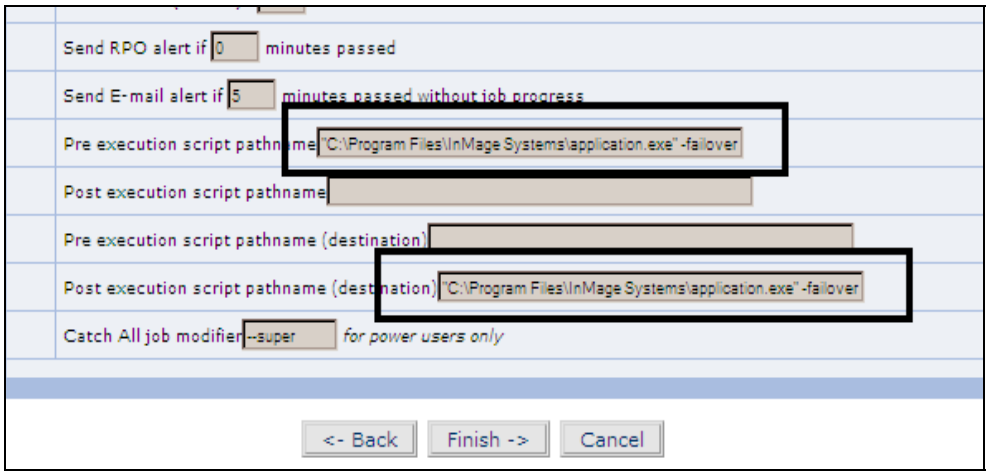


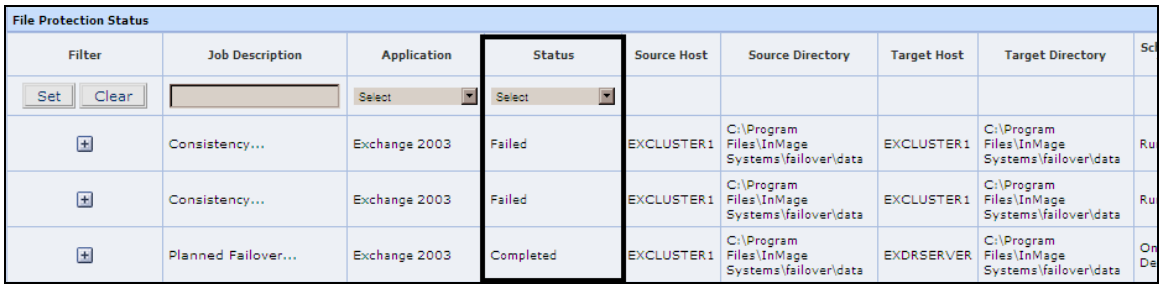
Figure 185:

At this point of time:

- The exchange volume(s) are being replicated to the backup exchange server.
- Consistency tags are being issued on the active node regularly
- The planned exchange failover job is configured.

To perform an Exchange planned failover, click on "**File Protection",** select the "**Exchange Planned Failover**" job and click on "**Start**".

Click on "**Protection Status"** to check the status of the "**Exchange planned failover**". The job's status turns "**Completed"** indicating that the failover completed successfully.



File Protection Status

Filter	Job Description	Application	Status	Source Host	Source Directory	Target Host	Target Directory	Sc
Set Clear		Select	Select					
⊞	Consistency...	Exchange 2003	Failed	EXCLUSTER1	C:\Program Files\InMage Systems\failover\data	EXCLUSTER1	C:\Program Files\InMage Systems\failover\data	Ru
⊞	Consistency...	Exchange 2003	Failed	EXCLUSTER1	C:\Program Files\InMage Systems\failover\data	EXCLUSTER1	C:\Program Files\InMage Systems\failover\data	Ru
⊞	Planned Failover...	Exchange 2003	Completed	EXCLUSTER1	C:\Program Files\InMage Systems\failover\data	EXDRSERVER	C:\Program Files\InMage Systems\failover\data	On De

Figure 186:

Notes:

After failover, exchange consistency job is set to "Run On Demand"

12.2 Exchange unplanned failover

Although the functionality differs between planned and unplanned failover, the process of setting FX jobs for both is similar with two small but significant changes.

Step 166. Assuming that the production exchange server is down, select the DR Exchange server for both the "**Source"** and "**Destination".** Select the FX template as "**Exchange Unplanned Failover**".

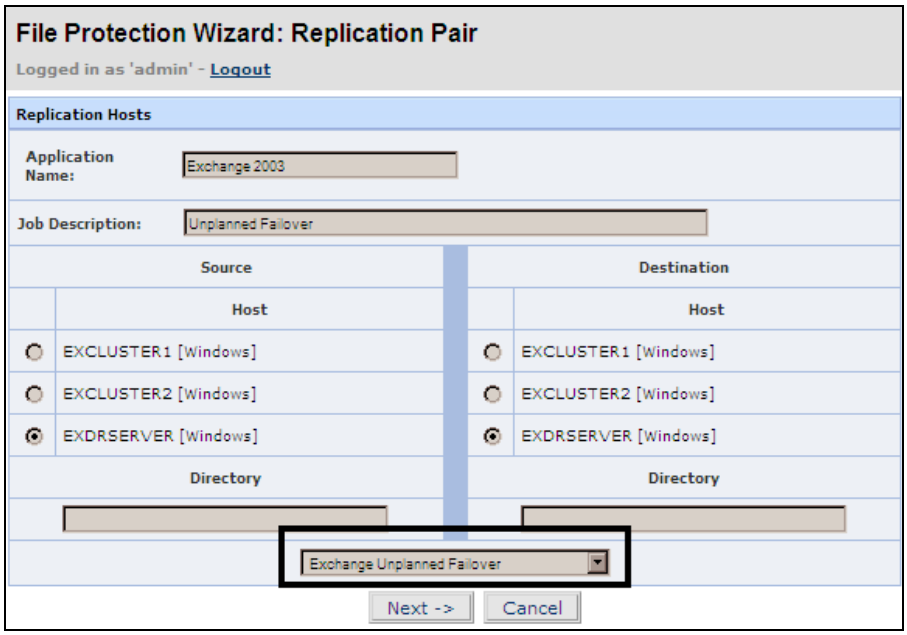


Figure 187:

Step 167. The "**Job Options**" page opens up. Scroll down to "**Miscellaneous options"** to edit the target post script. The **"–s switch"** contains the DR Exchange server's name, change this to **"–s <Production exchange server>"** then click on **"Save"**. Start the job to perform an unplanned failover.

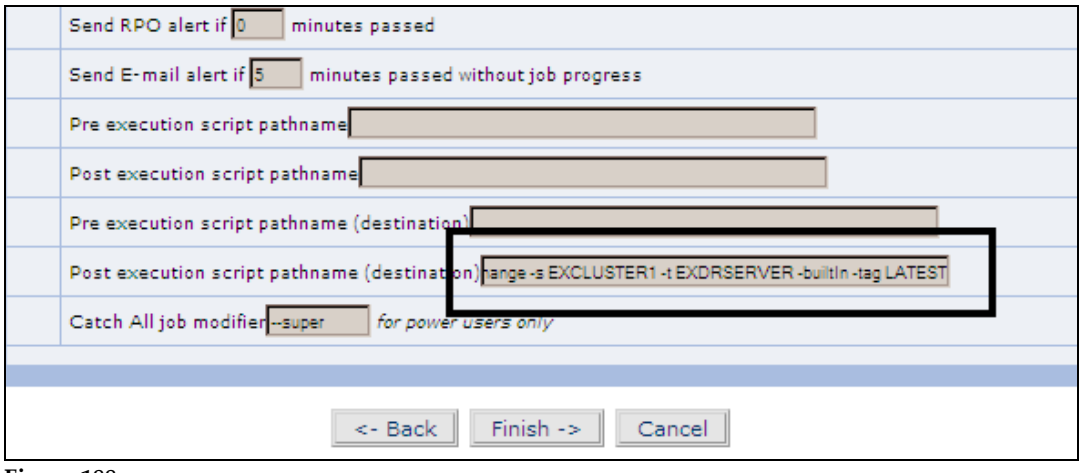


Figure 188:

12.3 Exchange failover (W/O CDP retention)

VX replication pairs without CDP retention do not have roll back capabilities. However, a failback may be performed through the FX job. Once the job completes, the target volume will be unlocked in read write mode and exchange services are started.

Set the FX job with "**source"** as the active node and the "**Destination"** as the DR server. Select the FX template as Exchange "**Failover Without Retention**".

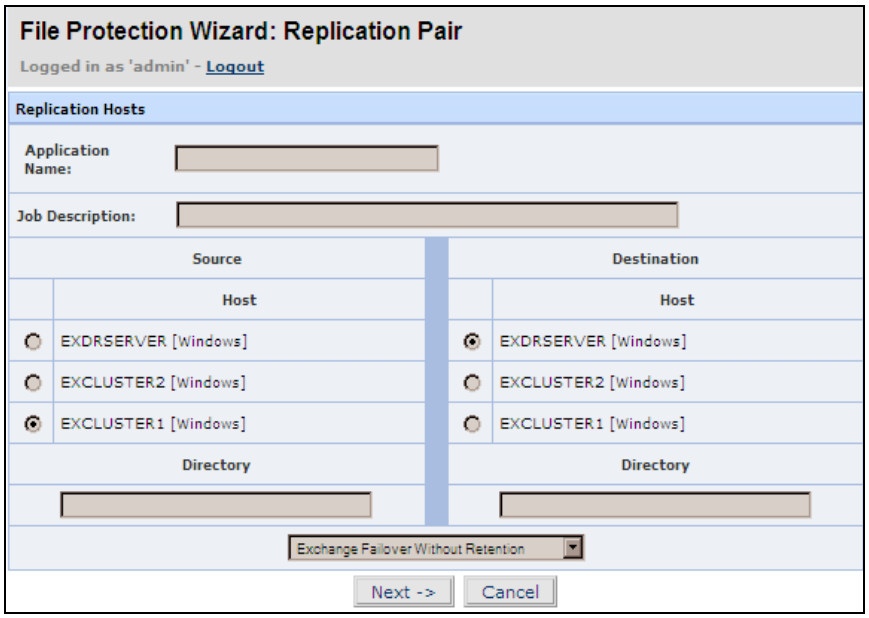


Figure 189

The job options page opens up. Click on "**Finish"** without changing any settings. Then start the job to complete a failover.

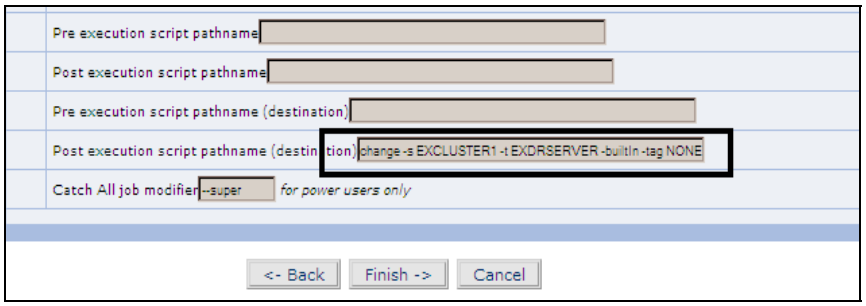


Figure 190

13 Exchange failover through CLI

13.1 Failover

13.1.1 Planned Exchange failover

Step 168. Planned and unplanned failovers on a cluster environment can also be achieved through command line interface. Access the active node's command prompt to issue the following command under the VX agent installation folder

`Application -failover –planned –app Exchange –s <`*name of the active node***`> -t<`***name of the DR server***`> -builtin –tag none`**

```
C:\Program Files\InMage Systems>application -failover -planned -app Exchange -s
EXCLUSTER1 -t EXDRSERVER -builtIn -tag NONE
Attempting to determine Exchange Virtual Server name for host : EXCLUSTER1 in ca
se it's a clustered configuration
Virtual Server Name for Host : EXCLUSTER1 is : EXVIRTSERV
EXVIRTSERV IP address = 10.0.133.203
EXDRSERVER IP address = 10.0.133.205
Checking for Active Directory update/modify privileges...

Command Line: application -failover -planned -app Exchange -s EXCLUSTER1 -t EXDR
SERVER -builtIn -tag NONE
Running under the user: BIT32.ORG\administrator
Process ID: 1872


Stopping the services dependent on Exchange services...
[INFO]: Empty list of dependent [on EXCHANGE] services found in C:\Program Files
\InMage Systems\Failover\Data\FailoverServices.conf
Found the virtual server: EXVIRTSERV
```

Figure 191

Step 169. The above command ends with a command enclosed within "**IMPORTANT INFORMATION".** This command is to be executed on the DR server to complete a planned failover.

```
***** The actual tag to failover to is : FileSystem48d8a783

**********IMPORTANT INFORMATION**********

Please run the following command on the Target Host to complete failover

Application.exe -failover -planned -app Exchange -s excluster1 -t exdrserver -bu
iltIn -tag FileSystem48d8a783

********************************************************************************

***** Successfully Completed Failover on Source Host

C:\Program Files\InMage Systems>
```

Figure 192

Step 170. Access the DR Exchange server's command prompt and navigate to the VX agent installation path and then issue the command enclosed within "**important information**" in the previous step. This concludes planned exchange failover through CLI for an active-passive clustered Exchange server.

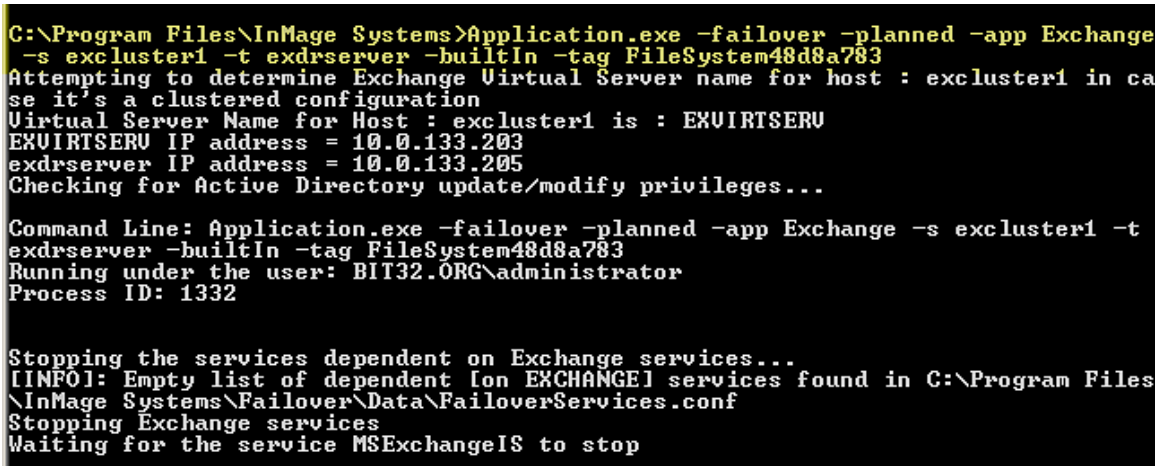


Figure 193

13.1.2 Unplanned Exchange failover

To perform an Exchange unplanned failover, access the DR server's command prompt to issue the following command under the VX agent installation folder.

`Application –failover –unplanned –app exchange –s <`*name of the active node***`> -t <`***name of the DR server***`> -builtin –tag latest`**

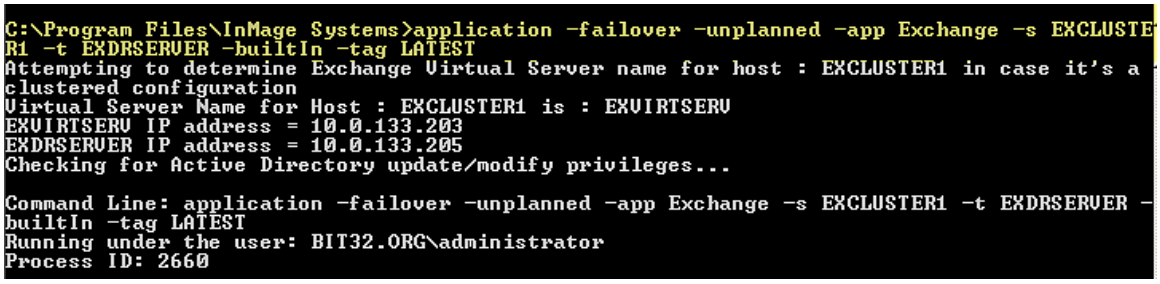


Figure 194

Notes:

Ensure that Exchange discovery is performed after setting the VX replication pair before going ahead with Exchange unplanned failover
For exchange 2007 the –app switch will be exchange2007

14 Exchange Failback through CX UI.

A failback is performed once the production server is ready to resume operations. Failback is performed in seven sequential steps as shown below.

Step 1: Cluster to Standalone: As part of a failback a reverse replication is set from the DR server to the production server. While the replication is in progress the VX agent locks the target volume. Since the target volume is clustered, the VX agent's drive lock results in a cluster failover. To avoid this, the cluster machine is converted into a standalone machine in this step. This is achieved through a command line tool bundled with the VX agent.

Step 2: Reverse replication: After the production machine is converted from a cluster machine to a standalone machine, a reverse replication is set from the DR server to the production server with the same drive mapping.

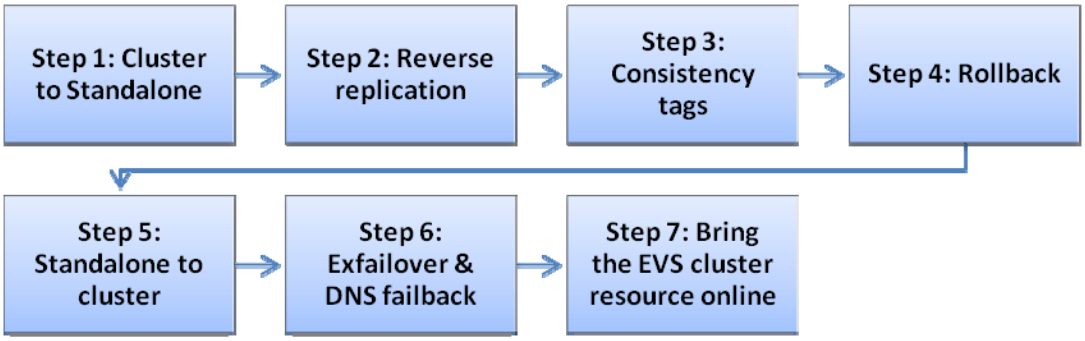


Figure 195

Step 3: Consistency tags: VACP consistency tags are issued on the DR server. A rollback is later performed to the same consistency tag for all the Exchange volumes. Before issuing a tag ensure that you stop Exchange services. The list of services to be stopped is given in the Consistency tags section on page 125.

Step 4: Rollback: All the Exchange volumes are rolled back to the same consistency tag as issued in the previous step.

Step 5: Standalone to cluster: Once the target volume is rolled back, the production machine is restored back to its former cluster state. This is achieved through the same CLI tool.

Step 6: Exfailover and DNS failback: Exfailover is performed to restore Exchange server while DNS failback is performed to restore original IP address back to the production server.

Step 7: Bring the EVS cluster resource online: Access the production Exchange server and bring the EVS cluster resource online. This will also bring the exchange services online.

14.1 Step 1: Cluster to standalone

Step 171. To convert the clustered production server to a standalone server, access the active node of the production server then navigate to the VX agent installation path through the command prompt to issue the following command

```
Clusutil –prepare ClusterToStandalone:<name of the active node> -
shutdown <names of the passive nodes separated by commas>
```

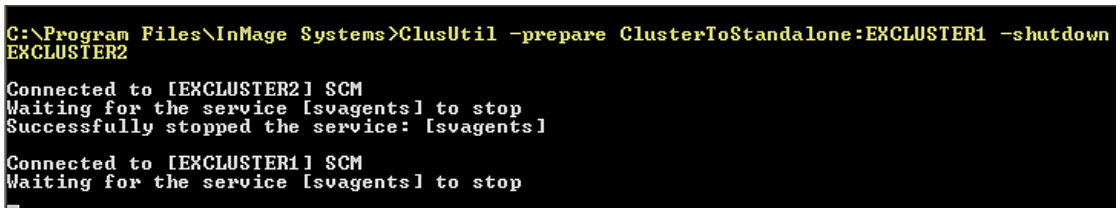


Figure 196

This shuts down the passive nodes and restarts active node, temporarily converting the active node into a standalone server.

Notes:

For 2008 cluster, once the active node restarts, the volumes would go offline. To bring the volumes online use the following command

Clusutil –prepare onlinedisk

Caution:

- You will need to login with domain administrator privileges to execute the "**clusutil**"command.
- Ensure that the CX server is up and running before running the **`clusutil`** command.
- Clusutils.exe is to be executed on the node which is supposed to be turned into a standalone server.
- Ensure that all passive nodes are unlocked, you may use an additional switch "**–force"** at the end of the above command to force the execution.

Switch to the CX UI to observe that the Cluster Group Volumes disappears and all the volumes will be shown belonging to the active node.

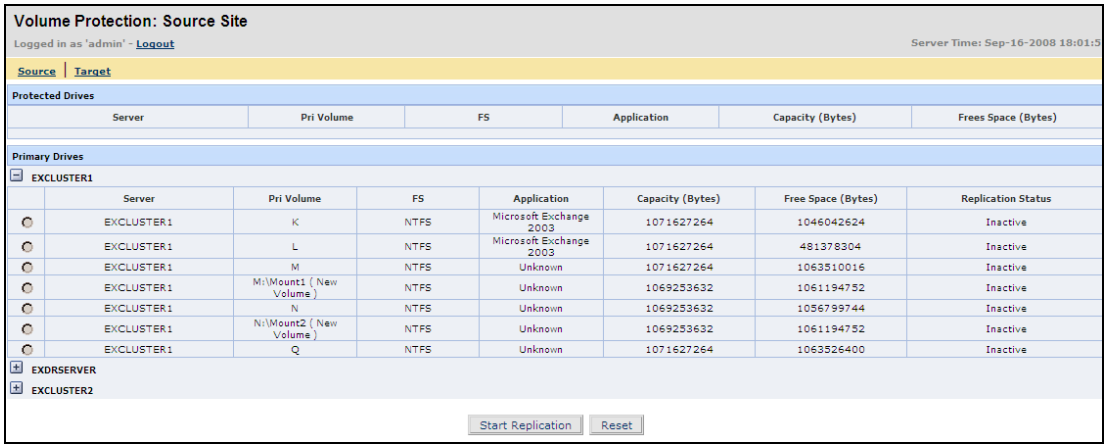


Figure 197

14.2 Step 2: Reverse replication

Step 172. Access the CX UI, and then expand the DR server to select the Exchange volume as source. Note that this was once a target volume. Click on "**Start Replication".**

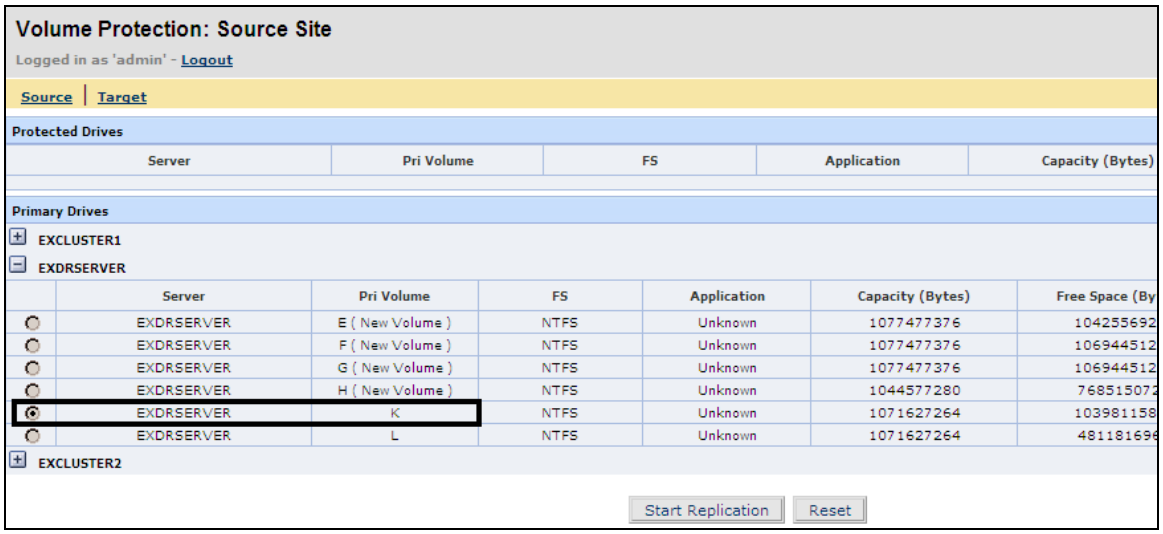


Figure 198

Step 173. In the next screen; expand the production server to select the target volume, which was once the source volume. Then scroll down to set the "**Replication Options".**

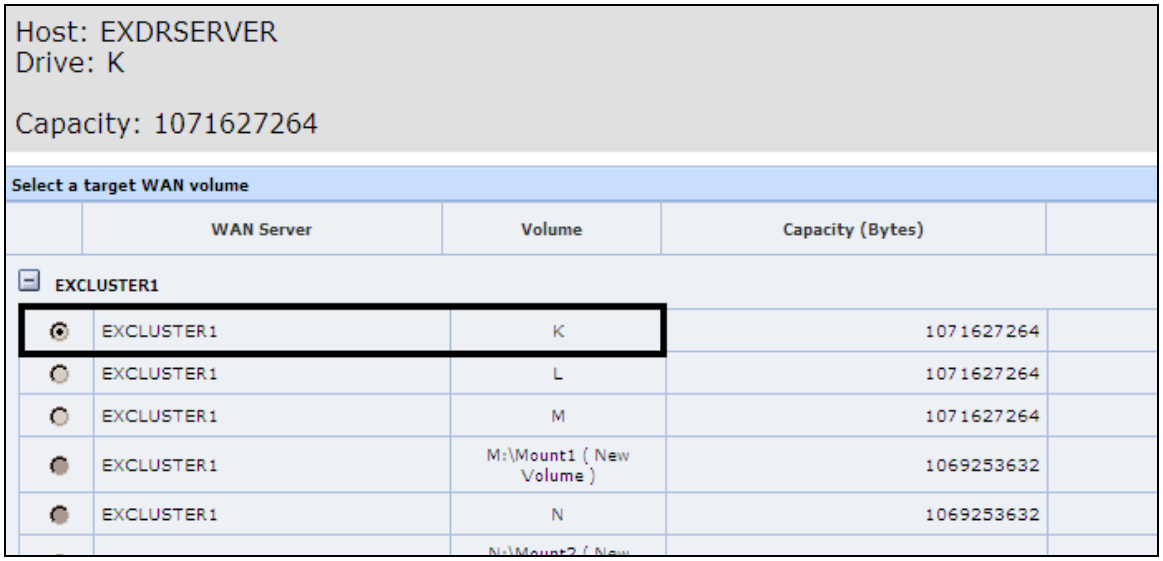


Figure 199

Step 174. Ensure that the "**Enable CDP Retention option"** is enabled then click on "**Submit"** to continue.

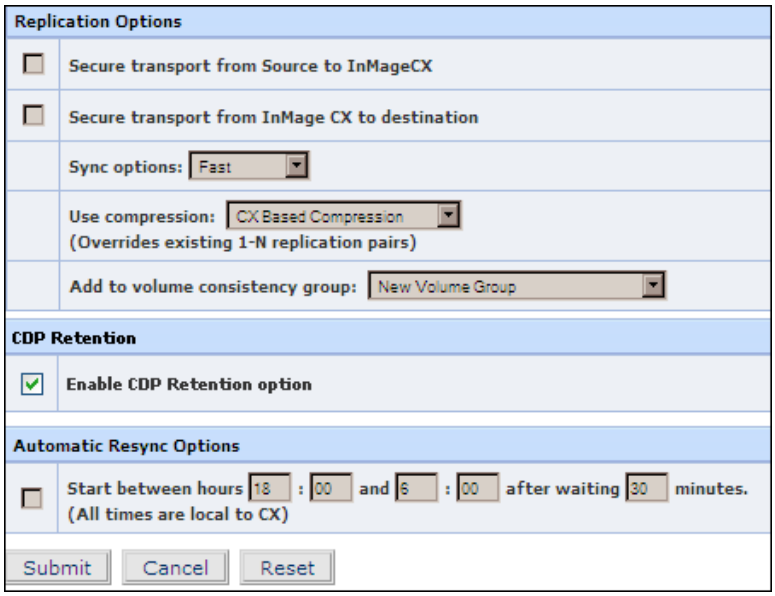


Figure 200

Step 175. Enter the type of retention policy applicable for the replication pair and click on "**Submit"** to start the replication pair.

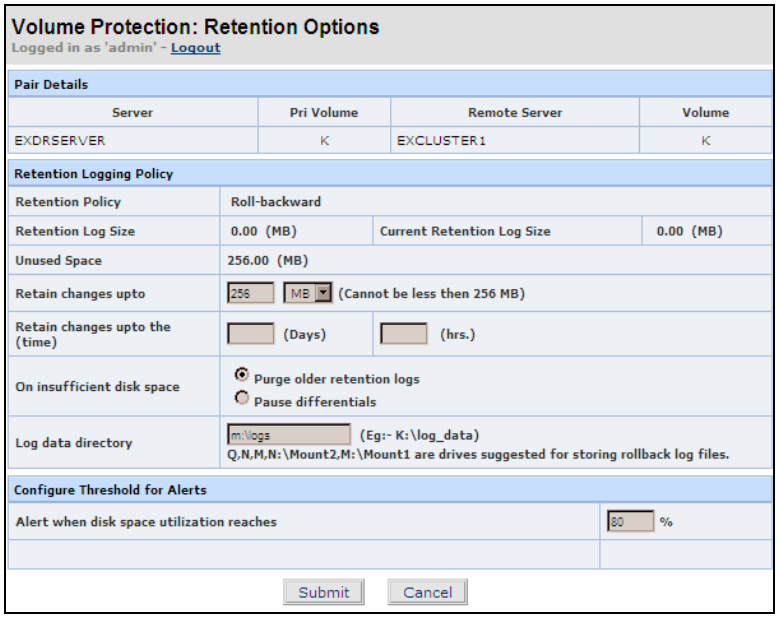


Figure 201

Step 176. Similarly replicate the other volumes. Once the replication pair(s) reach "**Differential Sync",** proceed to the next step

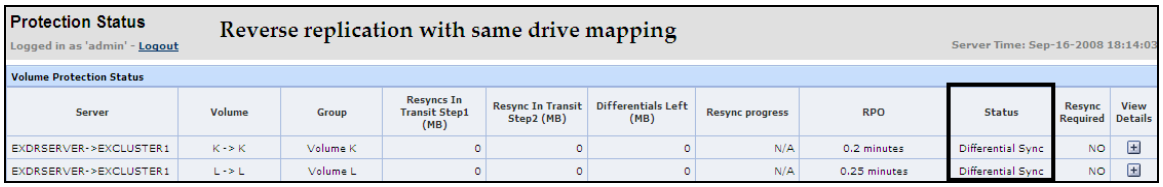


Figure 202

14.3 Step 3: Consistency tags

Step 177. Stop the following exchange services on the source machines (DR servers). Some of these services do not exist in Exchange 2007 and will fail to stop, this may be ignored.

	Exchange 2003	Exchange 2007
Service names	MSExchangeMGMT	MSExchangeIS
	RESvc	
	MSExchangeIS	
	MSExchangeMTA	MSExchangeSA
	MSExchangeSA	

Notes:

If there are any dependency services, stop the dependencies and then stop the Exchange services.

Step 178. Then access the command prompt of the DR server to issue a consistency tag. Navigate to the VX agent install path to issue the following command

```
Vacp –v <exchange volumes separated by semi colon> -t “<failback consistency tag>”
```

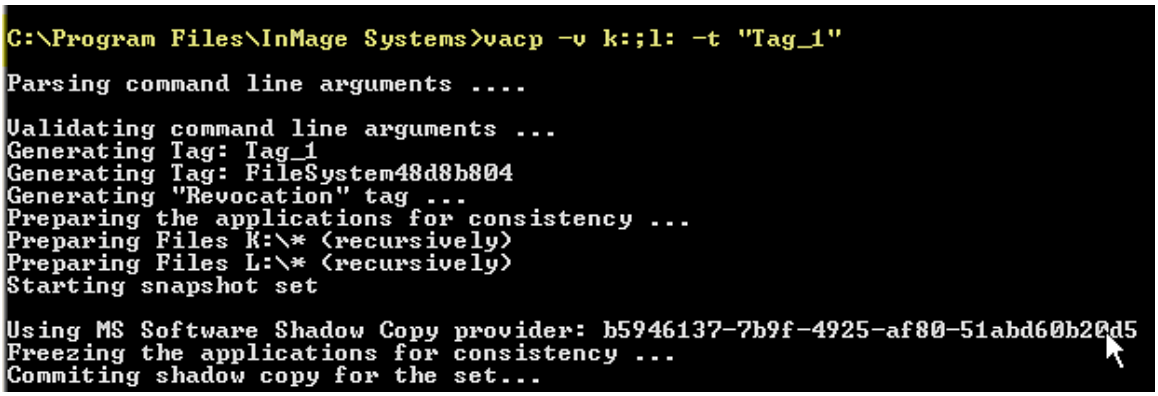


Figure 203

Notes:

This consistency tag will be used perform rollback in the next step

To issue consistency tags to multiple volumes, separate the volumes with a semi colon

14.4 Step 4: Rollback

Step 179. After issuing consistency tags on the DR server. Switch to the CX UI to perform a target volume rollback for all Exchange replication pairs.

Step 180. Click on "**Recovery"** then select the replication pair you want to rollback and click on "**Rollback".** A message box appears for confirmation, click on "**Ok"** to proceed. It might take a few minutes for the tags to reach the CX server.

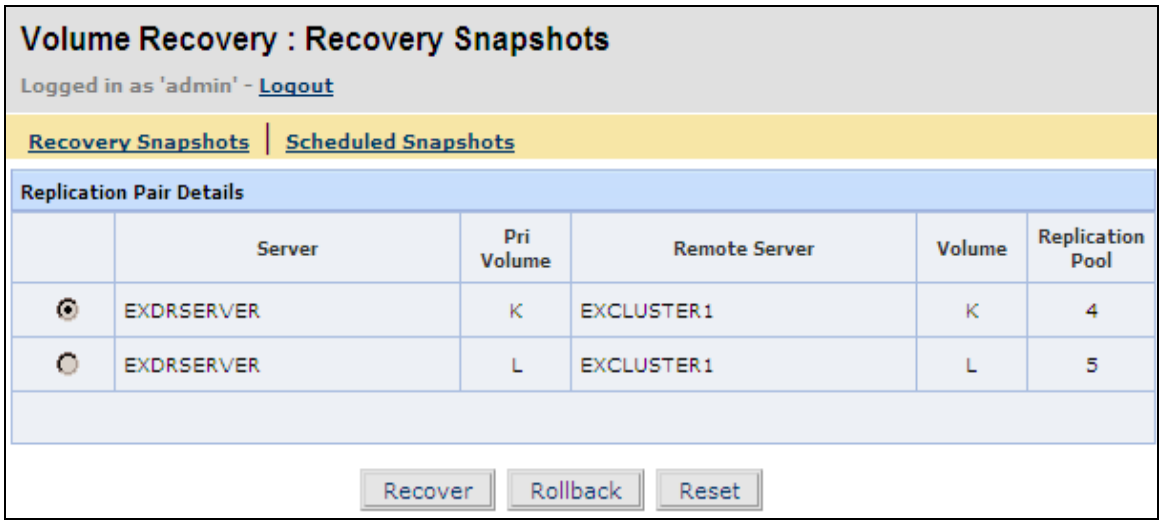


Figure 204

Step 181. The next screen opens up as shown in the picture below. Select the "**Using Application consistency & Event based**" option.

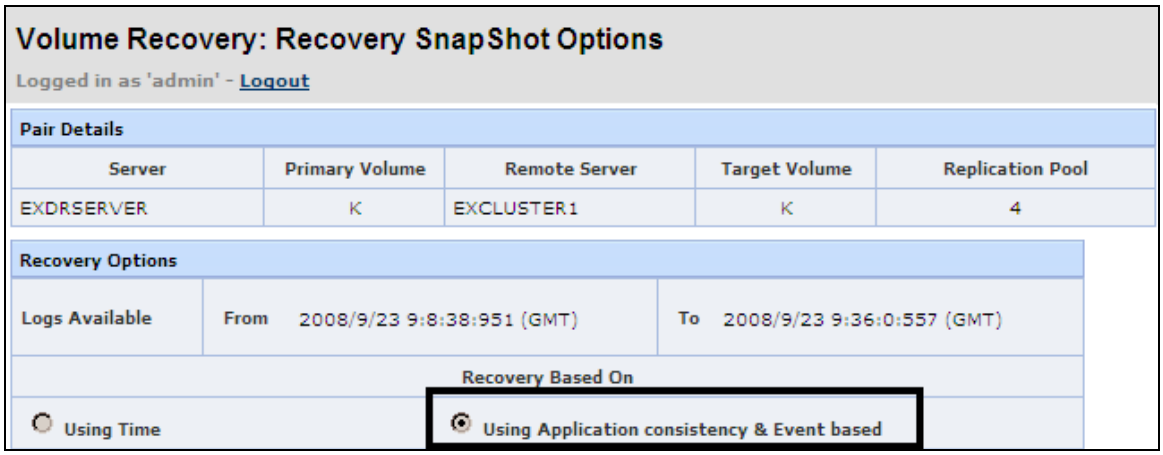


Figure 205

Step 182. The interface changes to the "**Search Result**" as shown below, select the consistency tag as issued in the step Consistency tags on page 125. Then click on "**Save**".

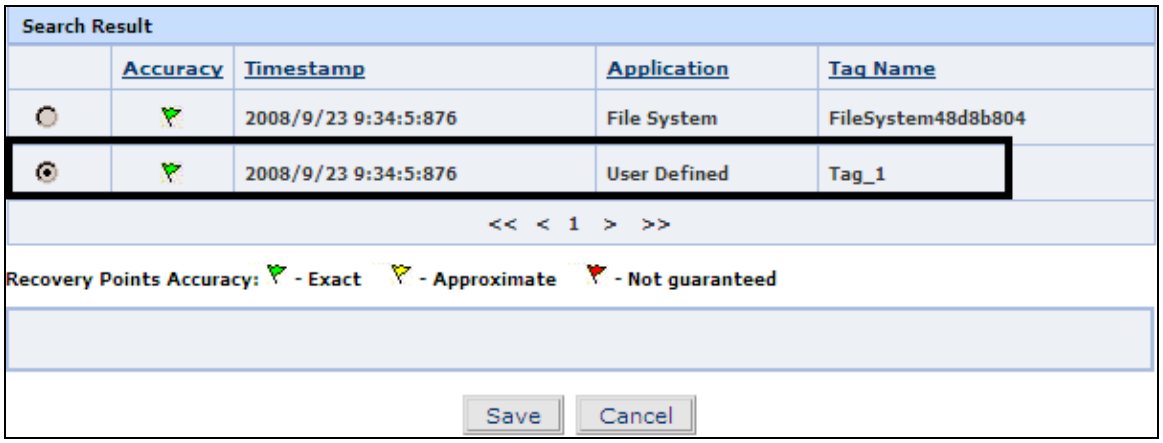


Figure 206

Step 183. This will break the replication pair and roll back the target volume to a consistent point. Similarly rollback all other replication pairs to the same consistency tag.

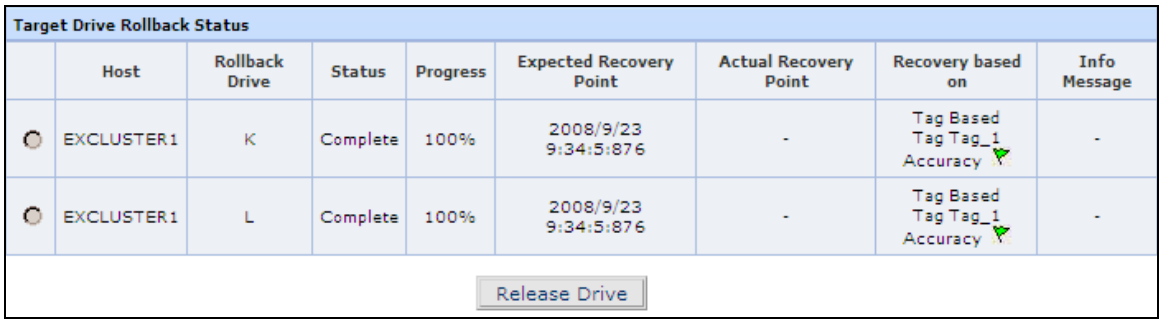


Figure 207

14.5 Step 5: Standalone to cluster

Now that the production server is updated, restore the production server back to its clustered state. On the standalone target (original source) node, Navigate to the VX agent installation path to issue the following command

`Clusutil.exe –prepare StandaloneToCluster:<name of the active node>`

The command reboots the machine. Once the node has rebooted, log back in. You will need to then start all the passive nodes that were shutdown earlier.

14.6 Step 6: Migration & DNS Failback

Once the production machine comes up, access the command prompt and navigate to the VX agent installation path to issue the following command

`Exfailover –failback –s <`*name of the DR server*`> -t <`*Exchange Virtual Server Name*`> –autorefine [-cs]`

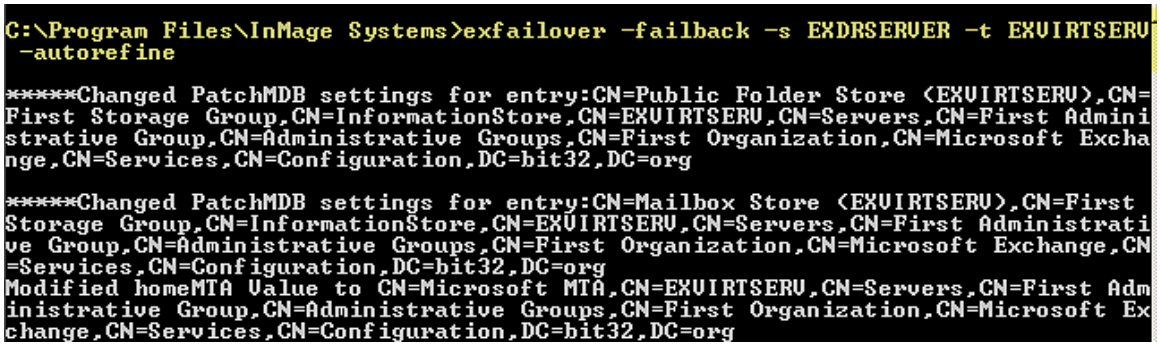


Figure 208

This should migrate all user and configuration data back to the production cluster server. However, all the clients will still be pointed to the DR server, until a DNS failback is performed.

You can add the "**-dryrun**" switch to see if the command will be successful before going ahead with the Exfailover

Notes:

Specify the option "-cs" only if any configuration change was at the DR Exchange server after failover & before failback. For example, a new storage group is created at DR Exchange server after failover & before failback.

To restore the DNS entries, a DNS failback is performed. Access the command prompt of the production server and navigate to the VX agent installation folder to issue the following command.

`Dns -failback -host <`*name of the EVS*`> -IP <`*original EVS IP address*`>`

```
C:\Program Files\InMage Systems>dns -failback -host EXVIRTSERV -ip 10.0.133.203

Connecting to CX to determine if host : EXVIRTSERV is part of a cluster...
Using DNS name : EXVIRTSERV For DNS failback
EXVIRTSERV FQDN = EXVIRTSERV.bit32.org

****** DNS record for EXVIRTSERV now modified to point to 10.0.133.203 successful
ly
DNS cache flushed successfully.


C:\Program Files\InMage Systems>_
```

Figure 209

14.7 Step 7: Bring all EVS Services Online

Step 184. Open cluster administrator on the production server and "**Bring online"** the group owning MTA resource through cluster administrator. This concludes failback.

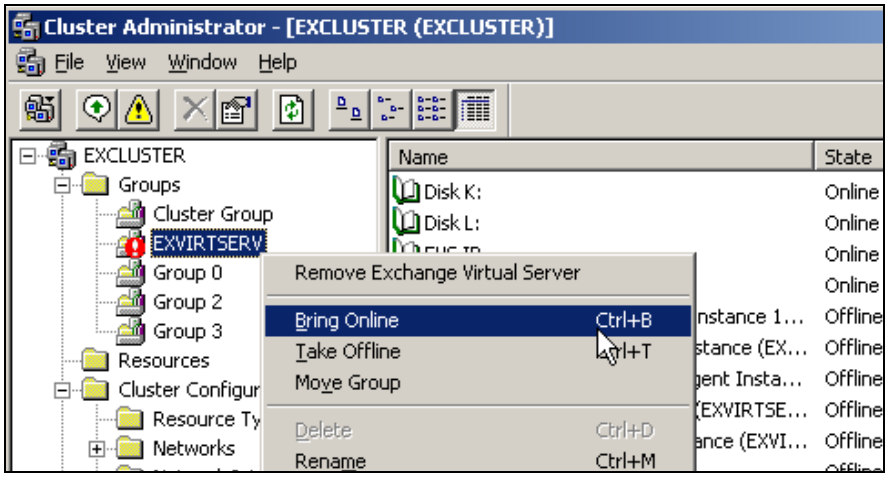


Figure 210

Part 3: Active/ Active Clustered Production Server and Standalone DR Server

This part explains protecting and recovering an Exchange sever with more than one EVS. Two active node Exchange servers with each node running a separate Exchange Virtual Server (EVS) will be considered as a production server while the DR server will be a standalone server.

15 Introduction to active/ active exchange failover

A clustered Exchange server may contain multiple Exchange virtual servers, each operating from a different node. Discovery, VX replication, issuing consistency tags etc are unique for each EVS. Each EVS is replicated to a different DR server. Post failover each of the DR server will run its corresponding EVS.

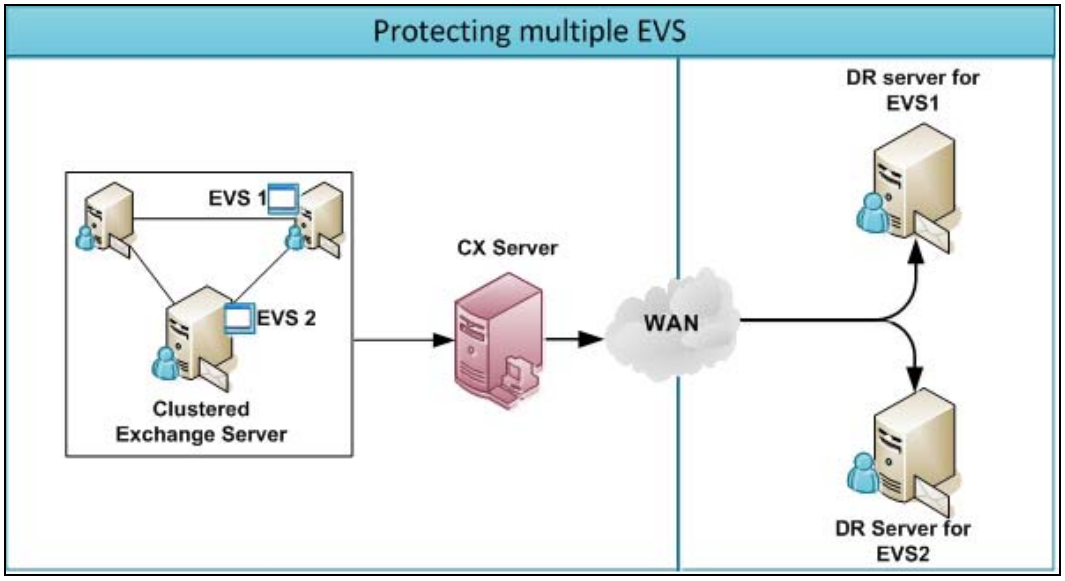


Figure 211

While performing recovery operations such as failover or a failback, the process is different. For failover the EVS owning the MTA resource is failed over last. While performing a failback the production Exchange server is converted into a standalone Exchange server through the cluster utility tool provided by Hitachi Data Systems to enable the production machine to act as a target host. Later the production server is restored to its Clustered state through the same tool. This is achieved in eight steps as explained in the section Failback section on page 150.

16 Protect

16.1 Discovery

16.1.1 First EVS

Step 185. Open the CX UI and click on "**File Protection**". Then, click on "**New Job Group Wizard**".

Figure 114:

Step 186. Click on "**Add Job"** to continue.

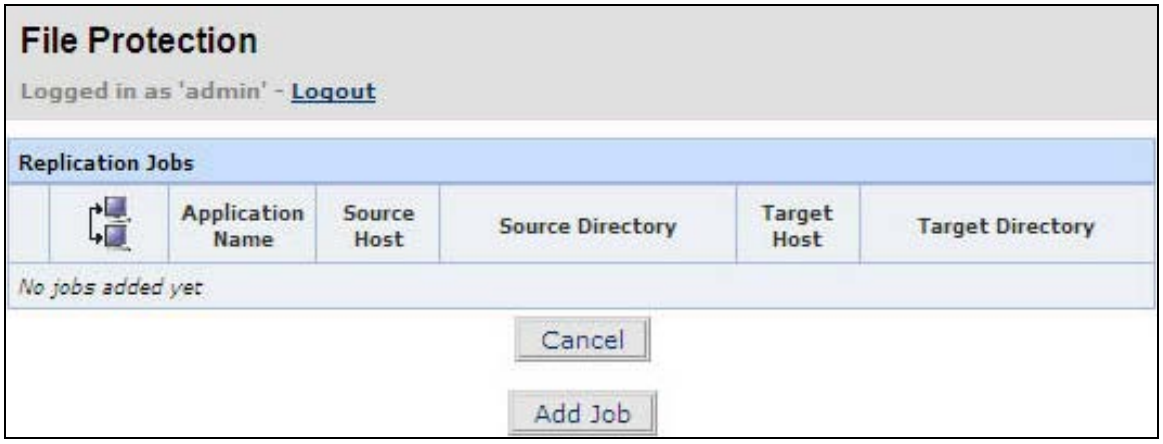


Figure 115:

Step 187. Select the "**Source**" as the active node on which the EVS is running and the "**destination**" as its corresponding target host. Select the FX template as "**Exchange Discovery**" and click "**Next**" to continue.

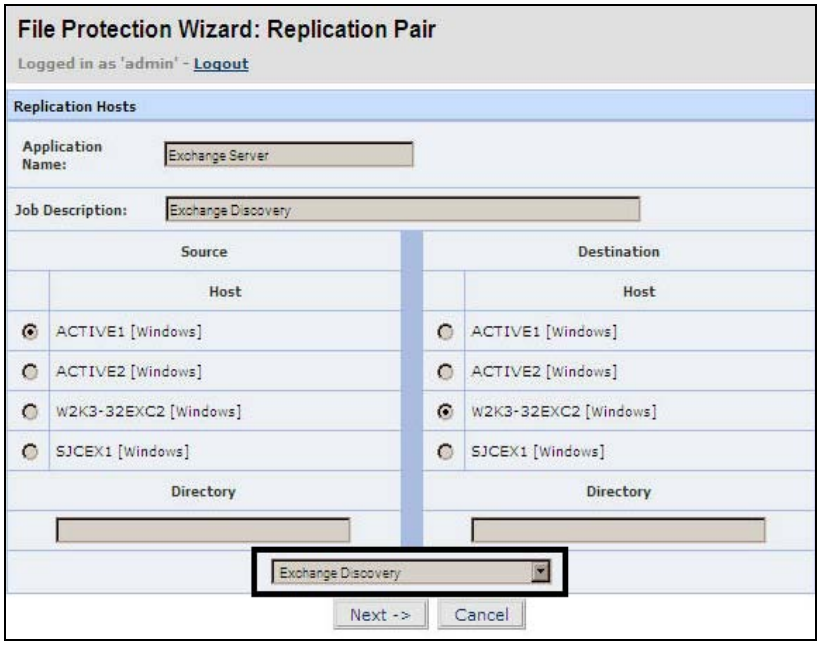


Figure 116:

Step 188. The FX "**Job Options"** opens up with all the required fields filled up, scroll down to "**Miscellaneous Options"** to edit the target post script with the switch "**`-host <`***name of the EVS*`>`*" and then click the "**Finish**" button to continue.

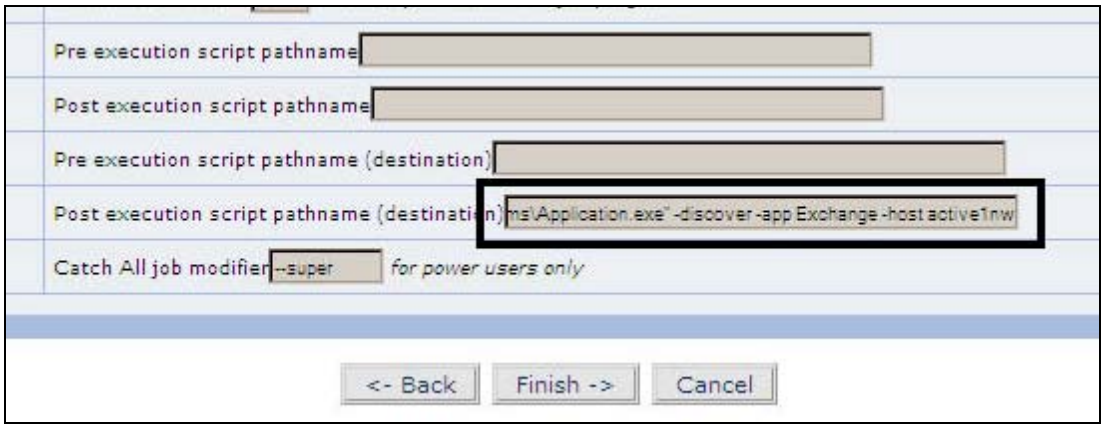


Figure 117:

Step 189. The job is scheduled to "**Run On Demand**". Click on "**Finish**" to save the job.

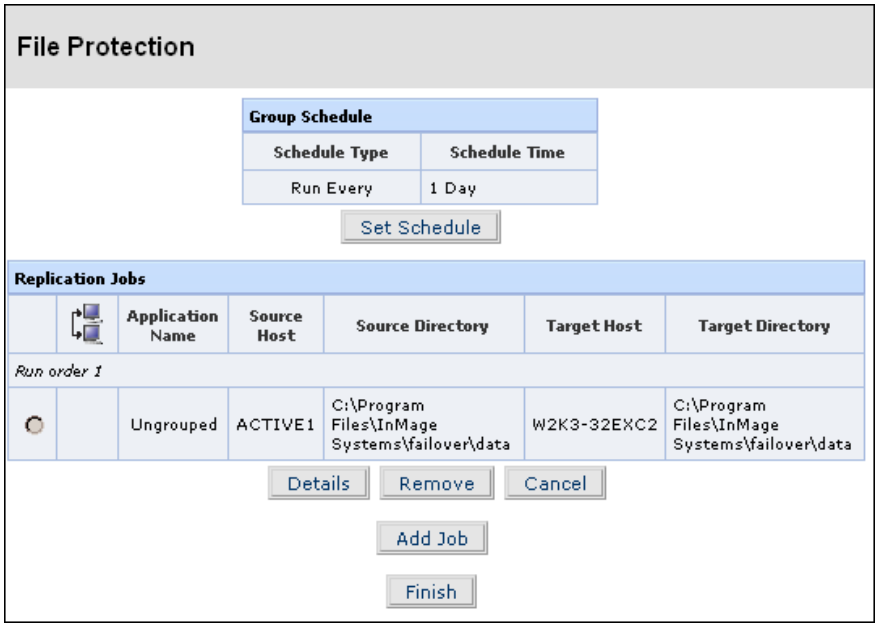


Figure 118:

Step 190. Click on "**File Protection"** then select the job and click on "**Start**" to discover all volumes specific to this EVS.

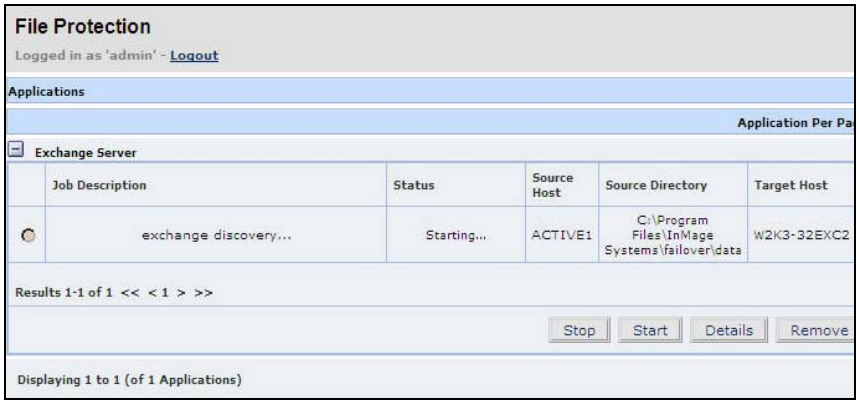


Figure 119:

Step 191. You may observe the progress of the job by clicking on "**Protection Status**"

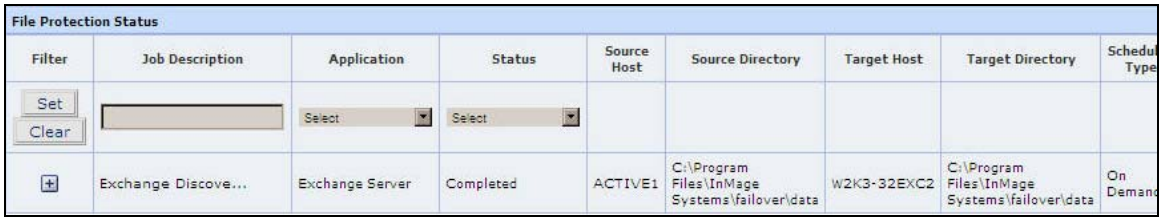


Figure 120:

16.1.2 Second EVS

Similarly you may discover all other EVS

Step 192. The only difference is with the target post script, Ensure that you specify the EVS name by adding the switch **`-host <`***name of the EVS***`>`**

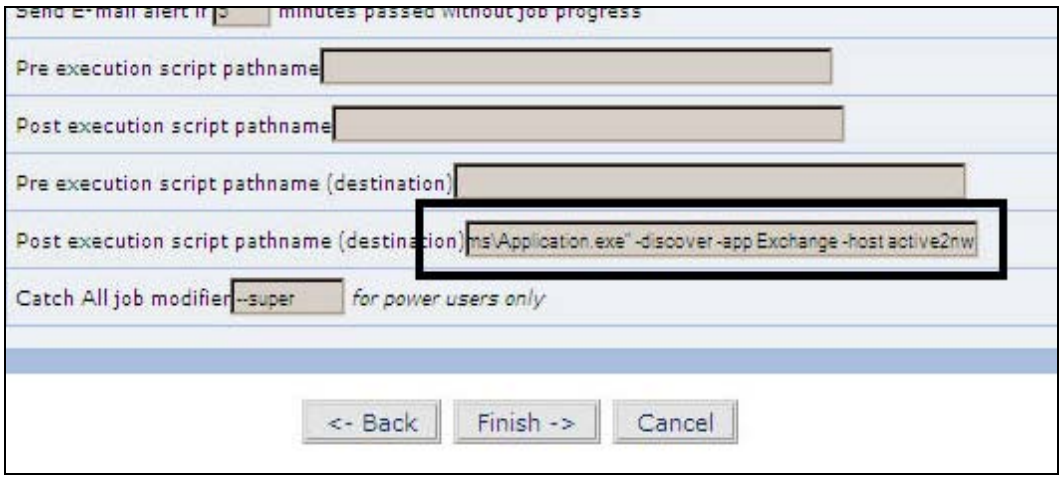


Figure 121:

Step 193. Click on Protection Status to observe the status of all FX jobs.

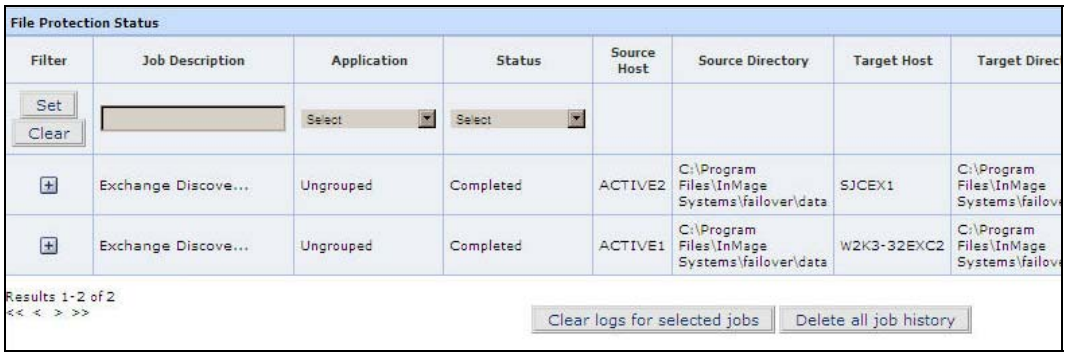


Figure 122:

Notes:

The CX UI will show the latest EVS that is discovered.

16.2 Volume Replication

16.2.1 First EVS

Once all the EVSs are discovered, proceed to replicate their corresponding volumes.

Step 194. Click on "**Volume Protection**" and expand the "**Cluster Group (s) Volumes**" to select the source cluster group and click on "**Start Replication**"

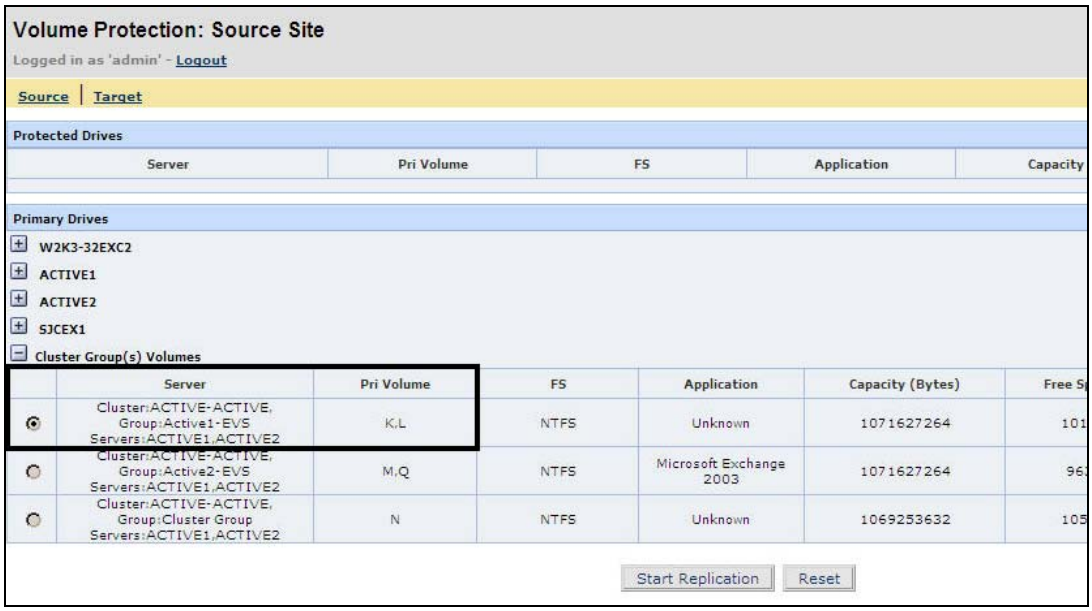


Figure 123:

Step 195. Select the desired clustered volume to be replicated and click "**Next**".

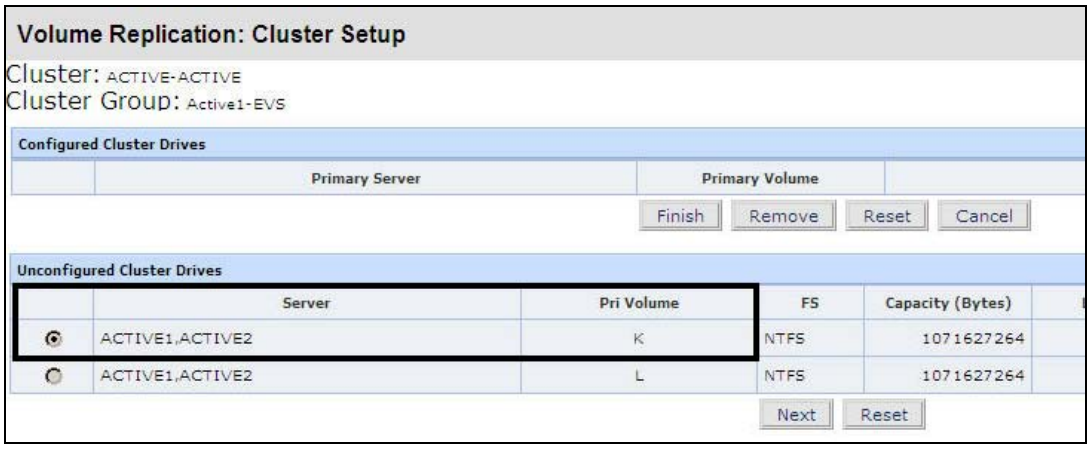


Figure 124:

Step 196. Expand the target host specific to the EVS to select the drive with same mapping and scroll down to set the "**Replication Options**".

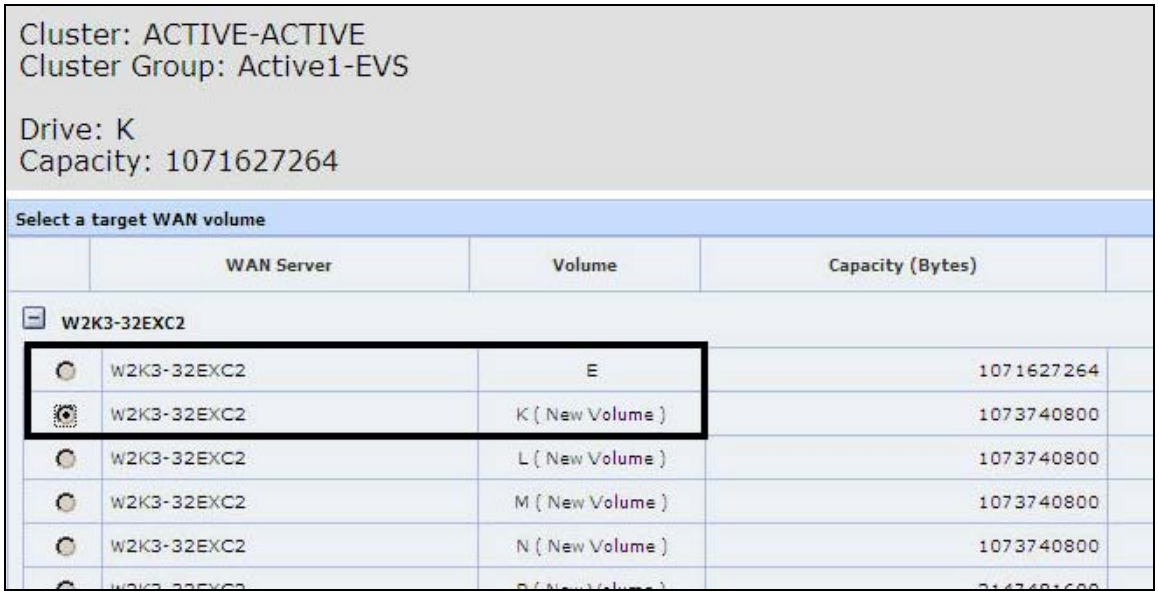


Figure 125:

Step 197. Ensure that the "**Enable CDP Retention option**" is enabled then click on "**Submit**"

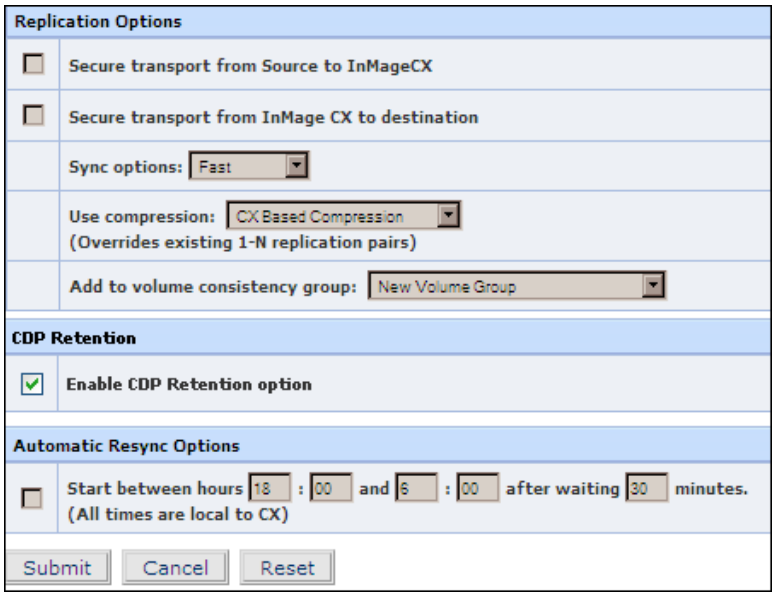


Figure 126:

Step 198. Select the type of retention policy to be applicable for this replication pair, then click on "**Submit**"

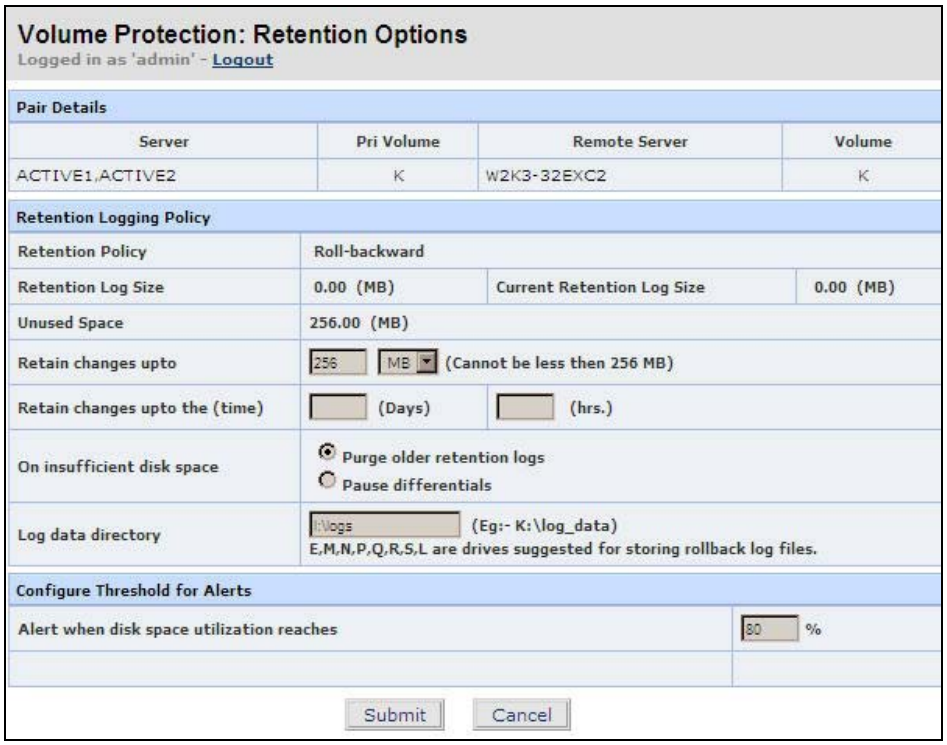


Figure 127:

Step 199. Select the entry representing the replication pair that is being configured as shown in the picture and click on "**Finish**" to start the replication pair.

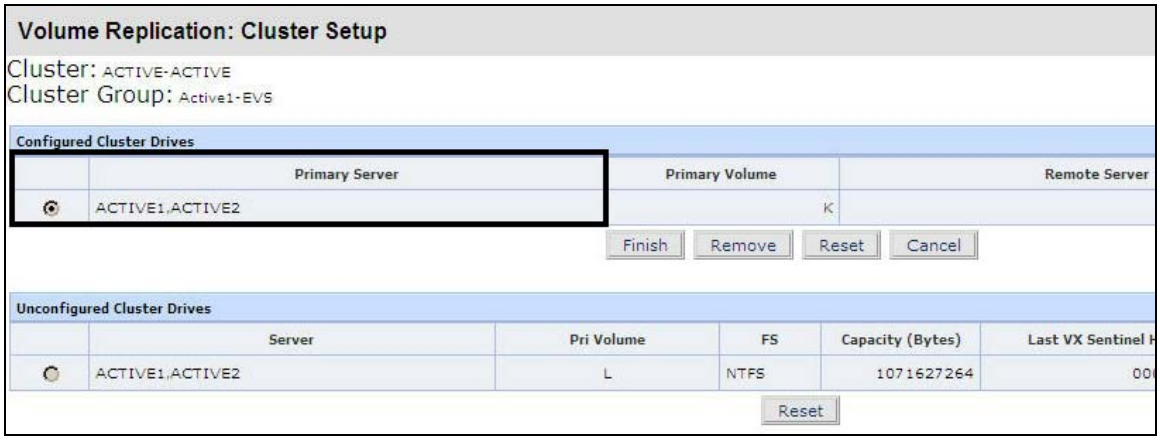


Figure 128:

16.2.2 Second EVS

Similarly replicate all other volumes belonging to other EVS.
You may monitor the replication pairs through **"Protection Status**" as shown below

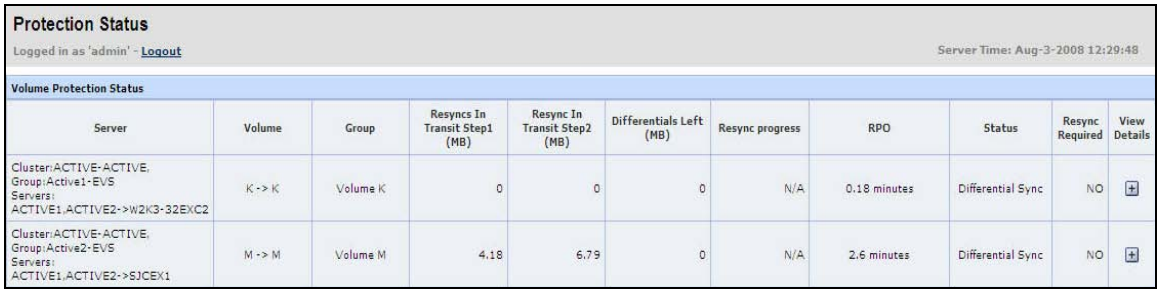


Figure 134:

16.3 Consistency

16.3.1 First EVS

Once all the volumes belonging EVS reach "**Differential Sync**", proceed to setup FX job for each of the EVS to issue consistency tags.

Step 200. Setup the FX job with source and destination as the active node for the EVS.
Select the FX template as "**Exchange Consistency"** and click on "**Next"** to continue

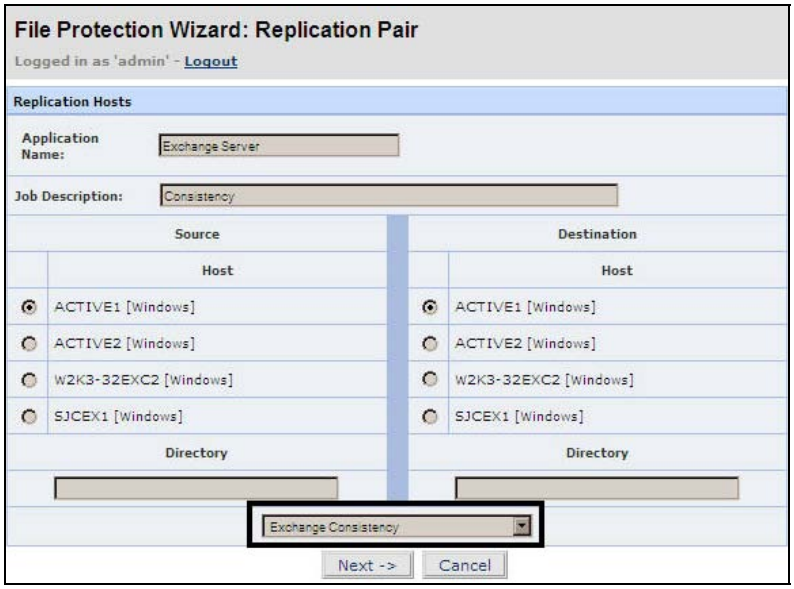


Figure 135:

Step 201. The "**Job Options"** screen opens up with all the fields filled up, scroll down, and click **"Finish"** to continue.

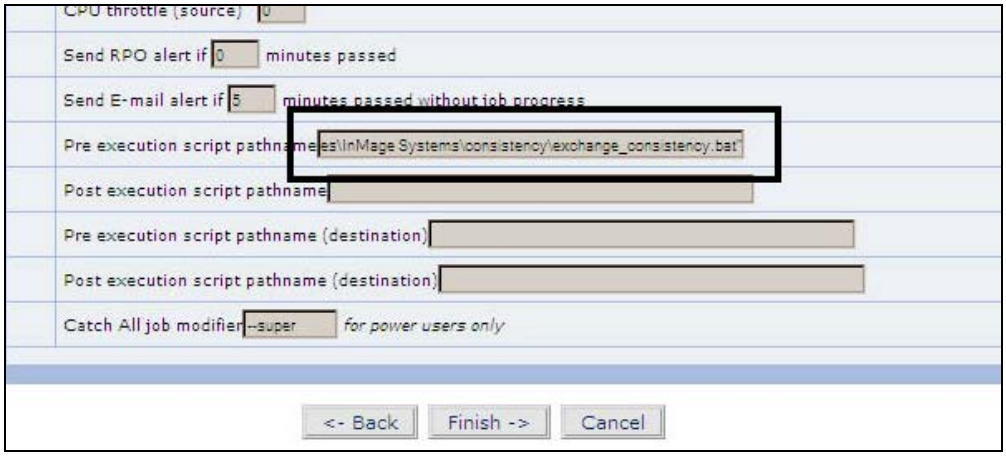


Figure 136:

Step 202. The job will be set to execute every six hours by default, you may choose to change the frequency by clicking on the "**Set Schedule".** Click "**Finish**" to continue.

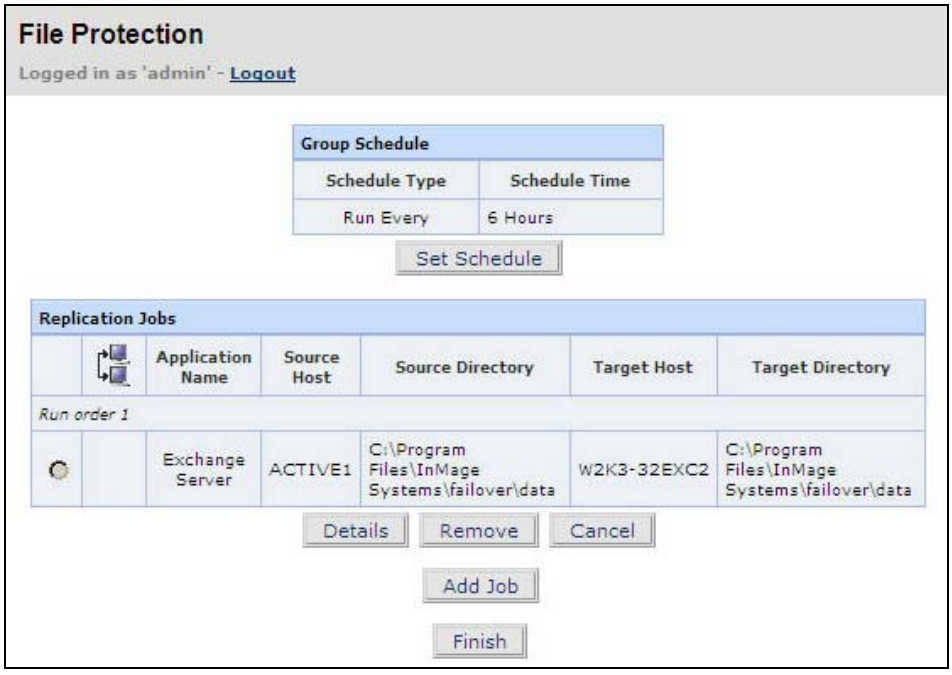


Figure 137:

16.3.2 Second EVS

Similarly set up consistency jobs for each of the EVS. You may monitor the status of all the FX jobs through "**Protection Status**"

File Protection Status

Filter	Job Description	Application	Status	Source Host	Source Directory	Target Host	Target Directory	Scheduled Type	GID	JID	Job Instance	Exit C
Set Clear		Select	Select						Select	Select		Select
⊞	exchange consist...	Exchange Server	Completed	ACTIVE2	C:\Program Files\InMage Systems\failover\data	SJCEX1	C:\Program Files\InMage Systems\failover\data	Run Every	6	6	16	0
⊞	Consistency...	Exchange Server	Completed	ACTIVE1	C:\Program Files\InMage Systems\failover\data	W2K3-32EXC2	C:\Program Files\InMage Systems\failover\data	Run Every	5	5	14	0
⊞	Exchange Discove...	Ungrouped	Completed	ACTIVE2	C:\Program Files\InMage Systems\failover\data	SJCEX1	C:\Program Files\InMage Systems\failover\data	On Demand	4	4	11	0
⊞	Exchange Discove...	Ungrouped	Completed	ACTIVE1	C:\Program Files\InMage Systems\failover\data	W2K3-32EXC2	C:\Program Files\InMage Systems\failover\data	On Demand	3	3	10	0

Figure 141:

17 Failover

Each EVS is failed over individually to achieve a complete failover. The EVS owning the MTA resource should be the last EVS to failover. To identify the EVS owning the MTA, open the Cluster Administrator and select each of the EVS to find the MTA resource under one of them as shown in the picture below.

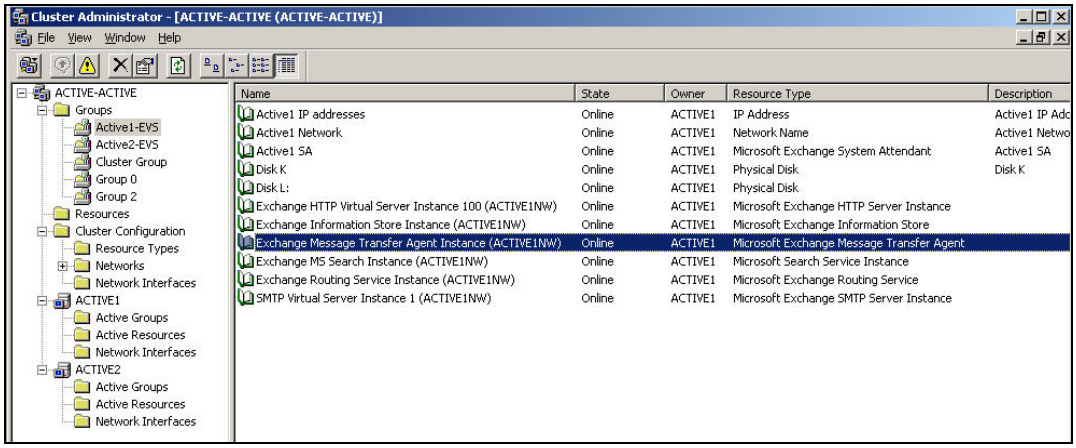


Figure 142:

Always failover the EVS without MTA resource and finally failover EVS with the MTA resource, this applies for both planned and unplanned failover.

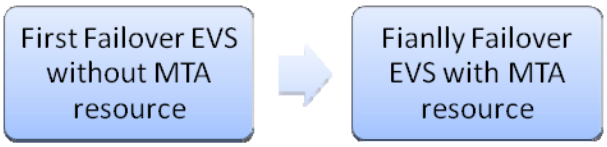


Figure 212

17.1 Exchange Planned Failover

17.1.1 Failover EVS without MTA resource

Step 203. Setup the FX job with the source as the active node on which the EVS is running and target as its corresponding target host and the FX template as "**Exchange Planned Failover**" and click on "**Next"** to continue.

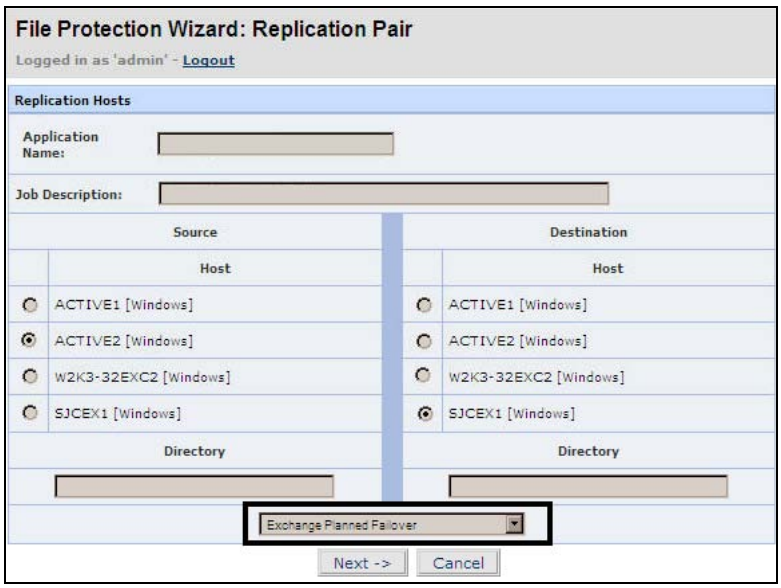


Figure 213

Step 204. The next screen appears with all the required fields filled up, scroll down to "**Miscellaneous Options"** to edit the source pre script and target post script with the switch **`-virtualserver`** **<***name of the virtual server to be failed over***>** **`-mta`** **<***name of the virtual server owning the MTA resource***>** and click "**Finish**"

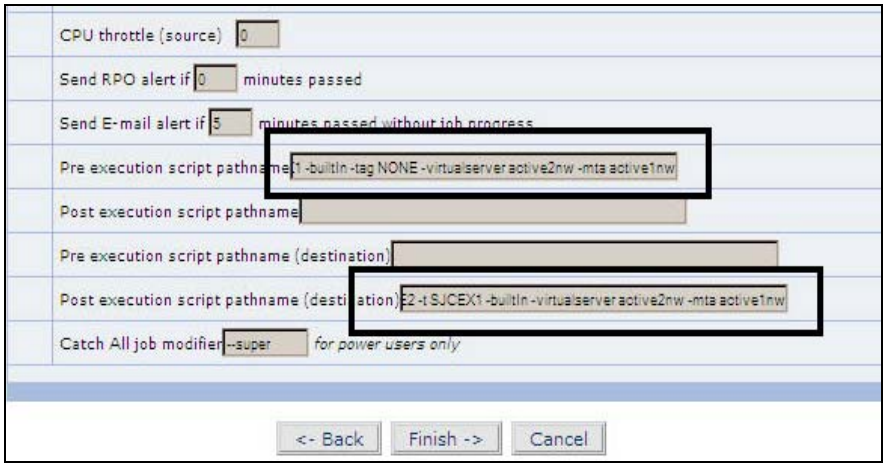


Figure 146:

Step 205. The job is set to execute "**On Demand".** Click "**Finish**" to save the job.

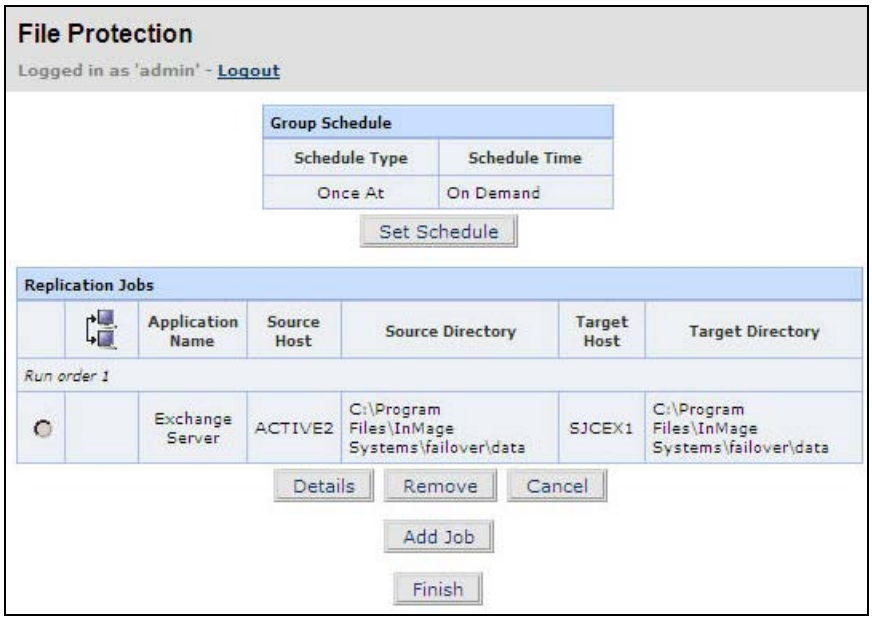


Figure 147:

Step 206. You may start the job from the "**File Protection**" to failover this EVS.

17.1.2 Failover EVS with MTA resource

Once all the other EVSs are failed over proceed to failover the last EVS containing the MTA resource.

Step 207. Open the CX user interface, click on "**File Protection**-> "**New Job Group Wizard**". Select the source as the active node on which the EVS is running and the target as it corresponding target host. Select the FX template as "**Exchange Planned Failover**" and click on "**Next"** to continue.

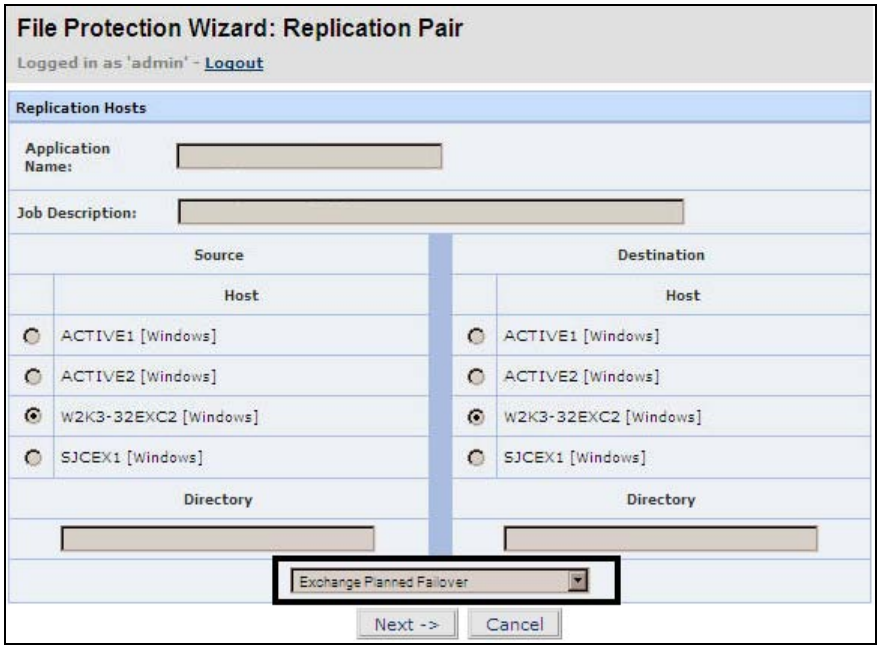


Figure 143:

Step 208. The "FX job Options" page opens up, scroll down to "Miscellaneous Options" and edit the source prescript and target post script with **`-virtualserver <`***name of the virtual server to be failed over***`> -mta <`***name of the EVS owning MTA resource***`>** then click on "Finish".

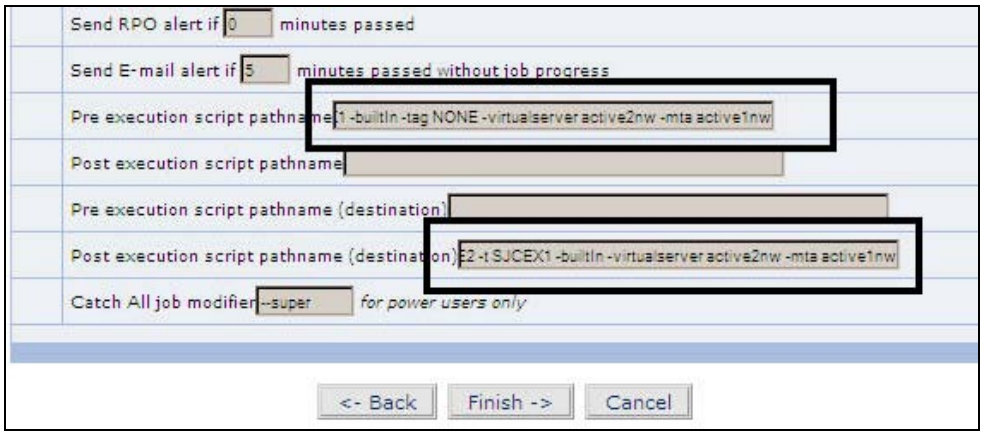


Figure 144:

Step 209. The job is set to execute "**On Demand"** and click on "**Finish"** to save the job.

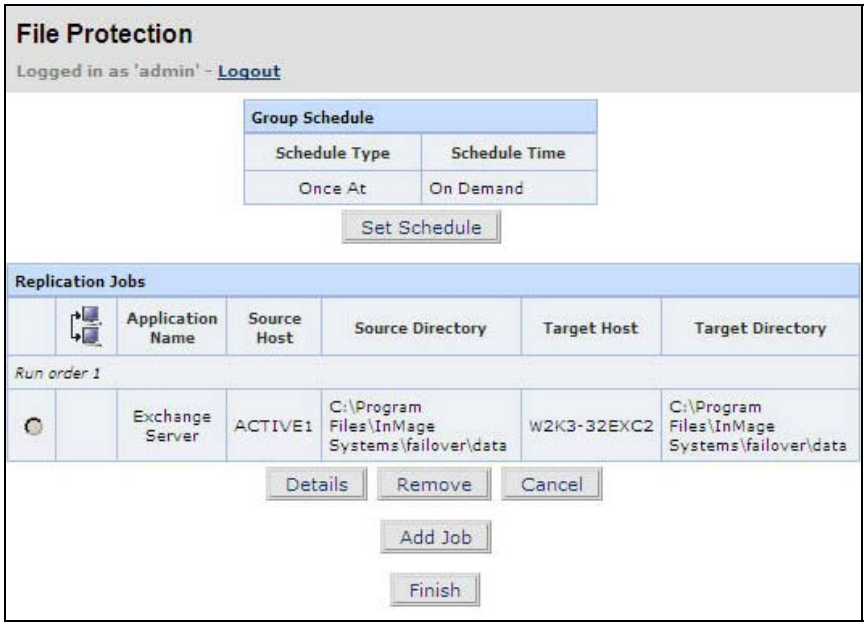


Figure 145:

Step 210. You may observe the progress of the job through "**Protection Status".** Once the EVS owning the MTA resource is failed over then all the EVS are successfully failed over.

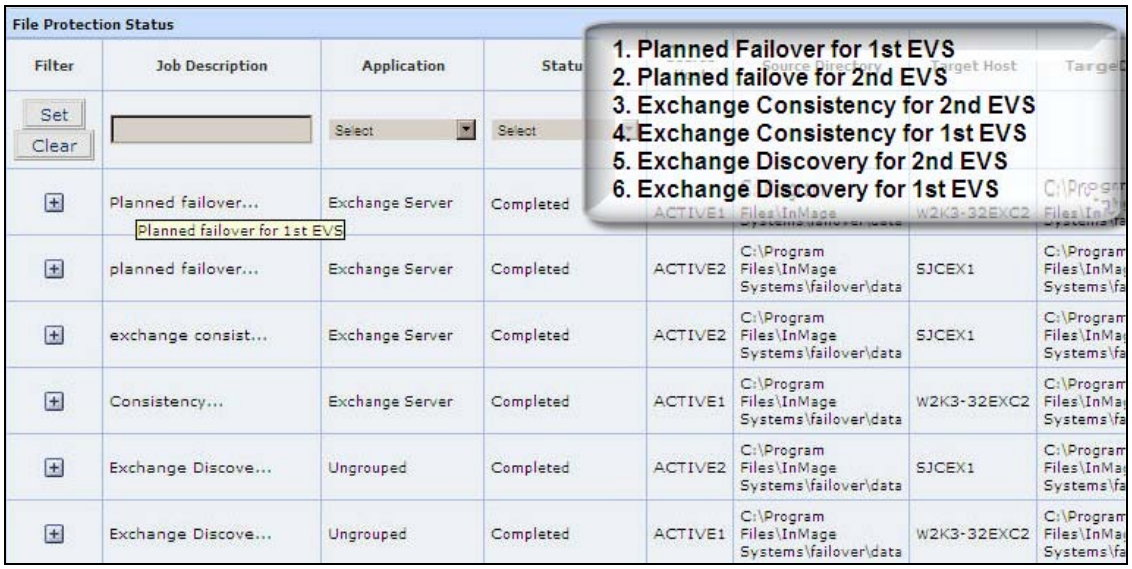


Figure 148:

17.2 Exchange Unplanned Failover

17.2.1 Failover EVS without MTA resource

Step 211. Setup the FX job with the source and destination as the target host. Select the FX template as "**Exchange Unplanned Failover**" and click on "**Next"** to continue.

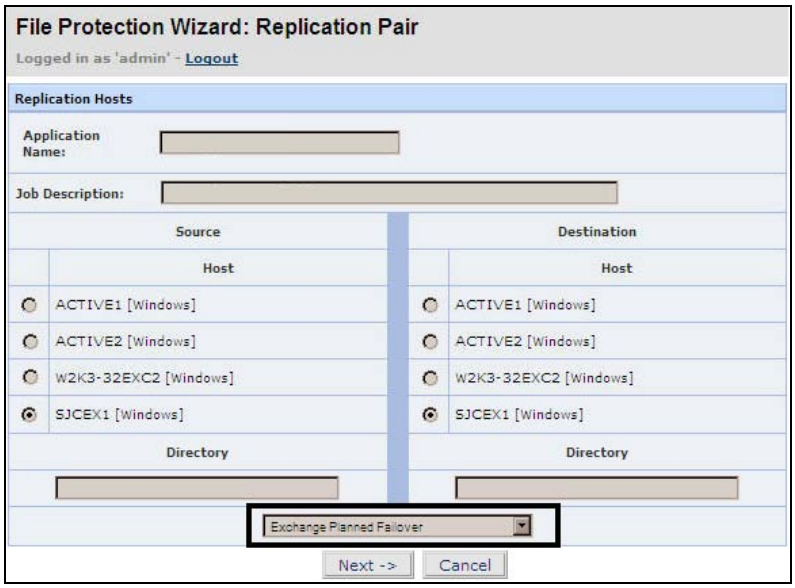


Figure 214

Step 212. The next screen appears with all the required fields filled up, scroll down to "Miscellaneous Options" to edit the target post script with the switch **`-virtualserver`** **<***name of the virtual server to be failed over***>** **`-mta`** **<***name of the virtual server owning the MTA resource***>** and click "Finish".

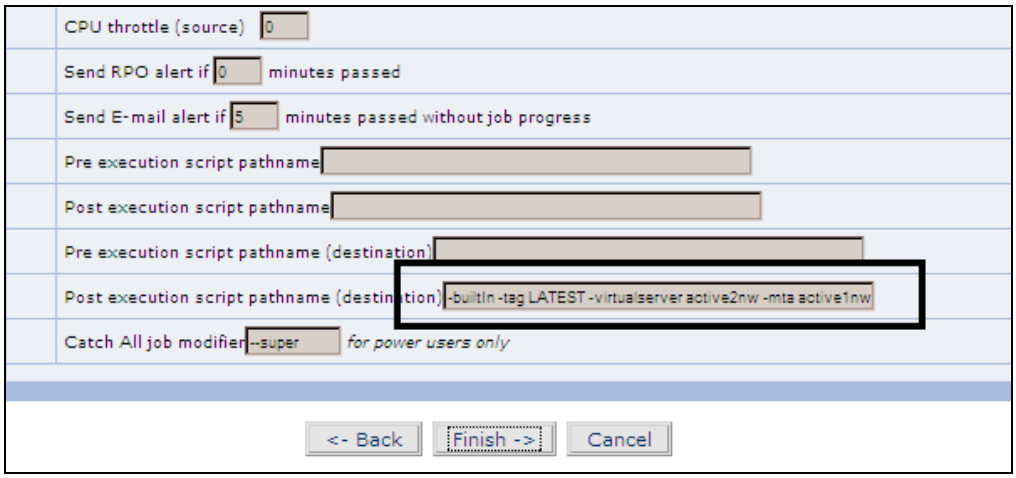


Figure 146:

Step 213. The job is set to execute "**On Demand".** Click "**Finish**" to save the job.

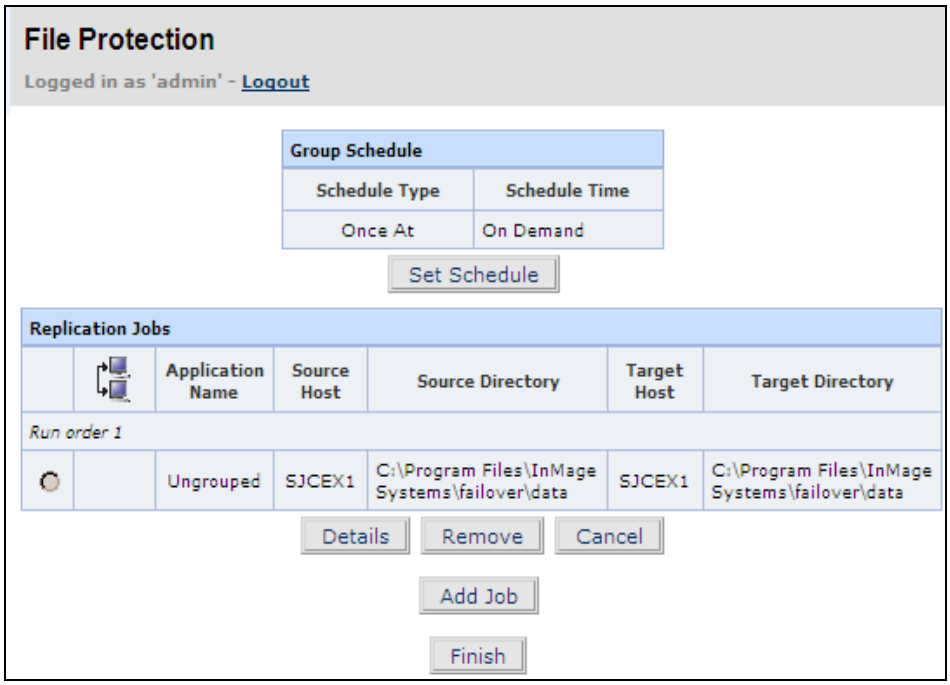


Figure 147:

Step 214. You may start the job from the "**File Protection**" to failover this EVS.

17.2.2 Failover EVS with MTA resource

Once all the other EVSs are failed over proceed to failover the last EVS containing the MTA resource.

Step 215. Open the CX user interface, click on "**File Protection**->**New Job Group Wizard**". Select the source and destination as the target host running owning MTA. Select the FX template as "**Exchange Unplanned Failover**" and click on "**Next"** to continue.

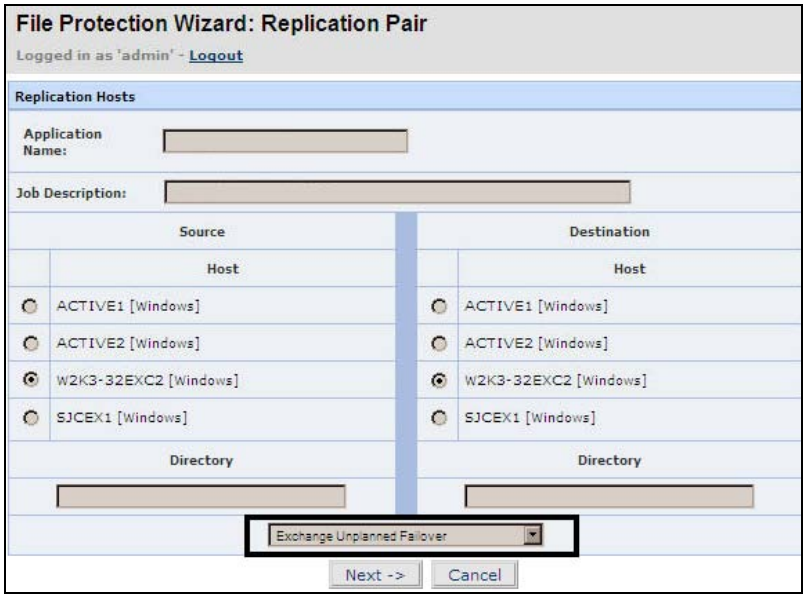


Figure 143:

Step 216. The "FX job Options" page opens up, scroll down to "**Miscellaneous Options**", and edit the source prescript and target post script with **`-virtualserver <`***name of the virtual server to be failed over***`> -mta <`***name of the EVS owning MTA resource***`>** then click on "Finish".

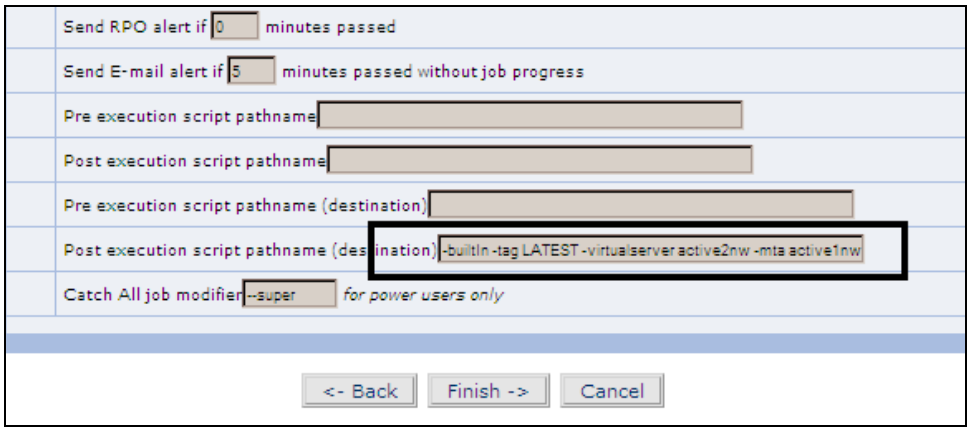


Figure 144:

18 Failback

A failback is performed once the production server is ready to resume operations. Failback is performed in eight steps as shown below.

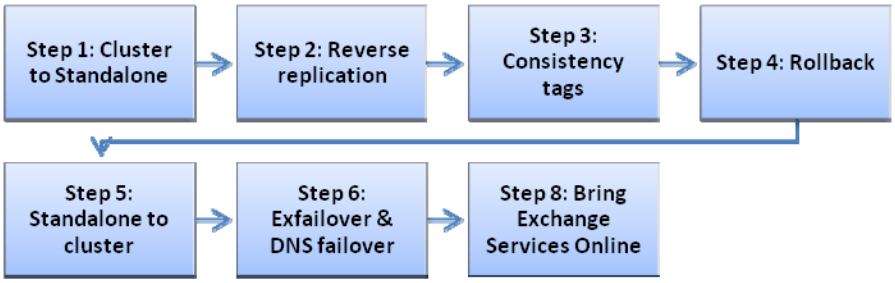


Figure 215

18.1 Step 1: Cluster to standalone

To update the production server with all the data changes occurred during its outage a reverse replication is performed. Both DR servers (each containing an EVS) will be replicated to the production server. Since volume replication requires the target volume to be locked while replication, the clustered production server will be converted into a standalone server. This is accomplished through the clusutil.exe tool under the VX agent installation path.

Step 217. To convert the clustered production server to a standalone server, access the active node of the production server then navigate to the VX agent installation path through the command prompt to issue the following command.

```
Clusutil –prepare ClusterToStandalone:<name of the active node> -
shutdown <name of the passive nodes>
```

```
C:\Program Files\InMage Systems>ClusUtil -prepare ClusterToStandalone:active1 -shutdown active2

Connected to [active2] SCM
Waiting for the service [svagents] to stop
Successfully stopped the service: [svagents]

Connected to [active1] SCM
Waiting for the service [svagents] to stop
```

Figure 216

Caution:

You will need to login with administrator privileges to execute the "**clusutil**"command.

This shuts down the rest of the nodes and turns the active node into a standalone server.

Notes:

For Windows Server 2008 cluster, you will need to perform onlinedisk operation after the node restarted as the result of the above step.

In Windows Server 2008 cluster, after server restarts, cluster disk will be offline and cannot be used until it becomes online. You may use the "ClusUtil.exe —prepare onlinedisk" command to bring all the disks online.

When you need only selected clustered disks online, you may access the cluster management interface and take the other disks offline

Switch to the CX UI to observe that the Cluster Group Volumes disappears and all the volumes will be shown belonging to the active node.

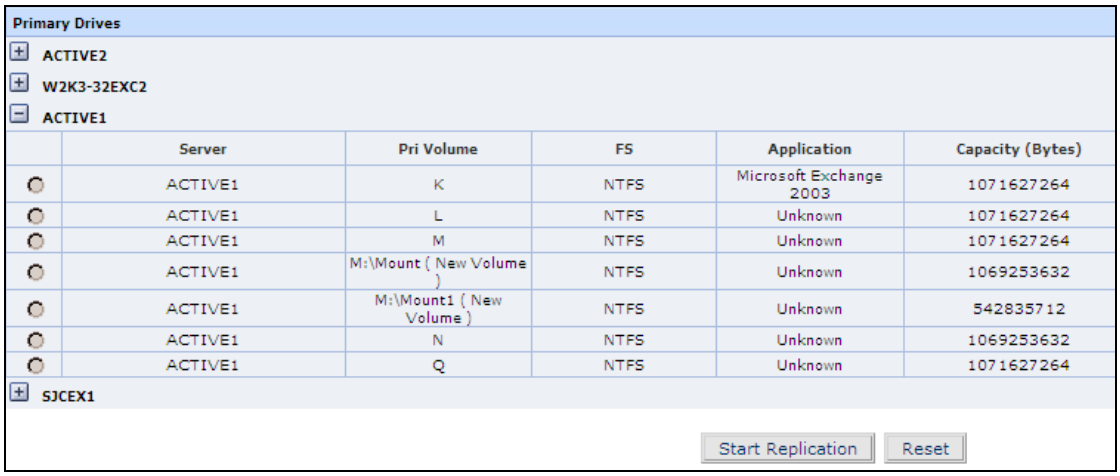


Figure 217

18.2 Step 2: Reverse replication

After failover each EVS is functional on its respective DR server. Therefore, a reverse replication is to be set from each of the DR server to the production server.

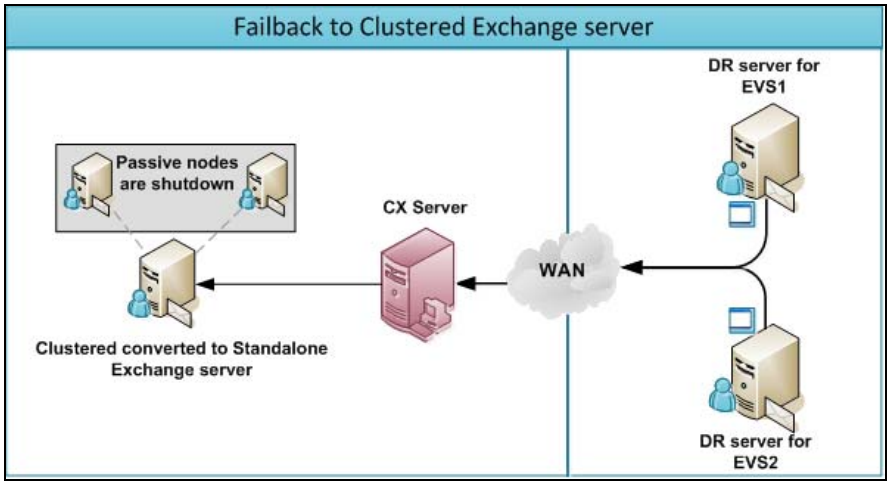


Figure 218

Now that the production machine appears like a standalone server, proceed to set reverse replications. The production machine will now act as a target for all DR servers.

Step 218. Access the CX UI, then expand the DR server for the EVS that is to be reverse replicated and select the volume. Observe that this was once a target volume. Click on "**Start Replication**".

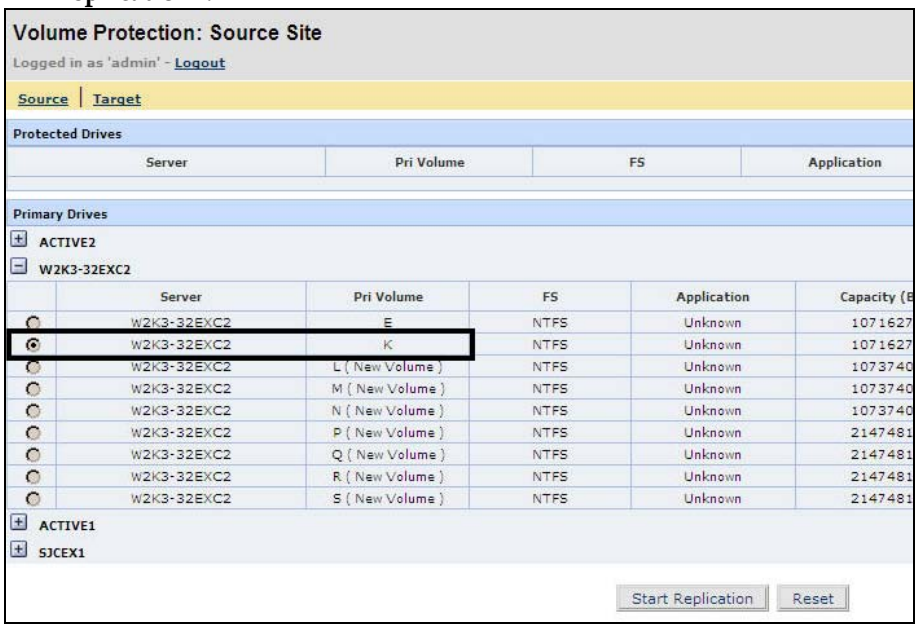


Figure 219

Step 219. The next screen opens up; expand the production server to select the target volume, which was once a source volume. Then scroll down to set the "**Replication Options".**

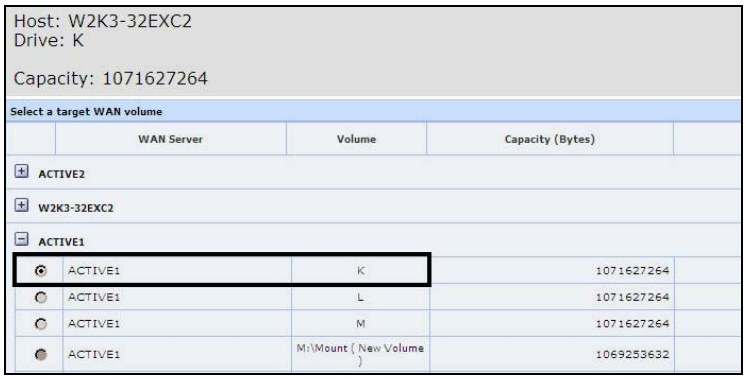


Figure 220

Step 220. Ensure that you check the "**Enable CDP Retention option**" then click on "**Submit"** to continue.

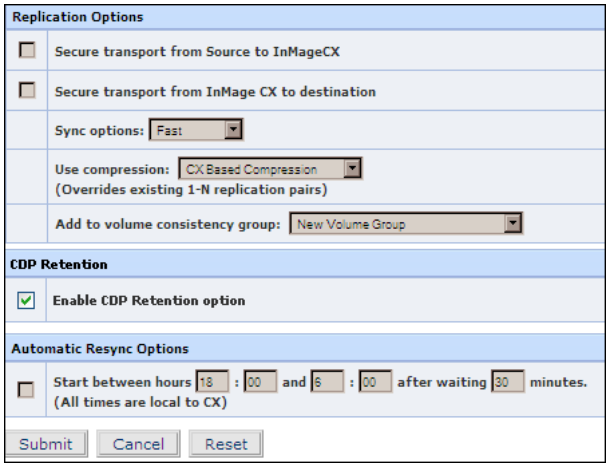


Figure 221

Step 221. Enter the type of retention policy applicable for the replication pair and click on "**Submit"** to start the replication pair.

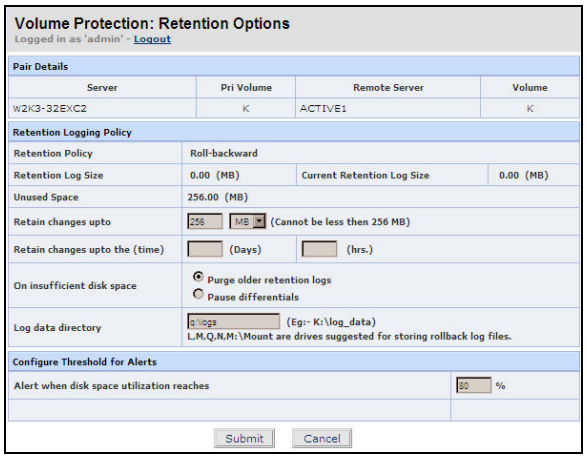
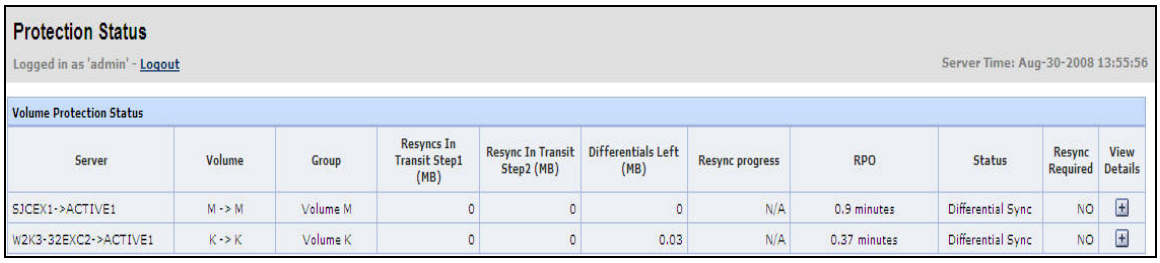

Volume Protection: Retention Options
Logged in as 'admin' - Logout
Pair Details
Server
Pri Volume
Remote Server
Volume
W2K3-32EXC2
K
ACTIVE1
K
Retention Logging Policy
Retention Policy
Roll-backward
Retention Log Size
0.00 (MB)
Current Retention Log Size
0.00 (MB)
Unused Space
256.00 (MB)
Retain changes upto
256
MB
(Cannot be less then 256 MB)
Retain changes upto the (time)
(Days)
(hrs.)
On insufficient disk space
Purge older retention logs
Pause differentials
Log data directory
q:\logs
(Eg:- K:\log_data)
L,M,Q,N,M:\Mount are drives suggested for storing rollback log files.
Configure Threshold for Alerts
Alert when disk space utilization reaches
80
%
Submit
Cancel

Figure 222

Step 222. Similarly, replicate all other EVS running on DR servers. Once all the replication pairs reach "**Differential Sync",** proceed to the next step.



Protection Status

Logged in as 'admin' - Logout

Server Time: Aug-30-2008 13:55:56

Volume Protection Status

Server	Volume	Group	Resyncs In Transit Step1 (MB)	Resync In Transit Step2 (MB)	Differentials Left (MB)	Resync progress	RPO	Status	Resync Required	View Details
SJCEX1->ACTIVE1	M -> M	Volume M	0	0	0	N/A	0.9 minutes	Differential Sync	NO	⊞
W2K3-32EXC2->ACTIVE1	K -> K	Volume K	0	0	0.03	N/A	0.37 minutes	Differential Sync	NO	⊞

Figure 223

18.3 Step 3: Consistency tags

Step 223. Stop the following exchange services on the source machines (DR servers). Some of these services do not exist in Exchange 2007 and will fail to stop, this may be ignored.

	Exchange 2003	Exchange 2007
Service names	MSExchangeMGMT	
	RESvc	
	MSExchangeIS	
	MSExchangeMTA	
	MSExchangeSA	

Notes:

If there are any dependency services, stop the dependencies and then stop the Exchange services.

Step 224. Then access the command prompt of each of the DR server to issue the following command under the VX agent installation path.

```
Vacp –v <volume> -t “<name of the consistency tag>”
```

```
C:\Program Files\InMage Systems>vacp -v k: -t "Tag_1"

Parsing command line arguments ....

Validating command line arguments ...
Generating Tag: Tag_1
Generating Tag: FileSystem48bbb91c
Generating "Revocation" tag ...
Preparing the applications for consistency ...
Preparing Files K:\* (recursively)
Starting snapshot set

Using MS Software Shadow Copy provider: b5946137-7b9f-4925-af80-51abd60b20d5
Freezing the applications for consistency ...
Commiting shadow copy for the set...
K:\ is mapped to Unique volume \\?\Volume{e874f89a-313d-4297-8271-fdc587d436de}\

Checking driver mode for given volumes

For volume K:\ driver is in Data mode.
Sending tags to the driver ...

Successfully sent tags to the driver ...
Marked all applications as successfully backed up
Resuming the applications after point-in-time consistency check-point
Deleting snapshot set(Shadow copies)
Succeefully deleted snapshot set(Shadow copies)
Exiting gracefully ...

C:\Program Files\InMage Systems>
```

Figure 224

18.4 Step 4: Rollback

Step 225. After issuing consistency tags on all source hosts (DR servers). Switch to the CX UI to perform a target volume rollback. Click on "**Recovery"** then select the replication pair you want to rollback and click on "**Rollback".** A message box appears for confirmation, click on "**OK"** to proceed.

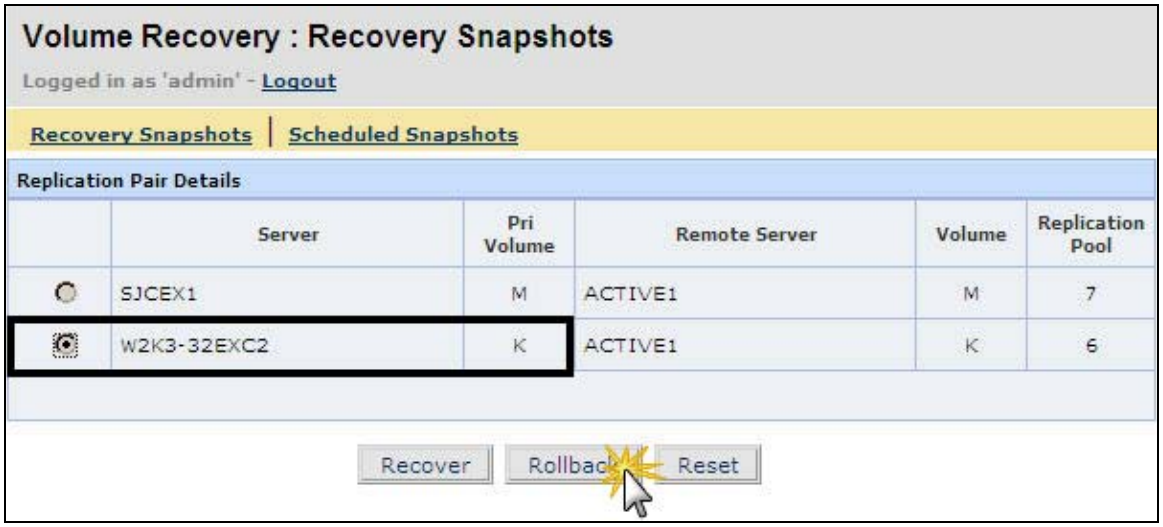


Figure 225

Step 226. The next screen opens up as shown in the picture below. Select the "**Using Application consistency & Event based**" option.

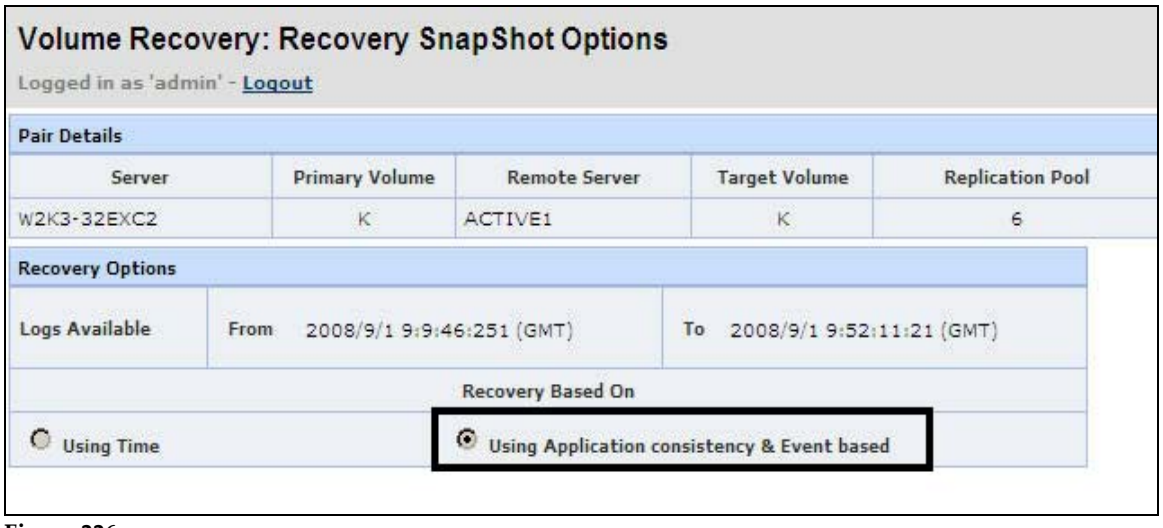


Figure 226

Step 227. The interface changes to the "**Search Result**" as shown below, select the consistency tag as issued in the step Consistency tags on page 156. Then click on "**Save**".

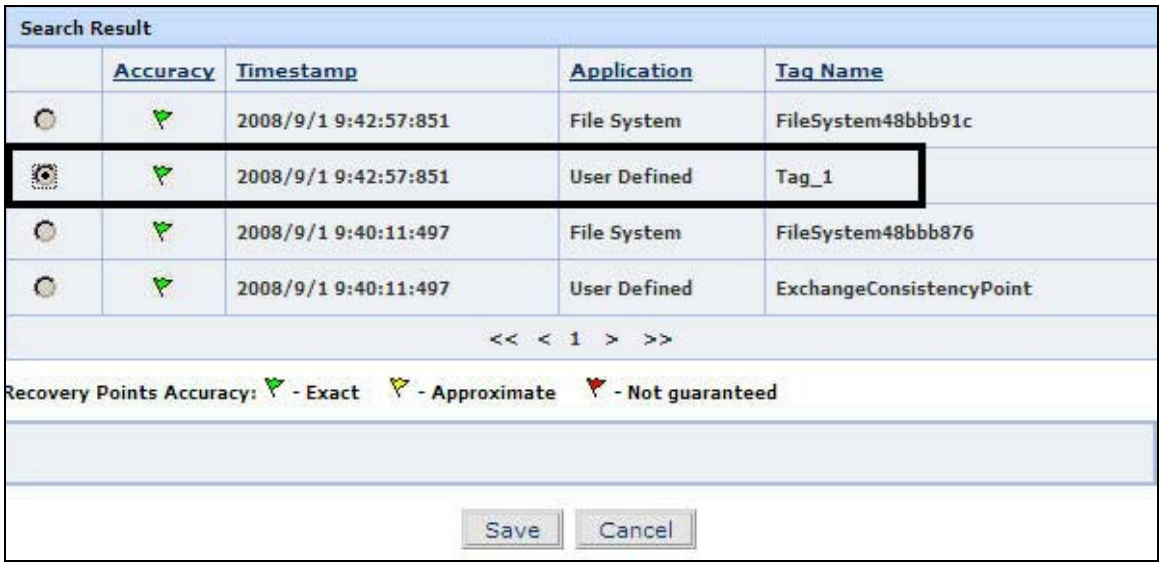


Figure 227

Step 228. This will break the replication pair and roll back the target volume to a consistent point. Similarly rollbacks all other reverse replication pairs.

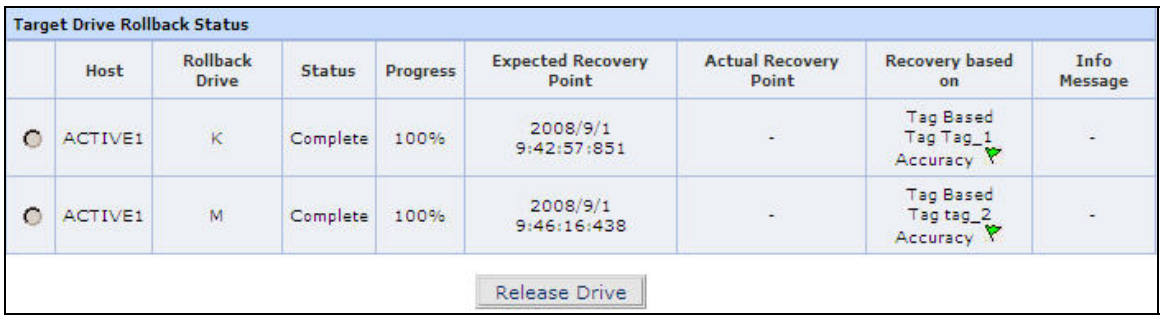


Figure 228

18.5 Step 5: Standalone to cluster

Now that the production server is updated, restore the production server back to its clustered state. Navigate to the VX agent installation path to issue the following command

`Clusutil.exe –prepare StandaloneToCluster:<name of the active node>`

The command reboots the machine and then starts all the passive nodes that were earlier shutdown.

18.6 Step 6: Migration & DNS Failback

Step 229. Once the production machine comes up, access the command prompt and navigate to the VX agent installation path to issue the following command

`Exfailover –failback –s <`*name of the DR server*`> -t <`*name of the production server*`> –autorefine –mta <`*host where MTA is running*`>`

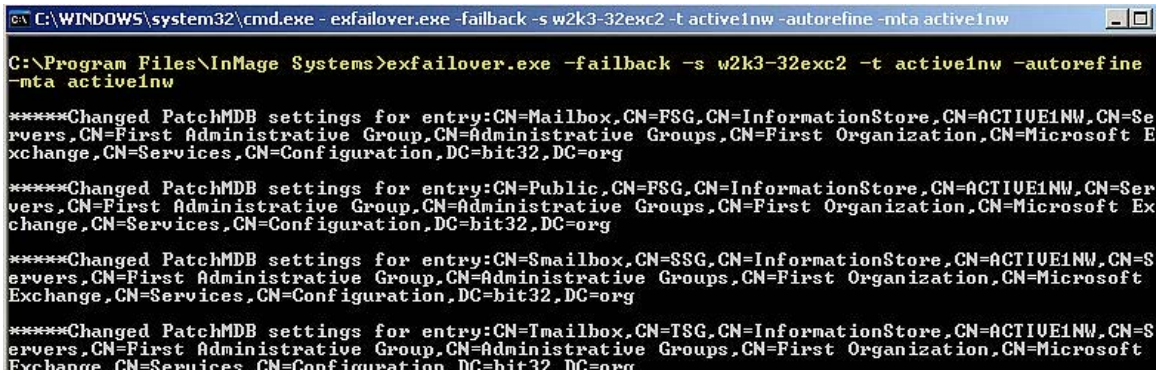


Figure 229

This will failover all exchange services to the production server. However, all the clients will still be pointed to the DR servers. A DNS failback is performed to restore the original IP address to the EVS.

You can add the "**-dryrun**" switch to see if the command will be successful before going ahead with the Exfailover

Step 230. To restore the DNS entries, a DNS failback is performed. Access the command prompt of the production server and navigate to the VX agent installation folder to issue the following command

`Dns –failback –host <`*name of the EVS*`> -IP <`*original EVS IP address*`>`

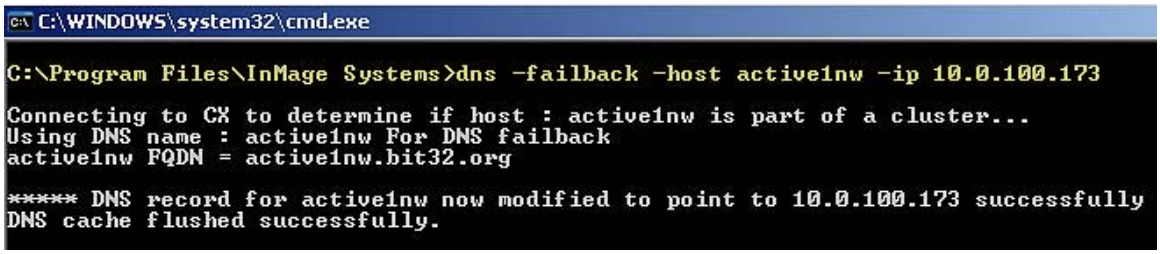


Figure 230

18.7 Step 7: Bring all EVS Services Online

Step 231. Open cluster administrator on the production server and "**Bring online"** the group owning MTA resource through cluster administrator. This concludes failback.

Part 4: Clustered Production Server and Clustered DR Server

This part explains protecting exchange server in a clustered environment where both production server and DR server are in clustered environment. This is applicable for Exchange Server 2003 only.

19 Introduction

A clustered Exchange server can contain more than one Exchange Virtual Server (EVS). Each EVS may again span over many volumes. To protect a clustered machine with multiple EVS to another identical clustered machine, ensure that you follow the below aspects while preparing the DR cluster machine

- Prepare the list of EVS on the production cluster and create the corresponding EVS on the DR cluster.
- Create the list of volumes used by each production EVS and assign the same drive letters for the DR EVS. These volumes will later be used as target volumes for the respective EVS

20 Prepare target cluster

A clustered machine cannot be used as a target host for a replication. The DR cluster should be converted to a standalone server. Follow the below steps to prepare the DR cluster server before setting a VX replication.

Step 232. Create the same number of EVS on the DR cluster as on the production cluster

Step 233. Ensure that each EVS created on the DR cluster is similar to its corresponding EVS on the production cluster in terms of volumes occupied, size of volumes, drive mapping etc.

Step 234. Take the system attendant resource offline for both the EVS on the DR cluster

Step 235. List the volumes belonging to each of the EVS on the DR cluster server

Step 236. Get the MS Search Instance folder path by running the following command:

```
Cluster.exe resource "<MSSearch Instance resource Name>" /priv
```

Take back up of MS Search Folder to Hitachi Dynamic Replicator VX installation path.

Step 237. Login to the active node of the DR cluster and navigate to the Hitachi Dynamic Replicator VX agent directory through the console and execute the clusuti.exe command to convert the active node into a standalone server

```
clusutil.exe -prepare clustertostandalone:<active node name> -shutdown
<passive nodes>
```

Notes:

For Windows Server 2008 cluster, you will need to perform onlinedisk operation after the node restarted as the result of the above step.

In Windows Server 2008 cluster, after server restarts, cluster disk will be offline and cannot be used until it becomes online. You may use the "ClusUtil.exe –prepare onlinedisk" command to bring all the disks online.

When you need only selected clustered disks online, you may access the cluster management interface and take the other disks offline

Caution:

Back up of MS Search Folder should be taken before converting the target cluster to standalone target, because this folder contains configuration files which are very important for Exchange Virtual Sever. Without backup of this folder EVS will not come online after failover.

21 Protect

Set VX replication pairs from production cluster to standalone DR server. Ensure that you replicate all production EVS to their corresponding volumes on the DR production server with CDP retention enabled. Configure consistency job from all clustered nodes on the production cluster to the standalone DR server.

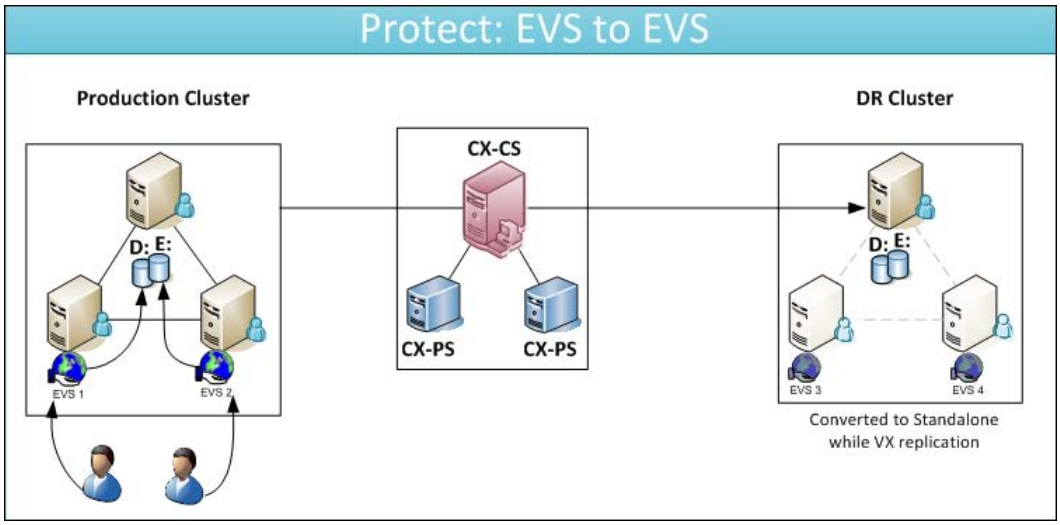


Figure 231

22 Planned Failover

You can perform a planned failover in six steps explained below. During these steps the standalone DR server will be restored back to its clustered state and users are diverted directly to the EVS on the DR cluster transparently.

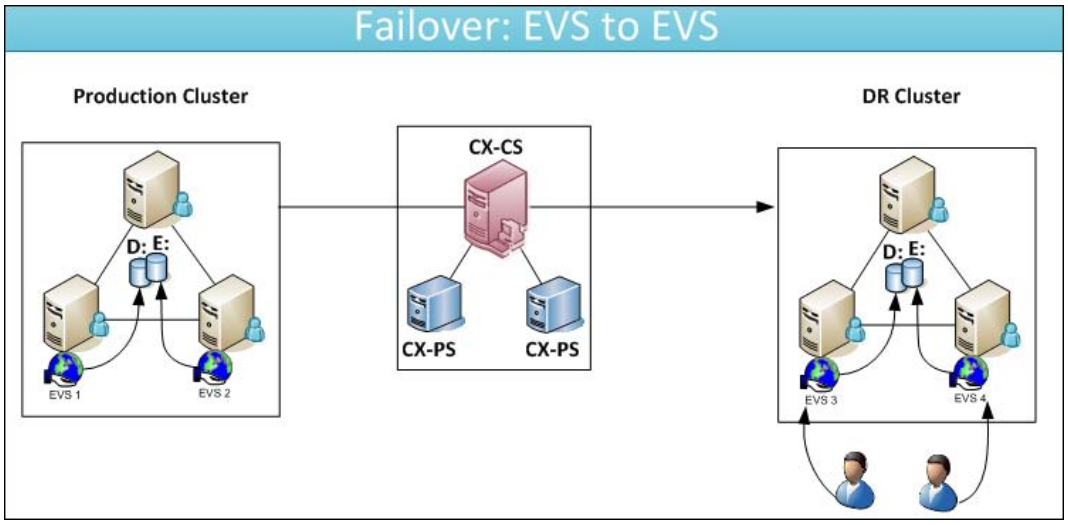


Figure 232

Follow the below steps to perform a planned failover

Step 238. Take the system attendant resource offline on the production cluster for all the EVS to stop the further data writes.

Step 239. Issue consistency tag for each of the EVS running on the production cluster. Access the respective node for each EVS to issue a vacp tag.

```
vacp -v <EVS Volumes>  -t "<name of the tag>"
```

For Example:

```
vacp -v K:;M:;L:\Mount1 -t "tag1"
```

Step 240. Switch back to the CX UI to roll back the target volumes to the consistency tag issued in the previous step

Step 241. Access the standalone DR server to convert it back to its clustered state. You can do this using the clusutil.exe command found under the VX install directory.

```
clusutil.exe -prepare standalonetocluster:<standalone DR server>
```

Step 242. After the active DR server comes up start the passive nodes manually.

Step 243. Restore back the MS Search Instance Folder to original target location with same drive letters.

Step 244. Then perform exchange failover through the "exfailover" command for each of the EVS on the DR cluster nodes. Access the production cluster through console for each of the EVS and navigate to the VX installation path to issue the following command

`exfailover.exe -failover -s <`*Source EVS name*`> -t <`*corresponding target EVS on DR cluster*`> -autorefine -cs`

This step is performed for each of the EVS on the production cluster

Step 245. Perform a DNS failover for each EVS.
`Dns.exe -failover s <`*Source EVS name*`> -t <`*corresponding Target EVS name*`>`

Step 246. Bring the cluster resources online for all the EVS on the DR cluster

23 Failback

Note down the volumes of corresponding Source EVS

Step 247. Convert the production cluster to a standalone server. This enables the production server to act as a target host for the reverse replication (For more details refer section Prepare target cluster). Access the active node of the production cluster and navigate to the VX installation directory to issue execute the clusutil.exe command

`clusutil.exe -prepare clustertostandalone: <`*active node on production cluster*`> -shutdown <`*passive nodes on production cluster*`>`

Step 248. Set VX replications from DR Cluster to Standalone production server for each of the EVS. Ensure that you maintain drive mapping while selecting the target volumes for replication. For example, when EVS 3 is using e: volume on the DR cluster server, ensure that it's target volume on the production standalone server is also e:

Similarly set reverse VX replication pairs for the rest of the EVS.

Step 249. Once the replication pairs reach "**Differential Sync**", configure exchange consistency job from Active node on DR cluster to the standalone production server.

Take the system attendant resource offline on DR cluster for all EVS

Step 250. Issue consistency tags for all the Exchange volumes using vacp.exe.

`Vacp –v <EVS Volumes> -t <Tag Name>`

For Example:
`vacp -v K:;M:;L:\Mount1 -t "tag1"`

Step 251. Switch back to the CX UI to roll back the target volumes to the consistency tag issued in the previous step

Step 252. Convert the standalone production server back to a clustered machine using clusutil.exe.

```
clusutil.exe -prepare standalonetocluster:<Production Server Name>
```

Step 253. After the active production server comes up start the passive nodes manually.

Step 254. Restore back the MS Search Instance Folder to original target location with same drive letters.

Step 255. Perform Exchange failback for each of the EVS using the following command

```
exfailover.exe -failover -s <TargetEVS> -t <SourceEVS> -autorefine -cs
```

Step 256. Perform DNS failback for each of the EVS

`dns.exe -failback -host <`*SourceEVS*`> -ip <`*SourceEVS IP Addresses*`>`

Step 257. Bring all cluster resources online for EVS on the production cluster.

Part 5: Exchange Log Rotation

This part of the document explains Exchange log rotation. Exchange log rotation is a performance tuning job that executes at regular intervals. In each pass exchange logs files are removed from the production exchange server.

24 Introduction to Exchange Log rotation

Exchange server 2003 produces log files during its operations, eventually these log files consume disk space. To maintain free space these log file can be deleted. However, deleting them directly is not recommended. This solution explains how to rotate exchange log files with simple FX jobs.

This flushes all exchange data in the memory to disk and the VX replication transfers these files to the backup exchange server. Then log files on production and backup server are compared and then removed from the production server.

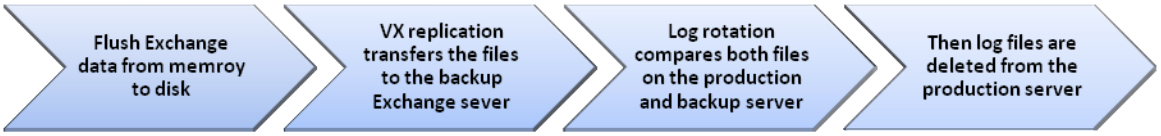


Figure 149: Exchange log rotation workflow

25 Configuring FX jobs

Three FX jobs are used for Exchange log rotation.

- The first FX job is for generating Exchange consistency tags.
- The second FX job will be in a different job group and will take a virtual snapshot based on the tag issued earlier to validate exchange log files.
- The third and final FX job will be within the same job group as the previous FX job (Exchange consistency Validation) and is responsible for rotating Exchange logs on the production exchange server.

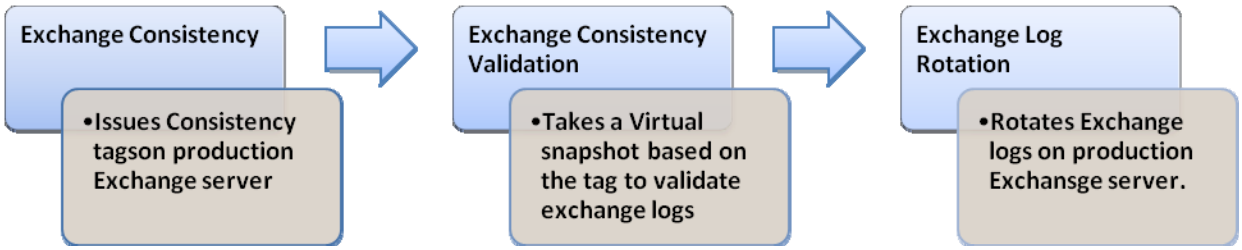


Figure153:

25.1 Exchange Consistency

Step 258. On the CX UI click on "**File Protection -> New Job Group Wizard -> Add Job".** Select the source and destination as the production exchange server, then select the FX template as "**Exchange Consistency"** and click on "**Next".**

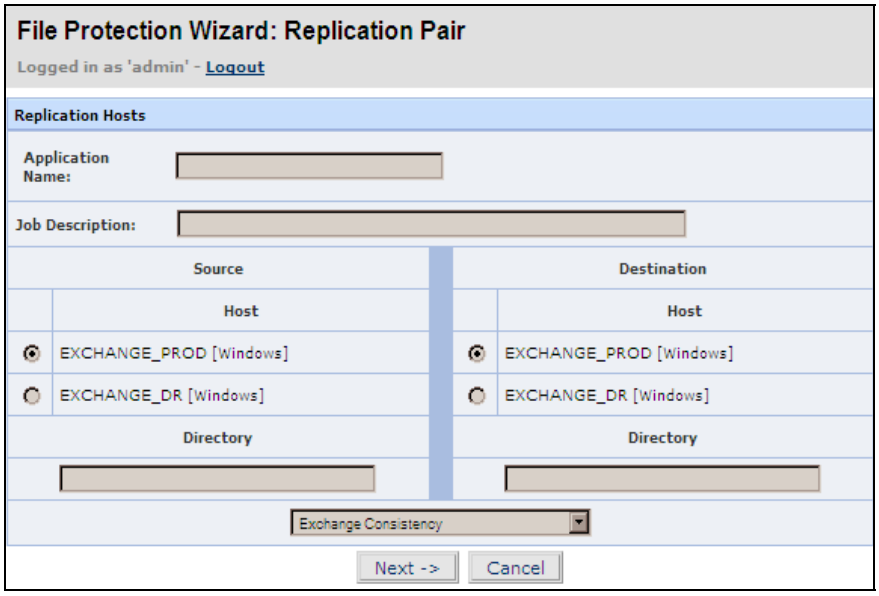


Figure 233:

Step 259. The FX job Options page appears, scroll down and click on "**Finish**".

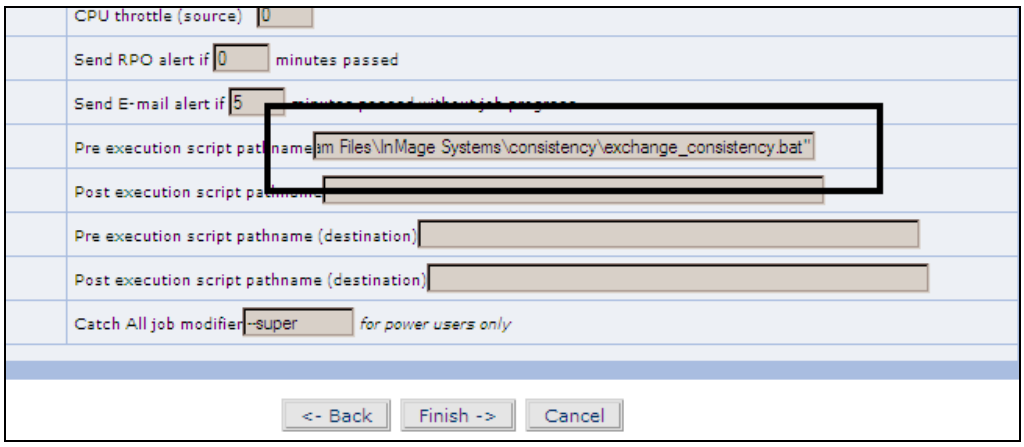


Figure 234:

25.2 Exchange Consistency Validation

Step 260. Click on "**File Protection -> New Job Group Wizard -> Add Job**", select the source and target exchange servers then select "**Exchange Consistency Validation**" for the FX template and click on "**Next".**

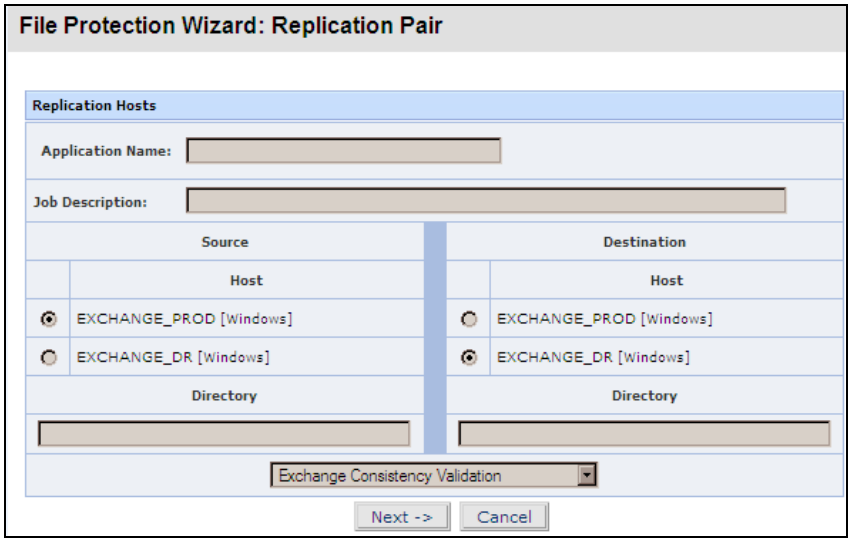


Figure 235:

Step 261. The FX job options page opens up with both the target pre script and target post script filled up. Click on "**Finish**" without changing any settings.

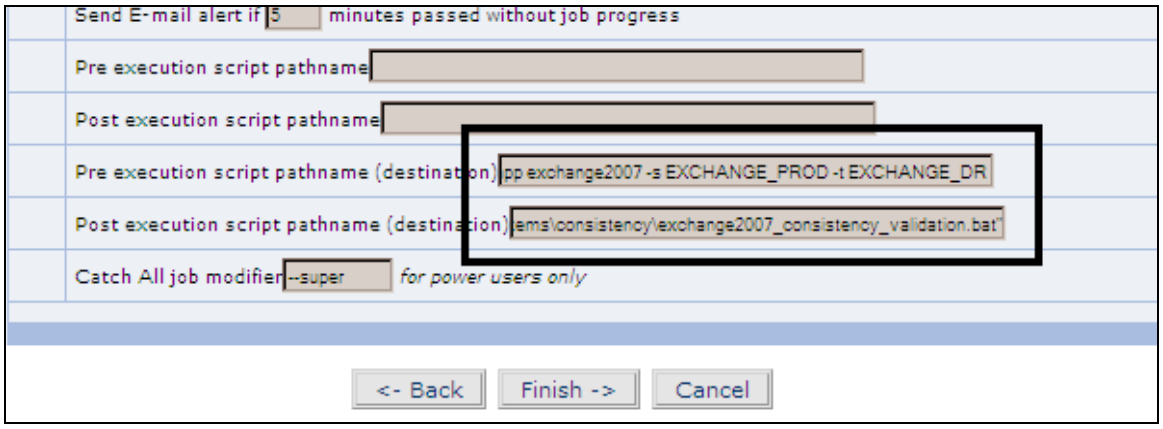


Figure 157:

Step 262. The job will be set to "**Run On Demand"**, Click on "**Add Job"**.

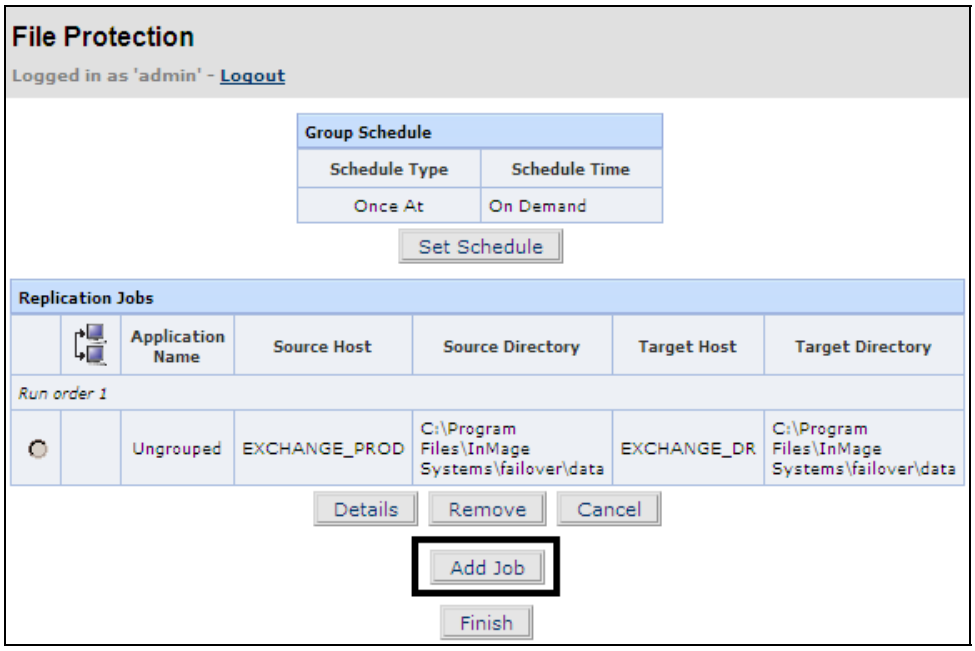


Figure 236

25.3 Exchange Log Rotation

Step 263. Now add another FX job under the same job group. This is a reverse replication. Setup a replication pair from target exchange server to source exchange server. Select the FX template as "**Exchange Log Rotation**" and click on "**Next".**

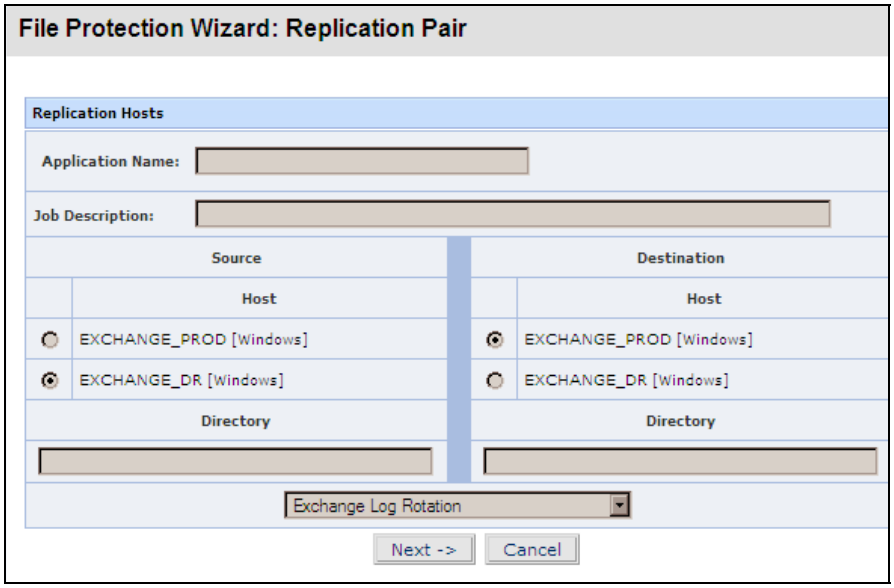


Figure 237

Step 264. The "**FX job Options**" page opens up, scroll down and click on "**Finish".**

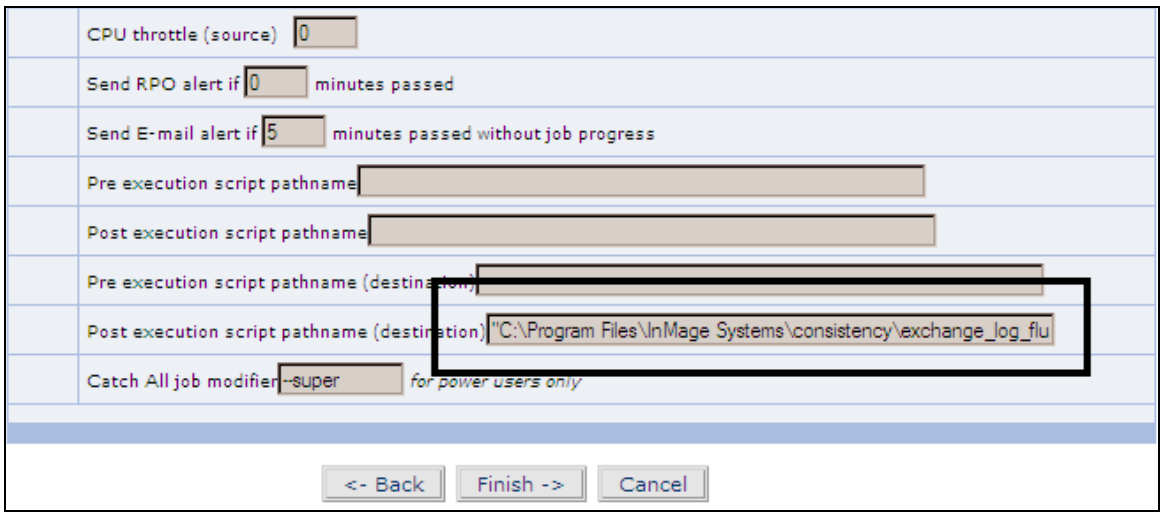


Figure 238

Step 265. Set the Run order for Exchange log rotation as "**Run Order 2".**

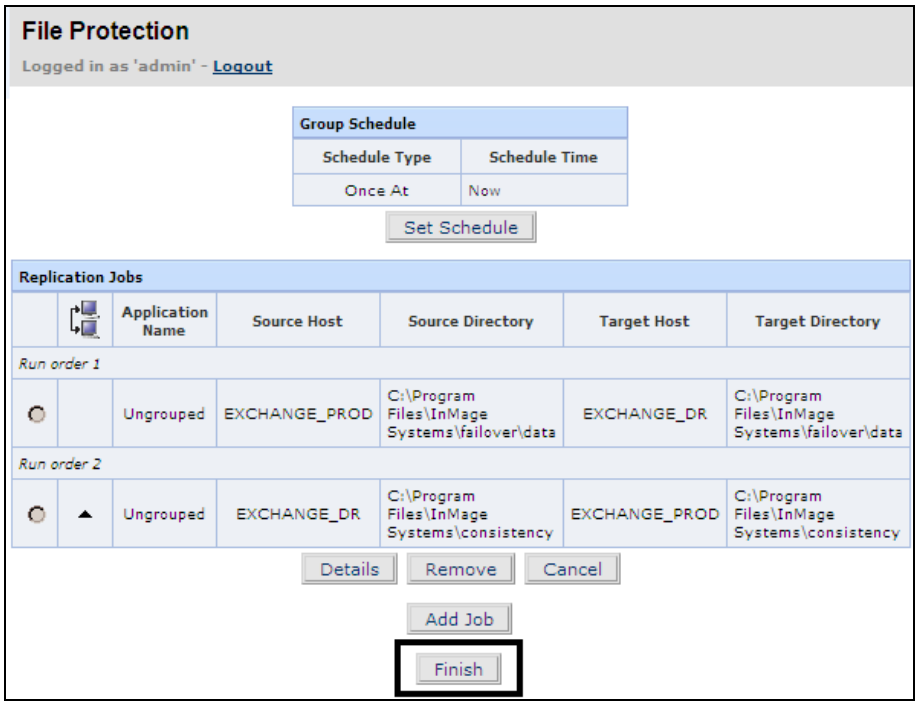


Figure 239

Step 266. Once both the FX jobs are complete, the logs are successfully rotated on the production exchange server.

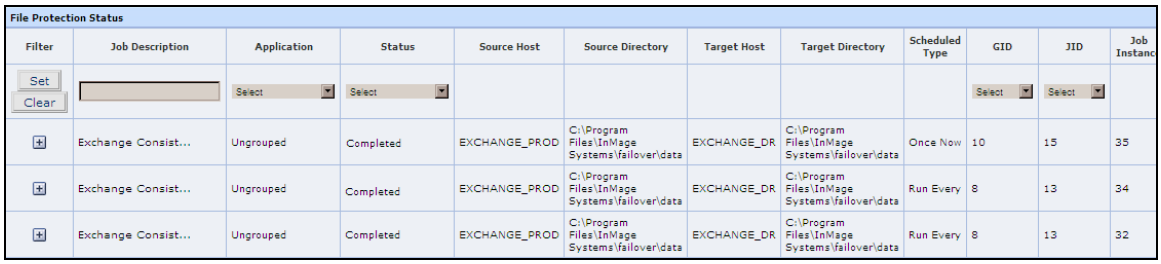


Figure 161:

Part 6: Troubleshooting

This part describes the process to recover from an inconsistent Exchange server database.

26 Recovering from Inconsistent Exchange Databases

There are instances when the exchange database and log files are not consistent on the target exchange server upon a disaster. Microsoft exchange databases can be recovered to a consistent point by using two utilities called “eseutil” and “isinteg”, they are available with Exchange installation. Following is a set of steps that can be followed to bring the exchange database(s) to a usable state. This must be executed on the target exchange server where you wish to recover the database files. The following assumes G and H drives are being used for exchange database and log volumes respectively, and “priv1.edb/priv1.stm” and “publ.edb/pub1.stm” are the names of the private and public database/stm files respectively.

```
net stop svagents
net stop MSExchangeIS

cd “C:\Program Files\InMage Systems”

Cdpcli -- unhide_rw G:
Cdpcli -- unhide_rw H:

chkdsk /f G:
chkdsk /f H:

cd “C:\Program Files\Exchsrvr\bin”
```

Eseutil /mh “G:\db1\priv1.edb”
Eseutil /mh “G:\db1\pub1.edb”

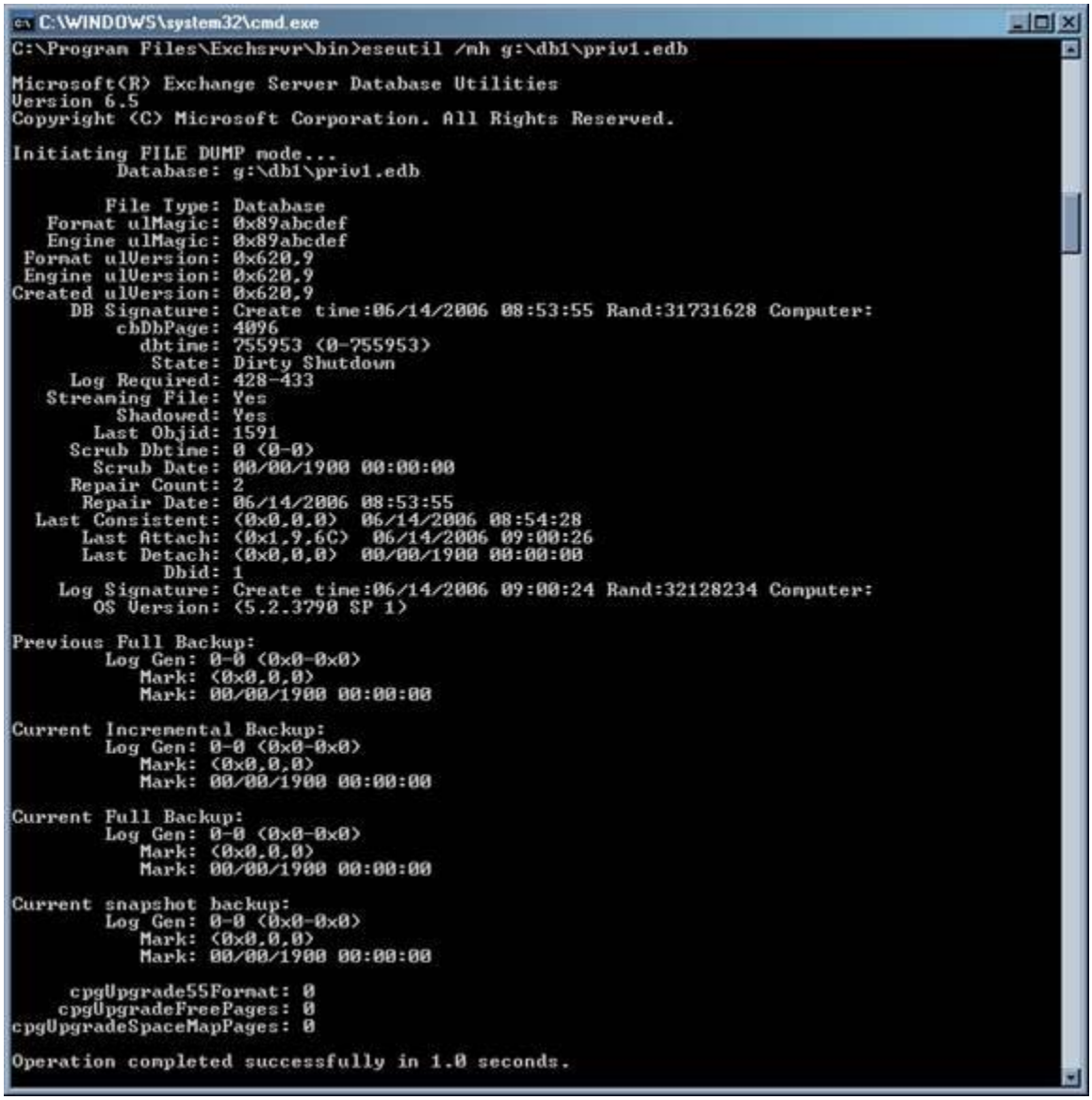


Figure 162:

Eseutil /r Exx /l”H:\logs1” /s”H:\logs1” /d”G:\db1 /i”

Eseutil /p “G:\db1\priv1.edb” /s”G:\db1\priv1.stm” /i

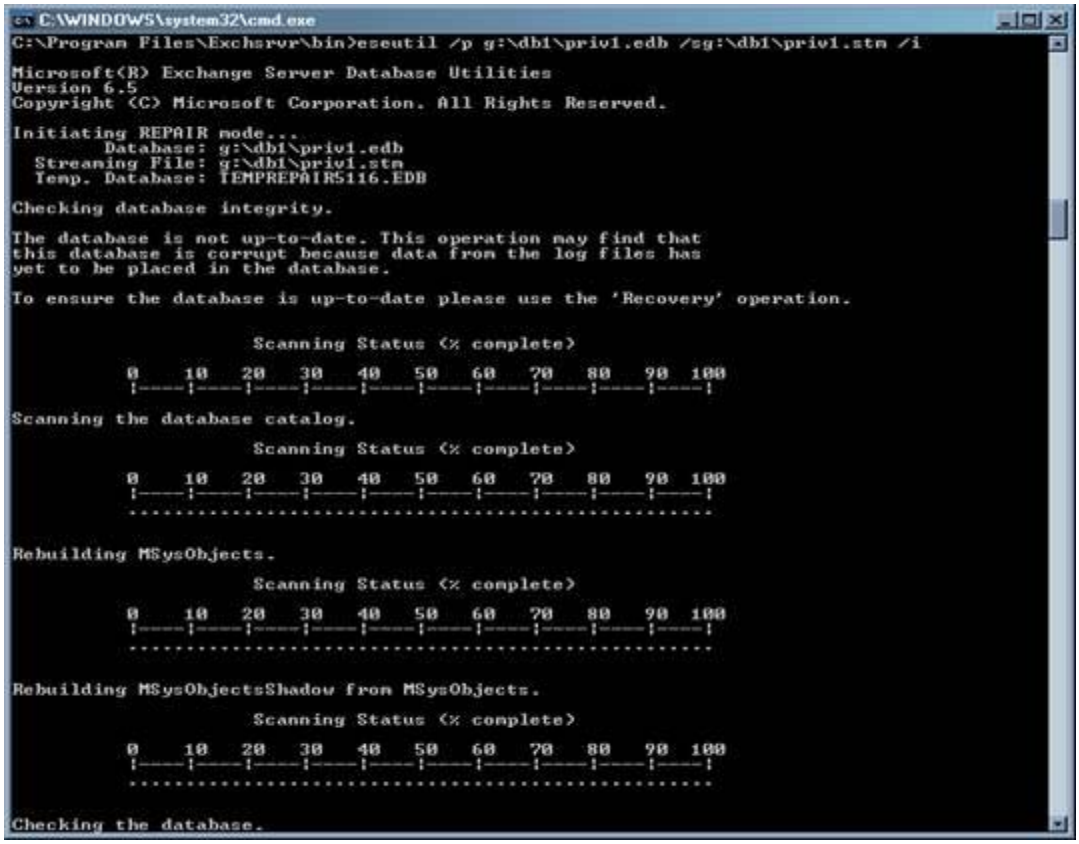


Figure 163:

Eseutil /p "G:\db1\pub1.edb" /s"G:\db1\pub1.stm" /i

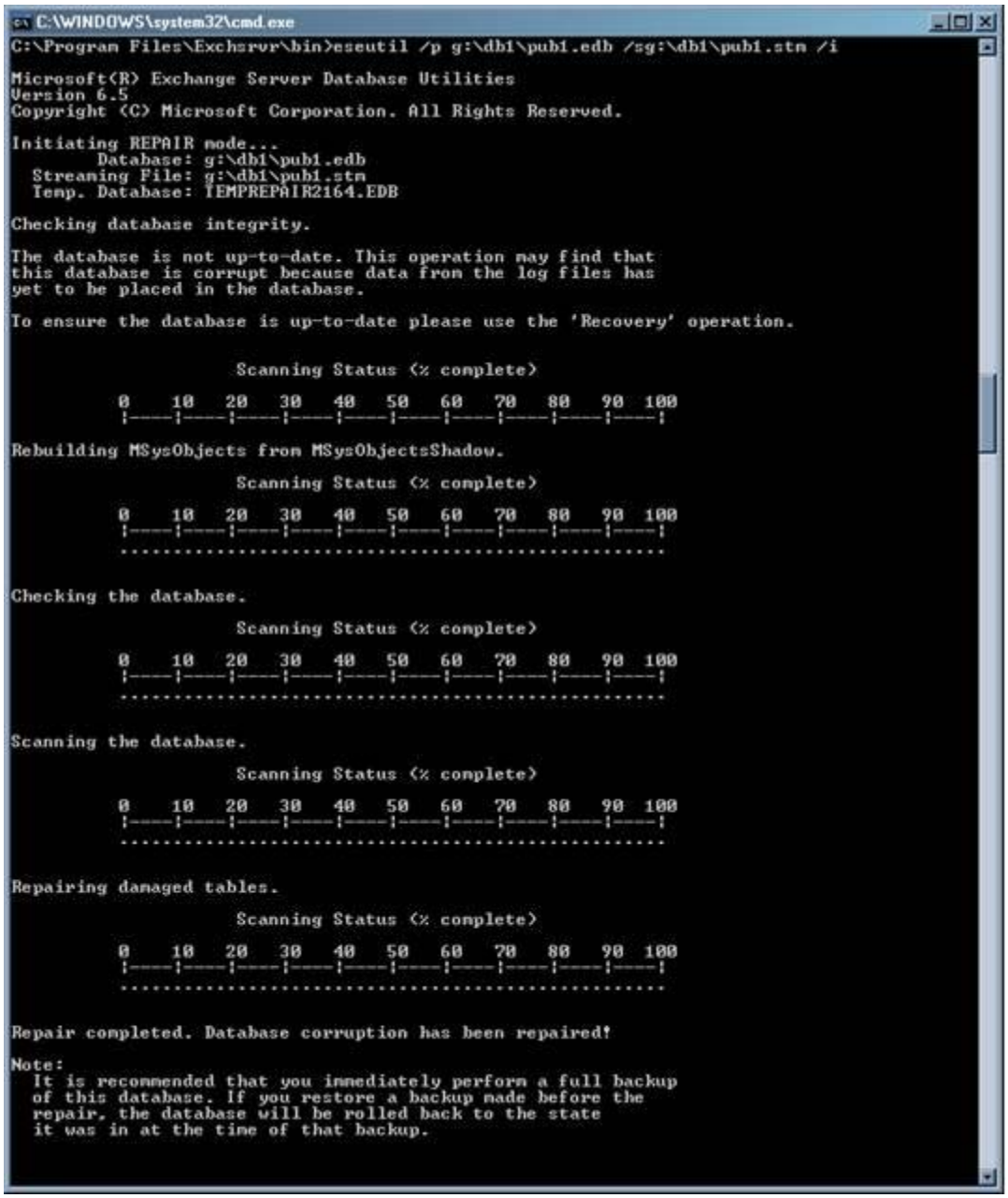


Figure 164:

cd "C:\Program Files\InMage Systems"
exfailover –failover -autorefine -cs -s<*source_server*> -t<*target_server*>

net start MSExchangeIS

- Unmount all the private and public mailstores from Exchange System Manager
- Run isinteg to fix all the databases one at a time where **<ServerName>** is the dns name of the exchange server whose databases you wish to fix. The screenshot below shows a sample using DEMO-EXCH3 as the server name.

Isinteg –fix –s DEMO-EXCH3 -test alltests

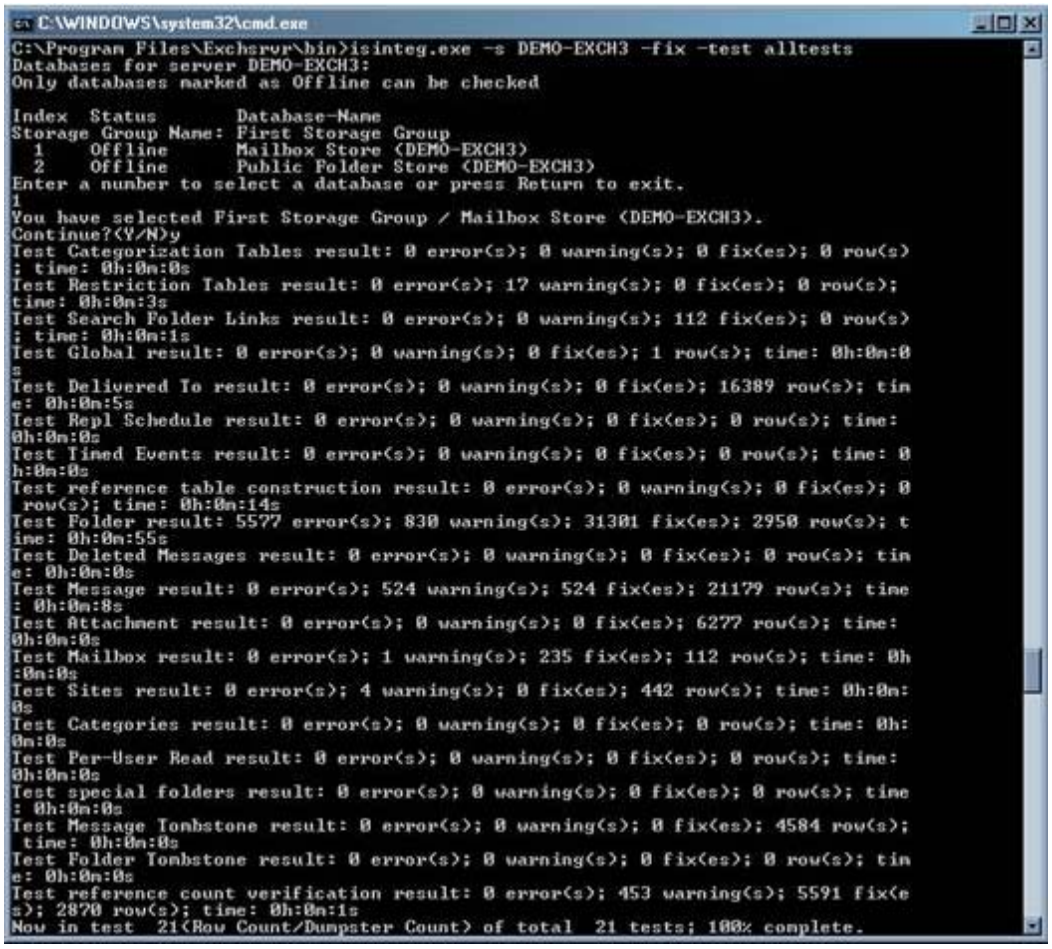


Figure 165:

- Mount all the private and public mailboxes and verify the emails by logging into the exchange user's mailboxes.

27 Known issues

1. Failover is not supported for the following scenarios
- Exchange servers in different administrative groups
- Exchange servers across domains.
- 1-N failover is not supported.
- When replication is set without considering drive mapping for example when an exchange replication is set from d:\ of production server to e:\ of DR server.
- Failover is not supported while using Junctions
- Individual storage group failover is not supported.

2. Application.exe, dns.exe does not support IPV6.

3. When there is more than one network card on the DR server during failover, the expected IP address may not be assigned to the production server at the DNS server.

4. If the production server is set to register the its IP address in the DNS on a reboot, all clients will be pointed to it rather than the DR server even after a failover, provided the production server reboots after a failover.

To resolve this, either uncheck the "**Register this connection's addresses in DNS**" check box for all NICS
OR
Add the "**DisableDynamicUpdate**" of type DWORD to the Registry key "**HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\ Tcpip\Parameters**" with value set to 1. This key disables DNS update registration for all adaptors on that computer.

5. During Exchange 2000 failover/failback while stopping/starting the Exchange services, you may observe the message "**Error: [1060] the specified service does not exist as an installed service** "which may be safely ignored.

6. For Exchange 2003/2007 Cluster, Exchange consistency validation is supported when active node name is supplied as source name in the command. When passive node is mentioned as source then the resulting script "exchangeXXXX_consistency_validation.bat" will be empty.

7. When the DR server has a storage group name different from the storage groups at production server then that will not be deleted during failover. After failover that storage group should be deleted manually.

8. Individual storage group failover is supported only for storage groups that host both the private and public folder stores and all private mailbox stores in this storage group must reference the public folder store in the same storage group. The current limitation w.r.t to both Exchange 2003 and Exchange 2007 is as follows:

- Failover is not supported for individual storage groups if a mailbox store references a public folder store that is external to the same storage group:

For example, consider the following Exchange Configuration:

Storage Group 1
  Mailbox Store 1 [references Public Folder Store 1]
  Public Folder Store 1
Storage Group 2
  Mailbox Store 2 [references Public Folder Store 1]
Storage Group 3
  Mailbox Store 3 [DOES not reference any public folder store]

- Failover of Storage Group 1 and Storage Group 3 is supported, however, failover of Storage Group 2 is not supported as it references the public folder database from Storage Group 1.

9. When Exchange system volume (where Exchange is installed) is replicated, the Exchange validation template is not supported because the eseutil.exe utility resides in the Exchange system path on the Exchange system volume which is locked as part of the VX replication.

10. During failover from cluster to stand alone machine, if failover halts at the production server after off lining the cluster resources, you will need to bring the resources online manually. This is applicable for all the cluster resources of Exchange.

11. When same computer name is available in parent/child domain environment, add/delete of SPN entries will happen from both the computer name if failover is for parent computer. Executing the WinOp.exe or Application.exe from any of the two domains will change the SPN entries of both the computers.

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