



## **Protecting Citrix XenServer Using Hitachi Dynamic Replicator - Scout**

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## 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

## 1 How this solution works

This document contains two major parts; the first part explains the LV based solution, where individual volumes are backed up to the target Citrix XenServer. The second part explains backing up whole disks to the target Citrix XenServer.

In both parts, the source Citrix XenServer is prepared before being backed up to the target Citrix XenServer through a VX replication, while the target virtual machines are powered down. Consistency markers are issued through the virtual machines which go through the source Citrix XenServer to reach the target Citrix XenServer.

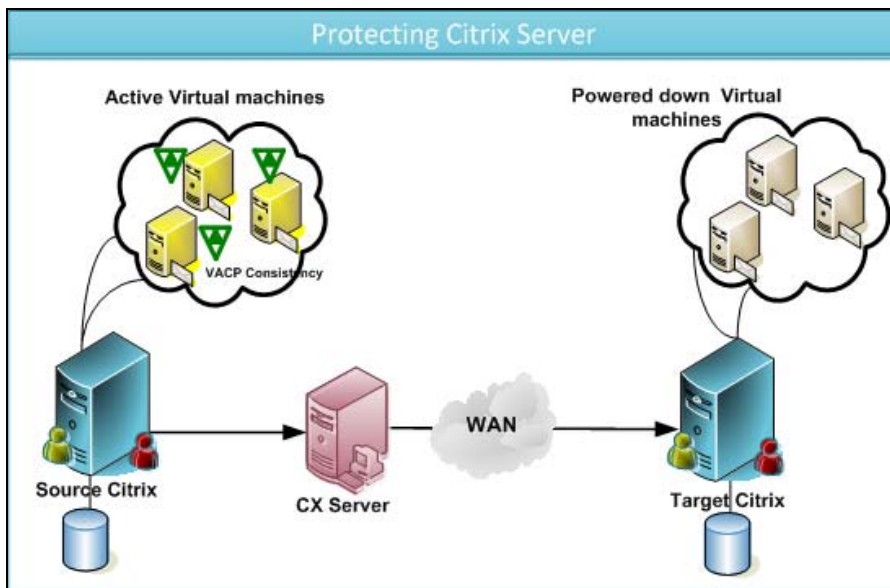


Figure 1

Recovering the VMs on Citrix XenServer may be performed in two ways; the first is to rollback the VMs' virtual disks at the target Citrix XenServer to a consistent point and start using the target virtual machines. The second approach is to take a snapshot of the virtual disks of the VMs and boot the virtual machines over the snapshot volume.

Refer to the check list in the next section before deploying the solution.

## 2 Check list

- Ensure VX agents are installed on both the Citrix XenServers
- Install CX server within the same LAN as of the source Citrix XenServer
- Point all VX agents to the same CX server and assign appropriate licenses
- Ensure that “**/etc/hosts**” on the Citrix XenServer contains the Citrix XenServer’s IP address and host name. This step is applicable for both source and target Citrix XenServers.
- Disable the firewall on both source and target Citrix XenServers through “**system-config-securitylevel-tui**” interface.
- Target Citrix XenServer should have all the networks existing at source and being used by the VMs on the source Citrix XenServers.
- Edit the file “**/etc/sysconfig/xapi**” to set the base memory which is the minimum possible allocated to dom0 by setting the value of XAPI\_DOM0\_MEM\_BASE. This requires a reboot for the new setting to take effect. For example, XAPI\_DOM0\_MEM\_BASE= “752”



### Notes:

If not existing already, create networks at the target Citrix XenServer host with the same name\_label of the networks at source Citrix XenServer host

## **Part 1: Backing up through LV replication approach**

This part explains protecting Citrix XenServer by backing up logical volumes. The prepare section is divided into sub sections, combined together they explain identifying the volumes that are to be replicated, creating guest machine structure on the target Citrix XenServer and where to install DR-Scout. The protect section explains setting replication pairs, issuing consistency tags and monitoring replication pairs.

The failover section is branched into two, the first being a rollback approach and the second being a snapshot approach. Finally a failback is described in detail.



### 3 Introduction to solution

This solution document describes how to backup/restore a Citrix XenServer to another Citrix XenServer. The production Citrix server will be referred to as the source Citrix XenServer and the DR Citrix XenServer will be referred to as a target Citrix XenServer.

The solution is divided into three steps, i.e.

#### [Prepare](#)

This section includes installing the CX server and VX agents on both source and target Citrix XenServers. Then create the guest machines on target that correspond to the source guest machines with the same disk size.



Figure 2

#### [Protect](#)

Once the guest machines are created on the target shutdown the guest machines and proceed to set replication pair(s) from source Citrix XenServer to target Citrix XenServer. Set a consistency job to issue consistency tags on the source volume(s) at regular intervals.

#### [Recover](#)

Stop the source guest machines and rollback the target volumes either through the CX UI or through CLI. Then start the target guest machines.



#### **Caution:**

This solution is for virtual machines based on LVMs.

## 4 Prepare

### 4.1 Identify logical volumes to be replicated

**Step 1.** In this step, all the logical volumes belonging to their respective virtual machines are identified through two commands

Access the source Citrix XenServer's command prompt to issue the following command

```
"xe vm-disk-list --multiple"
```

The above command:-

- Displays the virtual machines and their corresponding VBDs and VDIs on the host
- Extracts the uuid of VDI of a VM

```
[root@IMITS137 ~]# xe vm-disk-list --multiple
Disk 0 VBD:
uuid ( RO)                : 343065d6-b678-3200-3def-c849157caee7
  vm-name-label ( RO): Red Hat Enterprise Linux 5.1 x64 (1)
  userdevice ( RW): 0

Disk 0 VDI:
uuid ( RO)                : 3047b517-1de0-4854-9260-6503f8b234a8
  name-label ( RW): 0
  sr-name-label ( RO): Local storage on IMITS137
  virtual-size ( RO): 8589934592

Disk 0 VBD:
uuid ( RO)                : 6c8dfc5d-fbf2-4483-7f2b-4d24f30b7f7c
  vm-name-label ( RO): Windows Server 2003 x64 (1)
  userdevice ( RW): 0
```

Figure 3



Notes:

The uuid of the virtual machine that is to be replicated

**Step 2.** Once the command is complete, proceed to issue the following command on the source Citrix XenServer's command prompt.

**"lvdisplay"**

- This displays all the available logical volumes on the host
- Identify the logical volume with the same uuid as of the virtual machine that is to be protected.

```
[root@IMITS137 ~]# lvdisplay
--- Logical volume ---
LV Name                /dev/VG_XenStorage-84a2406c-dcbb-0e0b-d402-030b98c69582/LV-4f643506-
fe82-4442-a89e-091b61fa2074
VG Name                VG_XenStorage-84a2406c-dcbb-0e0b-d402-030b98c69582
LV UUID                NetFAK-PjQ0-Eo2v-R01L-nLQG-LL8j-yYuMo4
LV Write Access        read/write
LV Status              NOT available
LV Size                752.00 MB
Current LE             188
Segments               1
Allocation             inherit
Read ahead sectors     0
--- Logical volume ---
LV Name                /dev/VG_XenStorage-84a2406c-dcbb-0e0b-d402-030b98c69582/LV-3047b517-
1de0-4854-9260-6503f8b234a8
VG Name                VG_XenStorage-84a2406c-dcbb-0e0b-d402-030b98c69582
LV UUID                2qxFOF-zdN3-f9o5-BKmz-37FE-yubp-nY9LHn
LV Write Access        read/write
LV Status              available
# open                 1
LV Size                8.00 GB
Current LE             2048
Segments               1
Allocation             inherit
Read ahead sectors     0
Block device           252:0
```

**Figure 4**

After the above two command, you will be able to map virtual machines with their respective logical volumes.

## 4.2 Re-create guest machines on the target

Open the XenCenter interface, then create the guest machines on the target citrix XenServer with the same configuration, operating system and disk size. Creating Windows and Linux virtual machines are slightly different, however both procedures are described below.

### Creating Window virtual machine

**Step 1.** Open the XenCenter then select the target Citrix XenServer and click on “New VM”. This will create a new virtual machine on the target Citrix XenServer.



Figure 5

**Step 2.** The wizard follows, select the same template as of the production guest, and then click on “Next”.

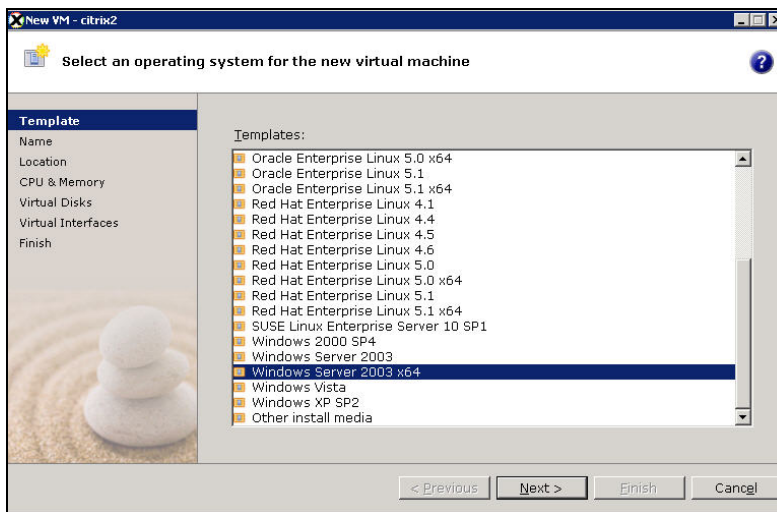
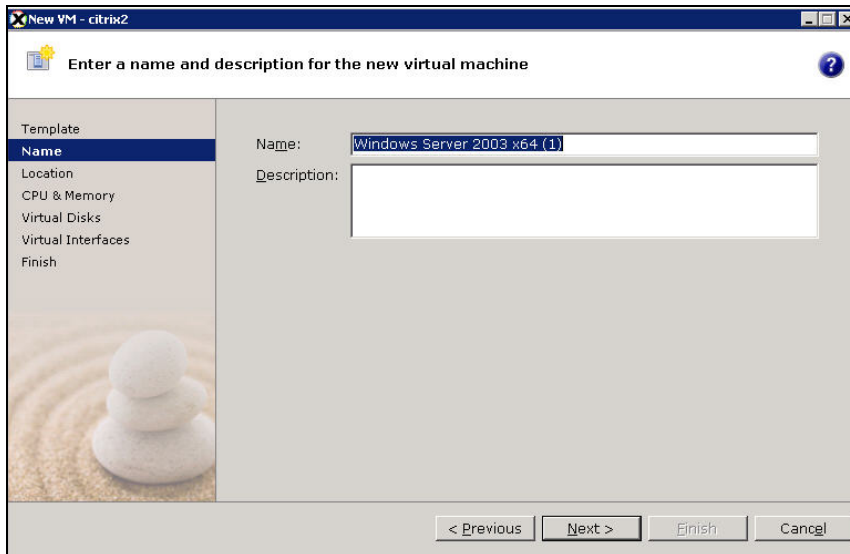


Figure 6

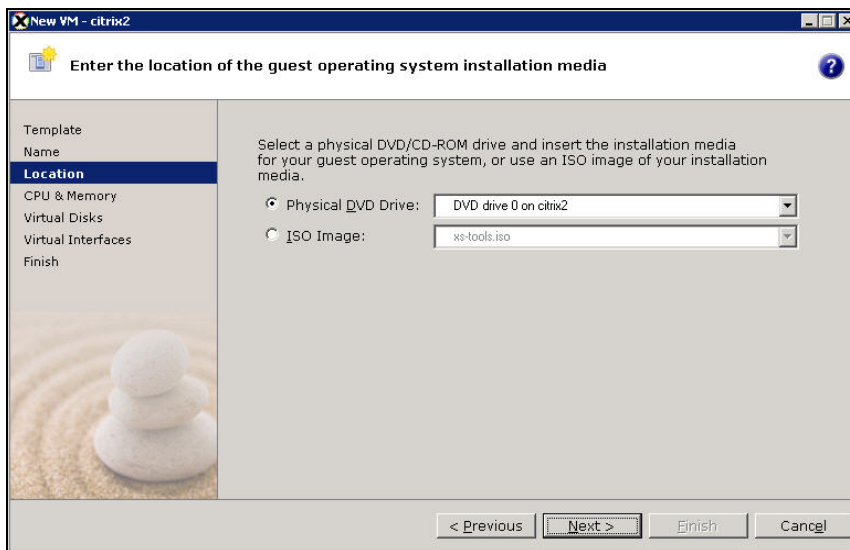
**Step 3.** Enter the “Name” and “Description” of the guest machine and then click on “Next” to continue.



The screenshot shows the 'New VM - citrix2' wizard window. The title bar reads 'New VM - citrix2'. The main title is 'Enter a name and description for the new virtual machine'. On the left, a sidebar lists steps: Template, Name (selected), Location, CPU & Memory, Virtual Disks, Virtual Interfaces, and Finish. Below the sidebar is a decorative image of stacked stones. The main area has two input fields: 'Name:' with the text 'Windows Server 2003 x64 (1)' and 'Description:' with an empty text box. At the bottom, there are four buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'.

**Figure 7**

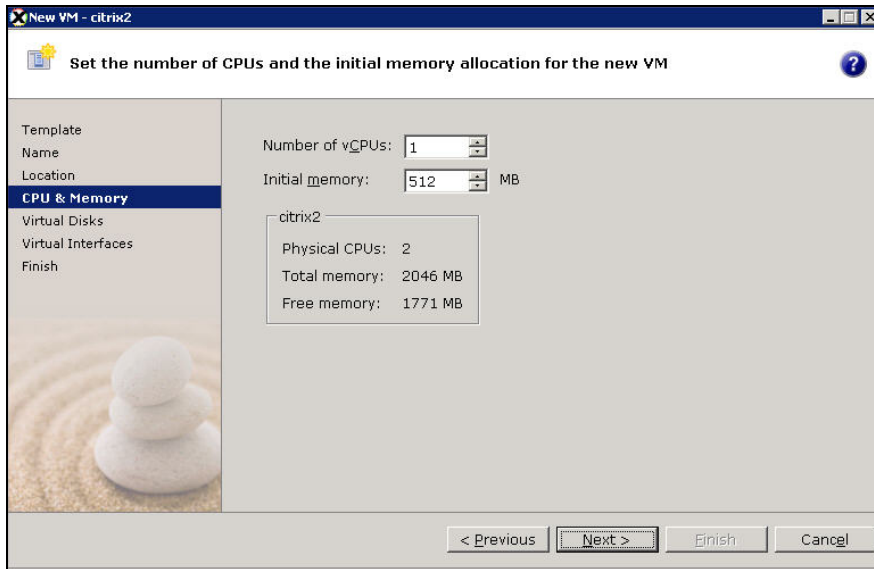
**Step 4.** You may choose to load a bootable CD into the CD drive or enter the path of a bootable ISO image. Then click on “Next”.



The screenshot shows the 'New VM - citrix2' wizard window. The title bar reads 'New VM - citrix2'. The main title is 'Enter the location of the guest operating system installation media'. On the left, a sidebar lists steps: Template, Name, Location (selected), CPU & Memory, Virtual Disks, Virtual Interfaces, and Finish. Below the sidebar is a decorative image of stacked stones. The main area has a text box with the instruction: 'Select a physical DVD/CD-ROM drive and insert the installation media for your guest operating system, or use an ISO image of your installation media.' Below this are two radio buttons: 'Physical DVD Drive:' and 'ISO Image:'. The 'Physical DVD Drive:' option is selected, and its dropdown menu shows 'DVD drive 0 on citrix2'. The 'ISO Image:' option is unselected, and its dropdown menu shows 'xs-tools.iso'. At the bottom, there are four buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'.

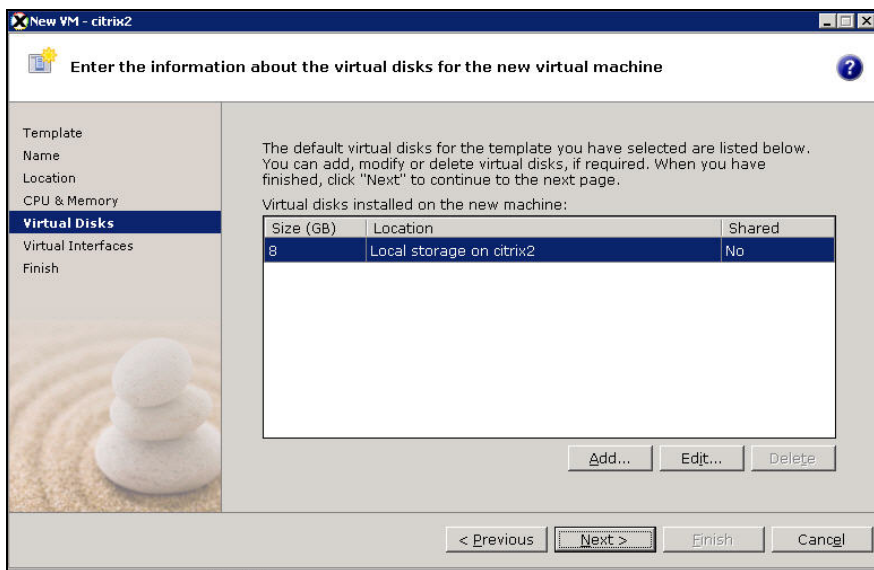
**Figure 8**

**Step 5.** Enter the number of virtual CPUs and physical memory and then click on “Next”.



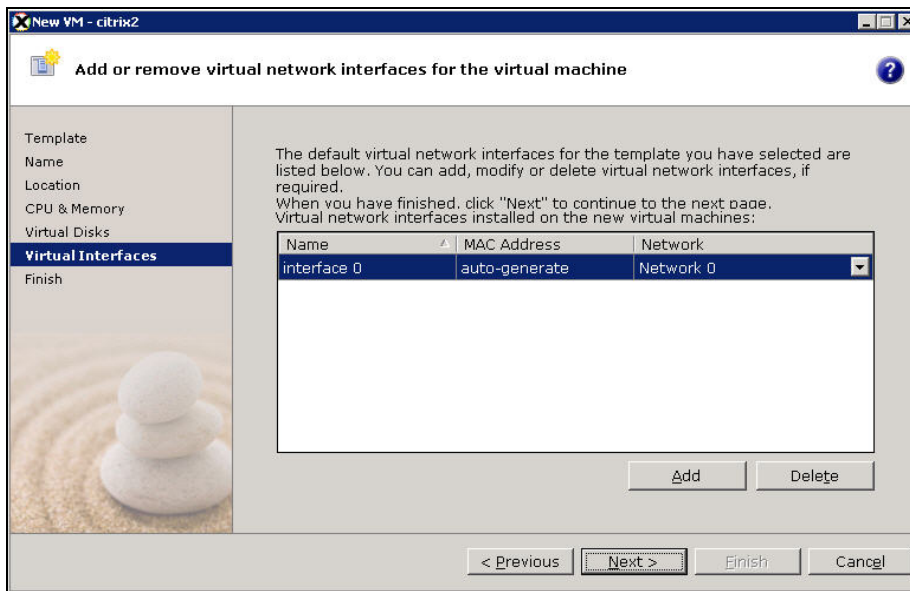
**Figure 9**

**Step 6.** The next screen opens up, ensure that you add a disk of similar or larger size as of the source guest machine, then click on “Next”



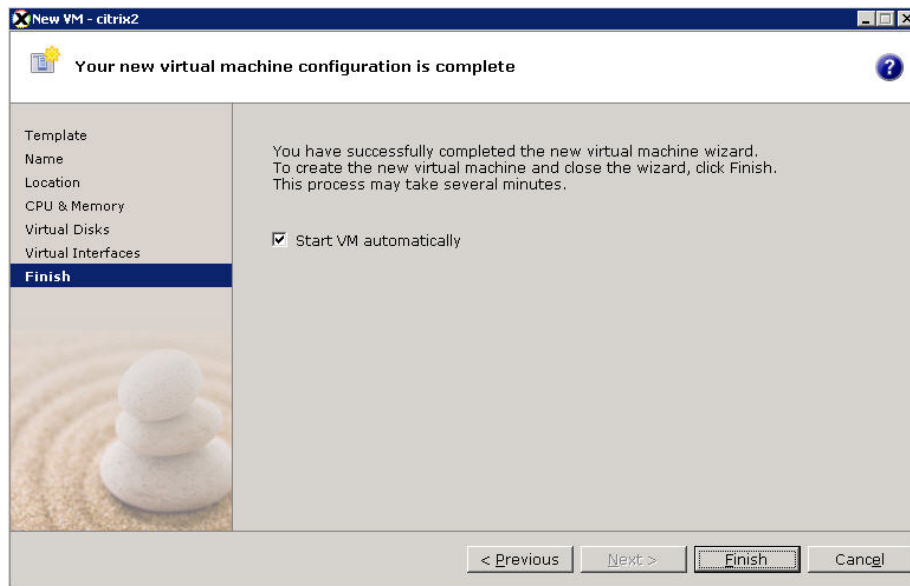
**Figure 10**

**Step 7.** Through this screen you can add a desired number of virtual NICs. Create the virtual interfaces such that the configuration reflects that of the source VM. Click on “Next” to proceed



**Figure 11**

**Step 8.** Click on “Finish” and the virtual machine starts.



**Figure 12**

## Creating Linux virtual machine

**Step 1.** A new “New Storage” is created to load a boot image. Select the target Citrix Xenserver then click on “New storage”.

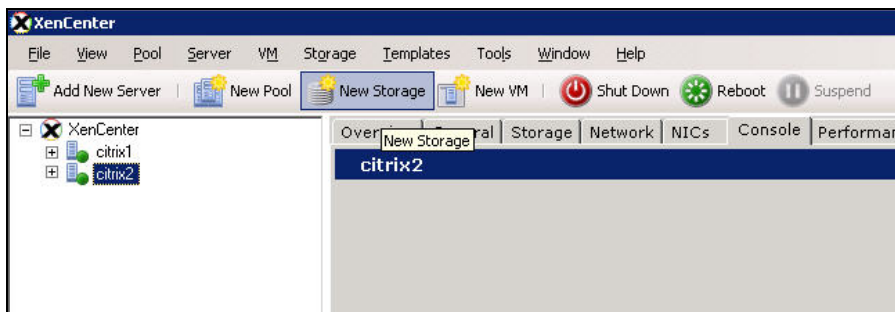


Figure 13

**Step 2.** You may choose any of the desired option then click on “Next”. (For this example however, we select windows file sharing)

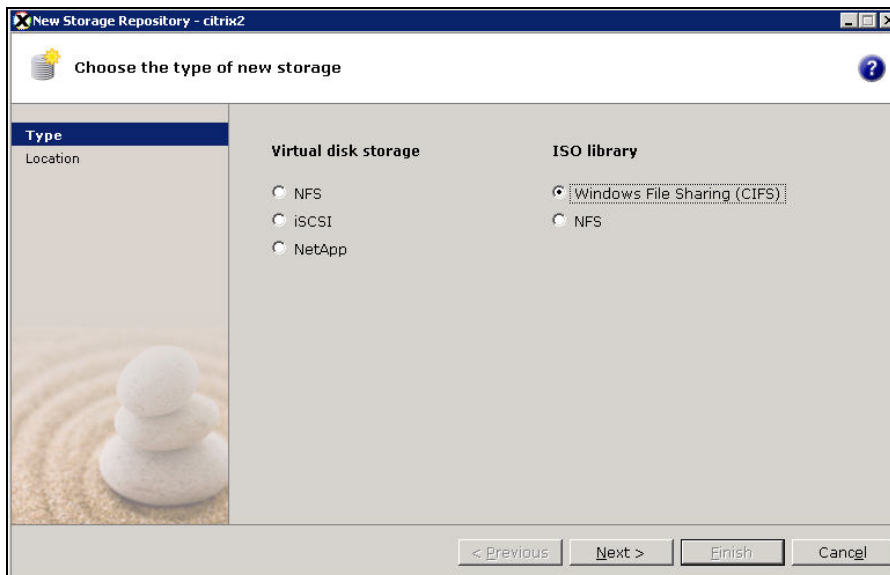
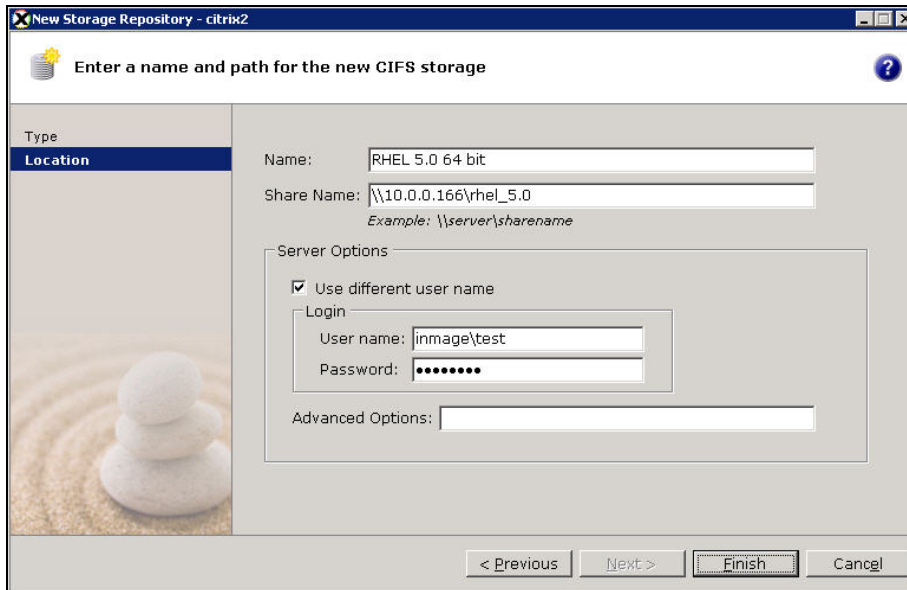


Figure 14

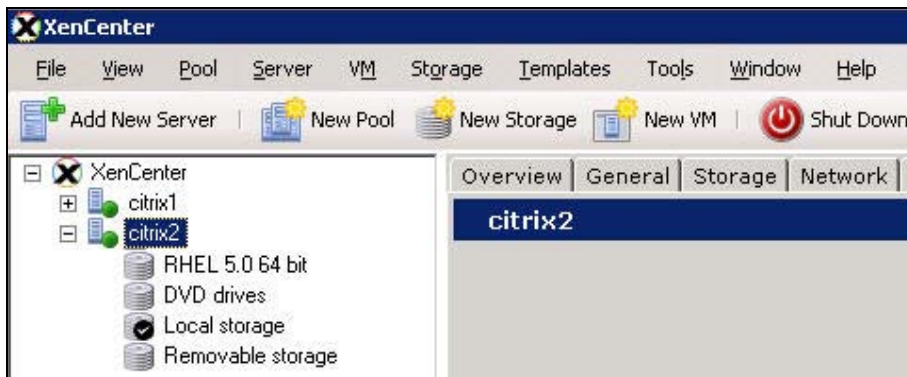


**Step 3.** Enter the “Name” and “Path” and then enter the full user name and password to access the entered path. Click on “Finish” to complete adding a new storage.



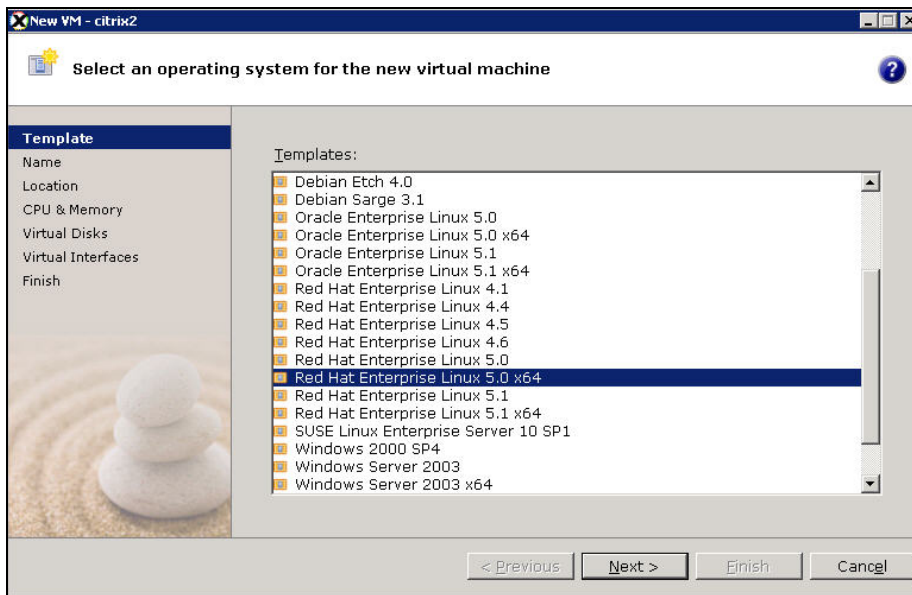
**Figure 15**

**Step 4.** The new storage now appears under the target Citrix XenServer. Click on “New VM” to create a new Linux guest machine on the target Citrix XenServer.



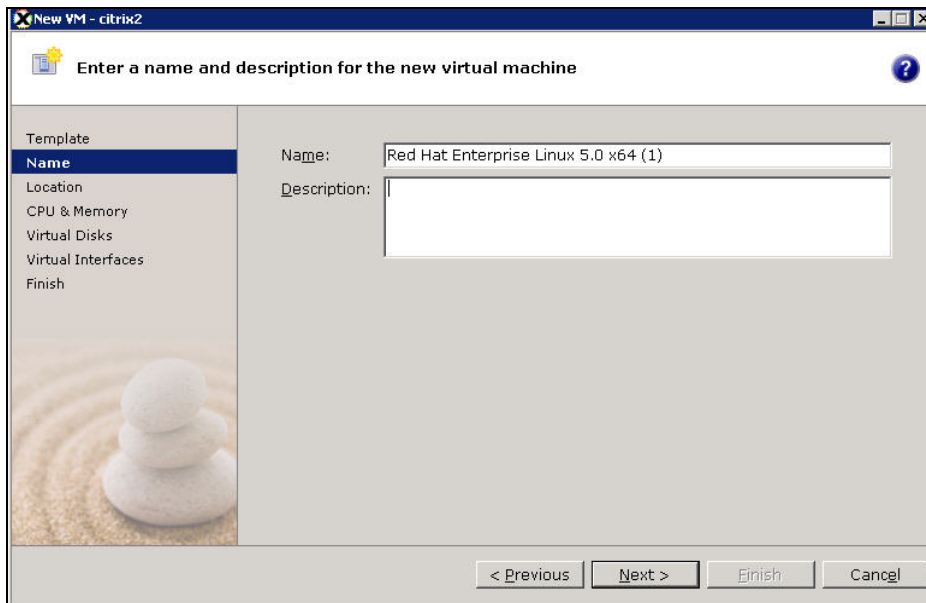
**Figure 16**

**Step 5.** The template screen opens up, select the desired Linux template, and click on “Next” .  
For this example we select a 64 bit RHEL 5 operating system. Ensure that you select the same template as of the production guest machine.



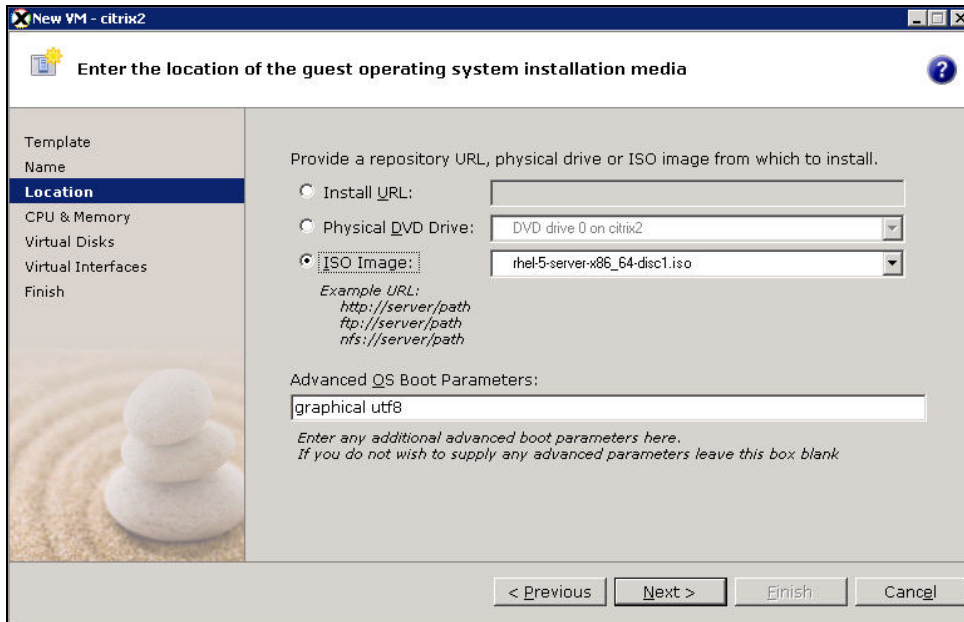
**Figure 17**

**Step 6.** Enter the name of the new virtual machine and description and then click on “Next”.



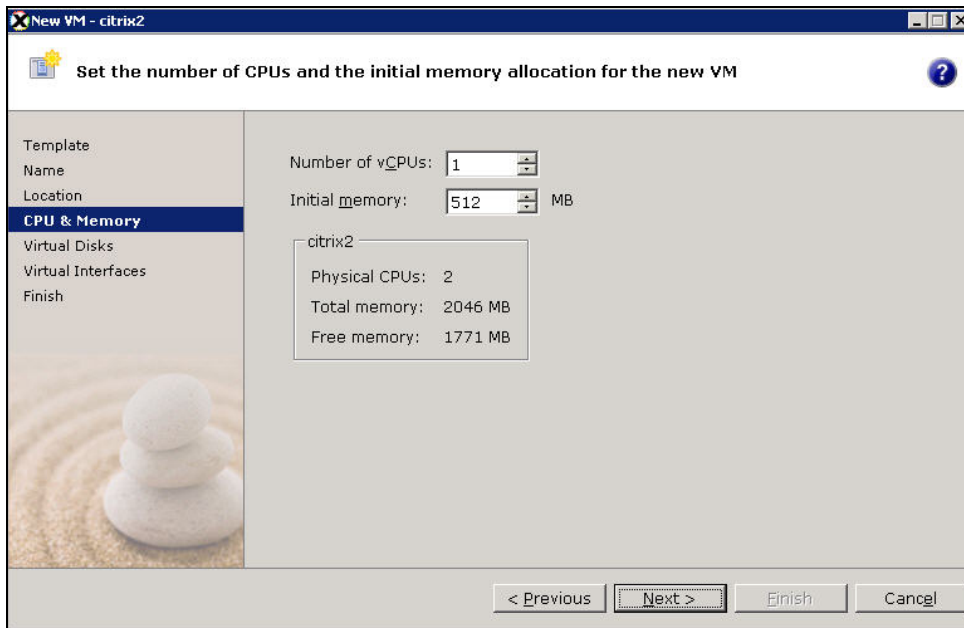
**Figure 18**

**Step 7.** Select the desired option ( a URL, CD drive or ISO image path). Entering boot parameters is optional. Click on “Next” to proceed.



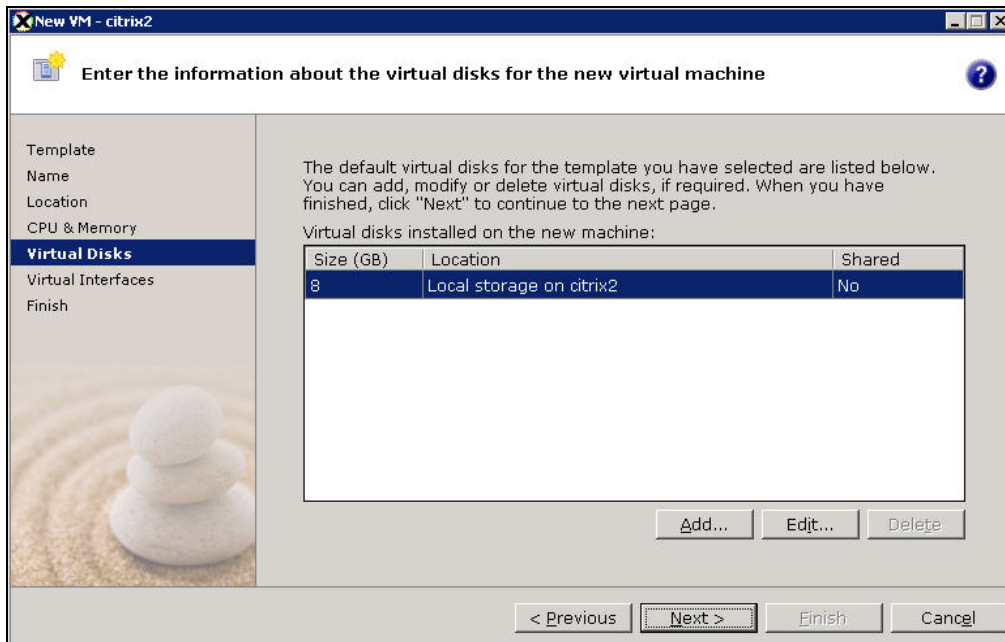
**Figure 19**

**Step 8.** Enter the number of virtual CPUs and physical memory and then click on “Next”



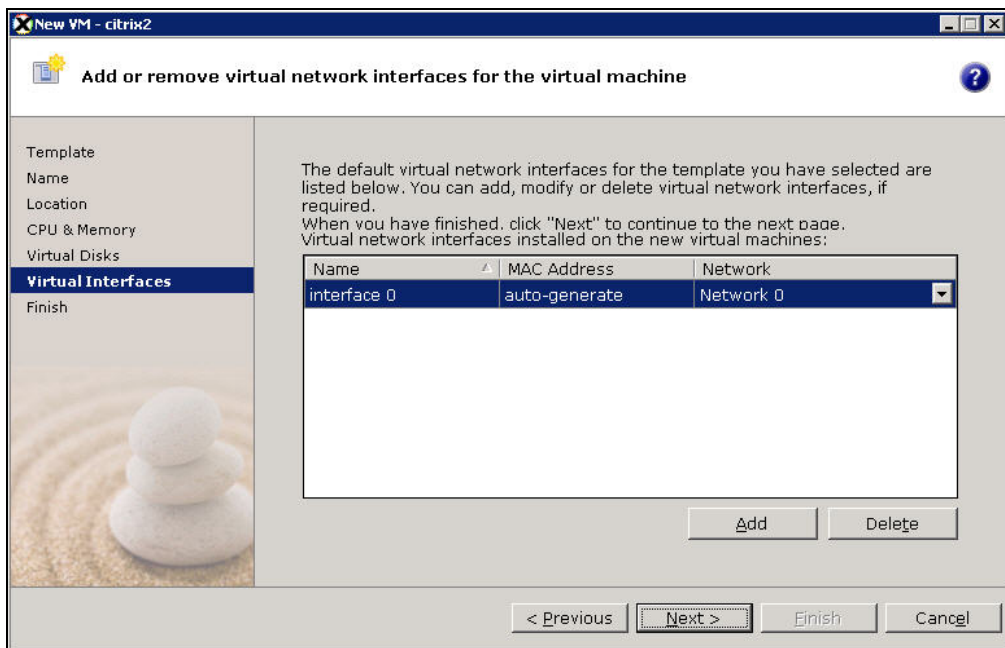
**Figure 20**

**Step 9.** The next screen opens up, ensure that you add a disk of the same size as of the source guest machine and then click on “Next”.



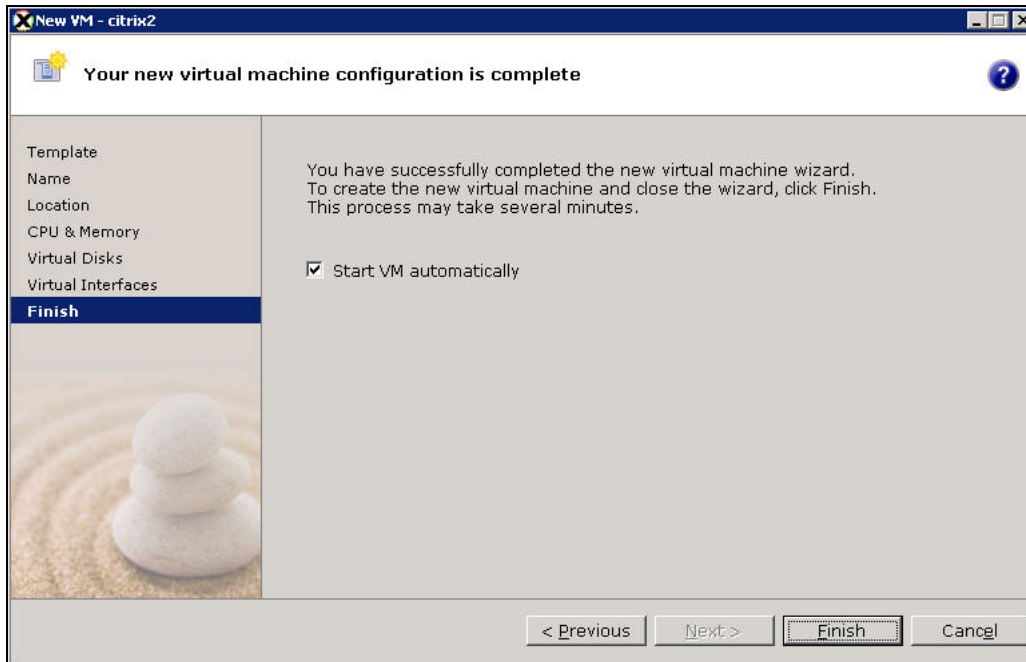
**Figure 21**

**Step 10.** Through this screen you can add a desired number of virtual NICs. Create the virtual interfaces such that the configuration reflects that of the source VM. Click on “Next” to proceed.



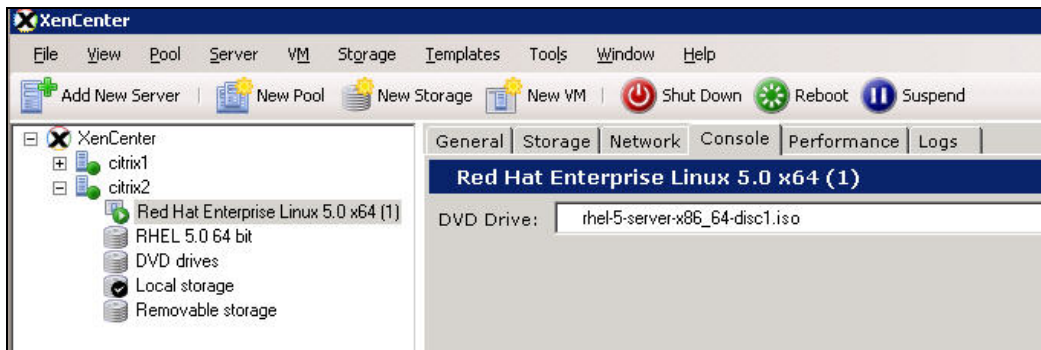
**Figure 22**

**Step 11.** Click on “**Finish**” to start the virtual machine.



**Figure 23**

**Step 12.** The machine boots up as shown in the picture below



**Figure 24**

### 4.3 Install DR-Scout

Please refer to the installation guide for installing and configuring CX server and VX agents. The VX agents are to be installed on the source and target Citrix XenServers.

## 5 Protect

### 5.1 Replicate source virtual machines

Setting a volume replication is performed in four steps as shown in the picture below.

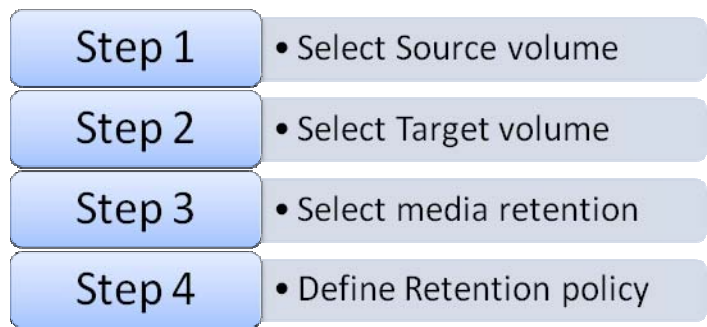


Figure 25

**Step 1.** Open the CX UI and click on “**Volume Protection**”, then expand the source Citrix XenServer to select the source volume corresponding to the source guest machine that is to be protected and click on “**Start Replication**”

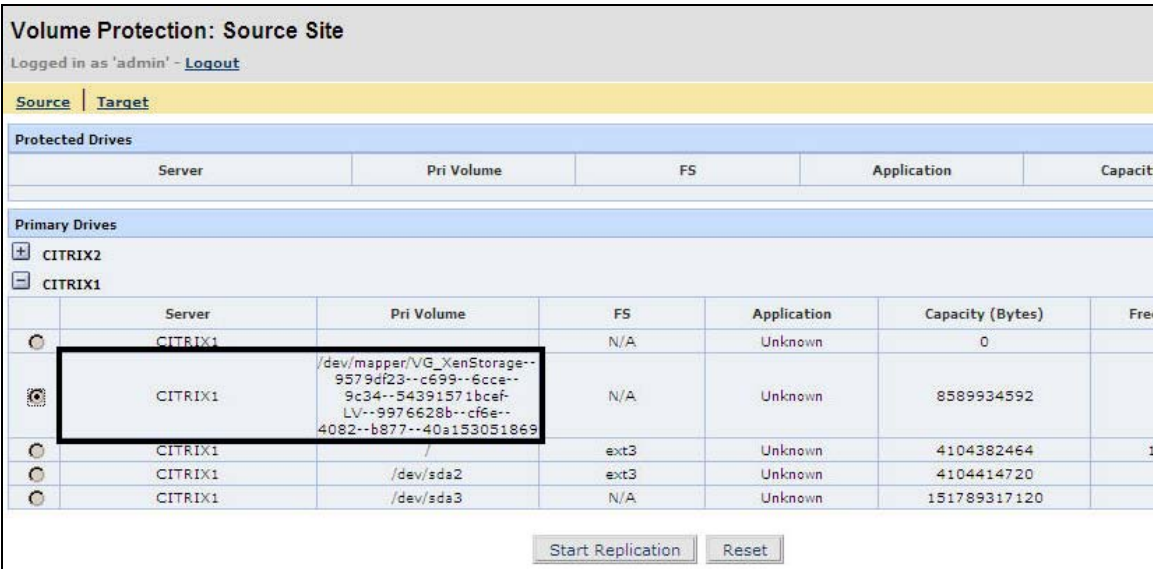


Figure 26

**Step 2.** The next screen opens up. Expand the target Citrix XenServer to select the respective target volume. Then scroll down to set the replication options.

Host: CITRIX1				
Drive: /dev/mapper/VG_XenStorage--9579df23--c699--6cce--9c34--54391571bcef-LV--9				
Capacity: 8589934592				
Select a target WAN volume				
	WAN Server	Volume	Capacity (Bytes)	Free
[-] CITRIX2				
<input checked="" type="radio"/>	CITRIX2	/dev/mapper/VG_XenStorage--04f08f2--d086--3264--bd62--4c16ed9148c9-LV--2ec05fb7--a142--455c--baac--8fda97ef76dd	8589934592	
<input type="radio"/>	CITRIX2	/dev/mapper/VG_XenStorage--b36a186f--0046--8c95--9b19--c91d0f460756-LV--34bc8ceb--56d9--4c71--acac--ab7017846440	8589934592	
<input type="radio"/>	CITRIX2	/mnt	4104414720	
<input type="radio"/>	CITRIX2	/dev/sda3	151789317120	

Figure 27

**Step 3.** All the process servers pointed to the CX server are listed here. You may choose a desired process server which will handle all the offload activities specific to this replication pairs. For better scalability you may point more process servers to the CX server. Select the process server and scroll down to set the “**Replication Options**”

Process Server	
<div> <div>Select Process Server</div> <div>ITGTR5U2-64.inimage.in(10.0.164.73)</div> <div>w2k3-32PPS(10.0.227.227)</div> <div>SR5U2-64.inimage.in(10.0.248.73)</div> </div>	<div>Number of Pair Configured</div> <div>2</div>

Figure 28

**Step 4.** Enable the Media Retention and click on “**Submit**” and the rest are optional.

Replication Options	
<input type="checkbox"/>	Secure transport from Source to InMage CX
<input type="checkbox"/>	Secure transport from InMage CX to destination
Sync options:	Fast
Use compression:	CX Based Compression (Overrides existing 1-N replication pairs)
Add to volume consistency group:	New Volume Group
Media Retention	
<input checked="" type="checkbox"/>	Enable Media Retention option
Automatic Resync Options	
<input type="checkbox"/>	Start between hours 18 : 00 and 6 : 00 after waiting 30 minutes. (All times are local to CX)
<input type="button" value="Submit"/> <input type="button" value="Cancel"/> <input type="button" value="Reset"/>	

**Figure 29**

**Step 5.** The next screen opens up, choose the desired retention policy, and click on “**Submit**” to start the replication pair

Volume Protection: Retention Options			
Logged in as 'admin' - <a href="#">Logout</a>			
Pair Details			
Server	Pri Volume	Remote Server	Volume
CITRIX1	/dev/mapper/VG_XenStorage--9579df23--c699--6cce--9c34--54391571bceh-LV--9976628b--cfe8--4082--b877--40a153051869	CITRIX2	/dev/mapper/VG_XenStorage--04f08f2--d086--3264--bd62--4c16ed9148c9-LV--2ec05fb7--a142--455c--baac--8fda97ef76dd
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	<input checked="" type="radio"/> Purge older retention logs <input type="radio"/> Pause differentials		
Log data directory	/mnt/logs (Eg:- K:\log_data) ./,./mnt are drives suggested for storing rollback log files.		
Configure Threshold for Alerts			
Alert when disk space utilization reaches	80 %		
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>			

**Figure 30**





#### Notes:

Repeat above steps to protect any additional guest machines  
Setting the replication pair is similar for windows and Linux platforms.

## 5.2 Shutdown target virtual machines

Before setting the replication pairs shutdown target virtual machines.

**Step 1.** Shutdown the Windows target virtual machine(s) as shown below.



Figure 31

**Step 2.** Similarly, shutdown the Linux target virtual machine(s)



Figure 32

After shutting down the VM ensure that all the protected logical volumes (corresponding to the virtual disks of the VM that was shutdown) are available or not. If any protected logical volume is not available, run “**lvchange -ay <Logical\_Volume>**” to make the logical volume available.

### 5.3 Monitor replication pair

In this Click on “Protection Status” to monitor the replication status. Observe that there are two replication pairs, one for windows, and the other for Linux virtual machines.

Protection Status

Logged in as 'admin' - [Logout](#)

Server Time: Sep-17-2008 17:55:26

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
CITRIX1->CITRIX2	/dev/mapper/VG_XenStorage-- 9579d23--c699--6cce-- 9c34--54391571bcef-LV--9976628b--cf6e-- 4082-b877--40a153051869->/dev/mapper /VG_XenStorage-- 04f08f2--d086--3264-bd62--4c16ed9148c9- LV--2ec05fb7--a142--455c--baac-- 8fda97ef76dd	Volume /dev/mapper/VG_XenStorage-- 04f08f2--d086--3264-bd62--4c16ed9148c9- LV--2ec05fb7--a142--455c--baac-- 8fda97ef76dd	0	0	0	N/A	0.7 minutes	Differential Sync	NO	

Figure 33



#### Notes:

You may choose to set email alerts or traps. Please refer to the Admin guide.pdf for detailed description.

## 5.4 Consistency tags

**Step 1.** Once the replication pair reaches “**Differential Sync**”, proceed to issue consistency tags on the source volume. Consistency tags are issued on the source virtual machine, Access the CX UI through the source virtual machine to download the vacp client. Download the appropriate vacp client through “**System-> Agent installers**”.



Figure 34

- vacp32-suse9 is used for guest machine with 32 bit platforms of SUSE 9, SLES 9 SP2, SLES 9 SP3.
- Vacp x64.exe is used for 64 bit windows platforms
- Vacp IA64.exe is used for 64 bit windows on Itanium platform.
- Vacp64 is used for the guest machines with any 64 bit platform
- Vacp.exe is used for 32 bit windows platforms
- Vacp32 is used for 32 bit Linux platforms

For a Linux virtual machine use the following command

```
./vacp -remote -v <volume1>,<volume2>,... -t <name of the consistency tag> -  
serverdevice <corresponding volume on the source Citrix XenServer >,... -serverip  
<Source Citrix XenServer's IP address> [-serverport 20003]
```

-serverport 20003 is an optional switch

```
[root@citrixguest1 ~]# ./vacp -v /dev/mapper/VolGroup00-LogVol100 -remote -server  
device /dev/mapper/VG_XenStorage--04f08ff2--d086--3264--bd62--4c16ed9148c9-LV--2  
ec05fb7--a142--455c--baac--8fda97ef76dd -t "my tag" -serverip 10.0.1.3  
Caught an exception with Local Configurator Settings  
Generating tag names ...  
Tag: FileSystem48d0fbd5  
Tag: my tag  
  
Sending Following Tag Request ...  
Flags = 3  
Num. Volumes = 1  
Volume: 1 Name: /dev/mapper/VG_XenStorage--04f08ff2--d086--3264--bd62--4c16ed91  
48c9-LV--2ec05fb7--a142--455c--baac--8fda97ef76dd Length:112  
Num. Tags = 2  
Tag: 1 Length:11  
Tag: 2 Length:23  
  
Starting device I/O suspension...  
ENTERED: ConsToVopServer
```

Figure 35

## 6 Failover

### 6.1 Differences between rollback and snapshot

The target virtual machines may be recovered either by rolling back the target volumes or by taking a snapshot of the target volumes.

**Table 1: Differences between rollback and snapshot**

	Snapshot	Rollback
Replication	Intact	Breaks replication pair
Storage	Requires an additional volume with equal or larger capacity on the DR server	No additional storage required
Consistency	Both tag based and time based	Both tag based and time based

A snapshot is not disruptive to the replication pair where as a rollback breaks the replication pair.

## 6.2 Rollback approach

Target volume can be rolled back in time based or an event back in time based on a vacp tag issued on the source volume or based on time. A roll back can be performed through CX UI and command line interface of the DR Server. This example describes to perform an event based roll back.

**Step 1.** On the CX UI, click on **“Recovery”** then select the replication pair and click on **“Rollback”**. A confirmation message appears, click on **“Ok”**

**Volume Recovery : Recovery Snapshots**  
Logged in as 'admin' - [Logout](#)

**Recovery Snapshots** | [Scheduled Snapshots](#)

Replication Pair Details					
	Server	Pri Volume	Remote Server	Volume	Replication Pool
	CITRIX1	/dev/mapper/VG_XenStorage--9579df23--c699--6cce--9c34--54391571bcef-LV--9976628b--cf6e--4082--b877--40a153051869	CITRIX2	/dev/mapper/VG_XenStorage--04f08ff2--d086--3264--bd62--4c16ed9148c9-LV--2ec05fb7--a142--455c--baac--8fda97ef76dd	8

[Recover](#) [Rollback](#) [Reset](#)

Figure 36

**Step 2.** The next screen opens up, to perform an event based rollback, select the option **“Using Application consistency & Event based”**

**Volume Recovery: Recovery SnapShot Options**  
Logged in as 'admin' - [Logout](#)

Pair Details				
Server	Primary Volume	Remote Server	Target Volume	Replication Pool
CITRIX1	/dev/mapper/VG_XenStorage--9579df23--c699--6cce--9c34--54391571bcef-LV--9976628b--cf6e--4082--b877--40a153051869	CITRIX2	/dev/mapper/VG_XenStorage--04f08ff2--d086--3264--bd62--4c16ed9148c9-LV--2ec05fb7--a142--455c--baac--8fda97ef76dd	8

**Recovery Options**

Logs Available      From 2008/9/17 12:25:5:961 (GMT)      To 2008/9/17 13:31:45:281 (GMT)

Recovery Based On

☐ Using Time      ☒ Using Application consistency & Event based

Figure 37

This changes the interface below to a “**search result**” and display a list of available consistency tags to which a roll back may be performed. Select the desired tag and click on “**Save**”








Search Result				
	<u>Accuracy</u>	<u>Timestamp</u>	<u>Application</u>	<u>Tag Name</u>
		2008/9/17 12:59:19:381	File System	FileSystem48d0ff27
		2008/9/17 12:59:19:381	User Defined	my tag
<< < 1 > >>				
Recovery Points Accuracy:  - Exact  - Approximate  - Not guaranteed				
<input type="button" value="Save"/> <input type="button" value="Cancel"/>				

Figure 38

This will roll back the target volume to a consistent point

**Step 3.** Click on “**Recovery**” to check the status of the rollback. A rollback is similar for windows replication pairs as well.






Target Drive Rollback Status								
	Host	Rollback Drive	Status	Progress	Expected Recovery Point	Actual Recovery Point	Recovery based on	Info Message
	CITRIX2	/dev/mapper/VG_XenStorage--04f08ff2--d086--3264--bd62--4c16ed9148c9-LV--2ac05fb7--a142--455c--baac--8fda97ef76dd	Complete	100%	2008/9/17 12:59:19:381	-	Tag Based Tag my tag Accuracy 	-
<input type="button" value="Release Drive"/>								
Recovery Points Accuracy:  - Exact  - Approximate  - Not guaranteed								

Figure 39

### 6.3 Bring target virtual machines online

In case of an unplanned failover shutdown the production Citrix XenServer once the rollback is complete. For planned failover shutdown the source virtual machines then reboot the target virtual machines (which should be in halted state now). The target guest machines should come up normally.

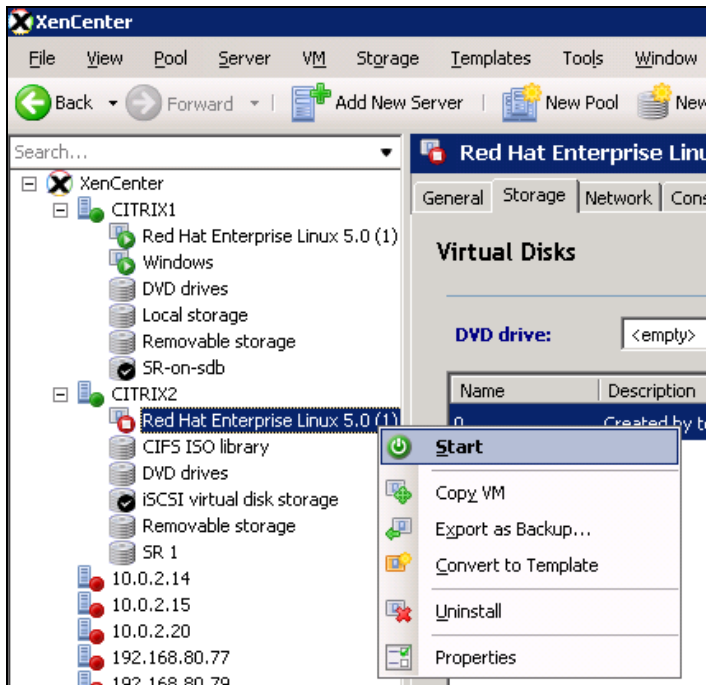


Figure 40



## 6.4 Snapshot approach

This involves four steps

- **Prepare for snapshot disk:** Create a new disk with equal capacity
- **Create snapshot:** Create a snapshot of the target volume through the CX UI
- **Swap device:** Swap the original device with the snapshot device
- **Start guest machine:** The guest machine should boot up with the snapshot disk



Figure 41

### Prepare for the snapshot

Create a virtual disk equal in size to that of the target volume. This virtual disk is used to contain the snapshot.

**xe vdi-create** name-label=<label of the virtual disk> sr-uuid=<UUID of SR where this virtual disk is being created> -type=<"system" for bootable disk or "user" for other disks> -size=<size of the disk should be equal to that of the target volume>

```
root@IMITS137:/etc
[root@IMITS137 etc]# xe vdi-create name-label="SR1_snapshot" sr-uuid=b36a186f-0046-8c95-9b19-c91d0f460756 type=system virtual-size=8589934592
34bc8ceb-56d9-4c71-acac-ab7017846440
[root@IMITS137 etc]#
```

Figure 42

Once the disk is created, bring the newly created virtual disk online through the command as shown below

**lvchange -ay** <Logical volume corresponding to the virtual disk>

```
root@IMITS137:/etc
[root@IMITS137 etc]# lvchange -ay /dev/VG_XenStorage-b36a186f-0046-8c95-9b19-c91d0f460756/LV-34bc8ceb-56d9-4c71-acac-ab7017846440
[root@IMITS137 etc]#
```

Figure 43

## Create a snapshot

**Step 1.** On the CX UI, click on **“Recovery”**, select the replication pair, and click on **“Recover”**.

**Volume Recovery : Recovery Snapshots**  
 Logged in as 'admin' - [Logout](#)

[Recovery Snapshots](#) | [Scheduled Snapshots](#)

**Replication Pair Details**

Server	Pri Volume	Remote Server	Volume	Replication Pool
CITRIX1	/dev/mapper/VG_XenStorage--9579df23--c699--6cce--9c34--54391571bcef-LV--9976628b--cf6a--4082--b877--40a153051869	CITRIX2	/dev/mapper/VG_XenStorage--04f08ff2--d086--3264--bd62--4c16ed9148c9-LV--2ec05fb7--a142--455c--baac--8fda97ef76dd	8

[Recover](#) [Rollback](#) [Reset](#)

Figure 44

**Step 2.** The next screen opens up. Select the option **“Using Application consistency & Event based”** to perform an event based recovery.

**Volume Recovery: Recovery SnapShot Options**  
 Logged in as 'admin' - [Logout](#)

**Pair Details**

Server	Primary Volume	Remote Server	Target Volume	Replication Pool
CITRIX1	/dev/mapper/VG_XenStorage--9579df23--c699--6cce--9c34--54391571bcef-LV--9976628b--cf6a--4082--b877--40a153051869	CITRIX2	/dev/mapper/VG_XenStorage--04f08ff2--d086--3264--bd62--4c16ed9148c9-LV--2ec05fb7--a142--455c--baac--8fda97ef76dd	8

**Recovery Options**

Logs Available	From 2008/9/17 12:25:5:961 (GMT)	To 2008/9/17 13:1:6:211 (GMT)
----------------	----------------------------------	-------------------------------

**Recovery Based On**

☐ Using Time
 ☒ Using Application consistency & Event based

Figure 45



### Notes:

To perform a time based recovery select the option **“Using time”**

**Step 3.** Select the tag from the “Search Result “. Select the “Drive Type” as “Physical” , select the LV corresponding to the newly created virtual disk under the “Physical Drives” and click on “Save”. Refer the section [Prepare for the snapshot](#) on page Step 2. 33

Search Result				
	Accuracy	Timestamp	Application	Tag Name
		2008/9/17 11:44:29:801	File System	FileSystem48d0ed9d
		2008/9/17 11:44:29:801	User Defined	my tag

<< < 1 > >>

Recovery Points Accuracy: - Exact - Approximate - Not guaranteed

Drive Type	
<input checked="" type="radio"/> Physical	<input type="radio"/> Virtual

Physical Drives					
	Host	Drive	Capacity	Filesystem	Mount Point
<input type="checkbox"/>	CITRIX2	/dev/sda3	151789317120		
<input checked="" type="checkbox"/>	CITRIX2	/dev/mapper/VG_XenStorage--b36a186f--0046--8c95--9b19--c91d0f460756--LV--34bc8ceb--56d9--4c71--acac--ab7017846440	8589934592		/mnt/Snap1

**Newly created disk**

Figure 46

**Step 4.** Click on “Recovery” to monitor the snapshot progress.

Recovery Pair Status									
	Host	Host Drive	Recovery Drive	Drive Type	Status	Progress	Expected Recovery Point	Actual Recovery Point	Recovery based on
	CITRIX2	/dev/mapper/VG_XenStorage--04f08ff2--d086--3264--bd62--4c16ed9148c9--LV--2ec05fb7--a142--455c--baac--8fda97ef76dd	/dev/mapper/VG_XenStorage--b36a186f--0046--8c95--9b19--c91d0f460756--LV--34bc8ceb--56d9--4c71--acac--ab7017846440	WAN Drive	Complete	100%	2008/9/17 12:59:19:381	-	Tag Based Tag my tag Accuracy
<input type="button" value="Release Drive"/> <input type="button" value="Force Delete"/>									

Figure 47

## Swap device

**Step 1.** Once the snapshot is complete, access the XenCenter interface and click on “Storage” tab then on “Attach”.

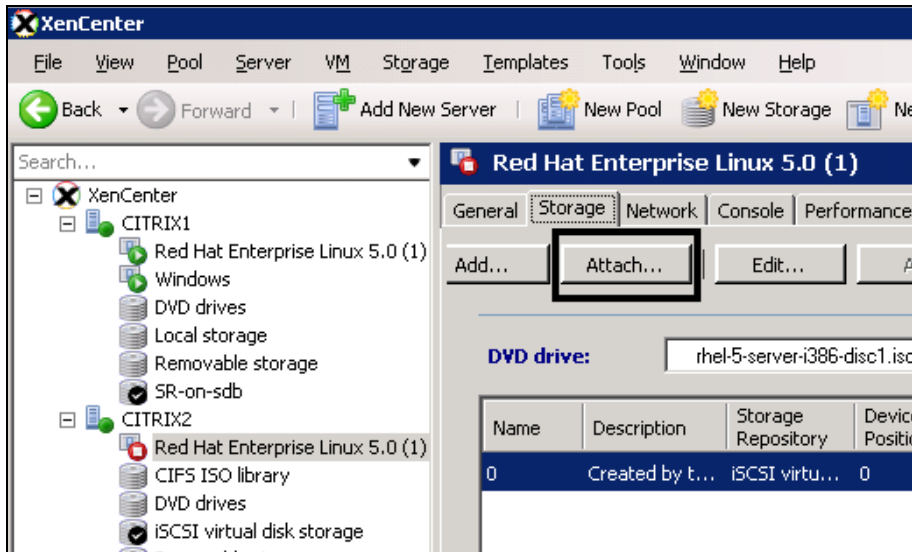


Figure 48

**Step 2.** Select the newly created virtual volume and click on “Attach”

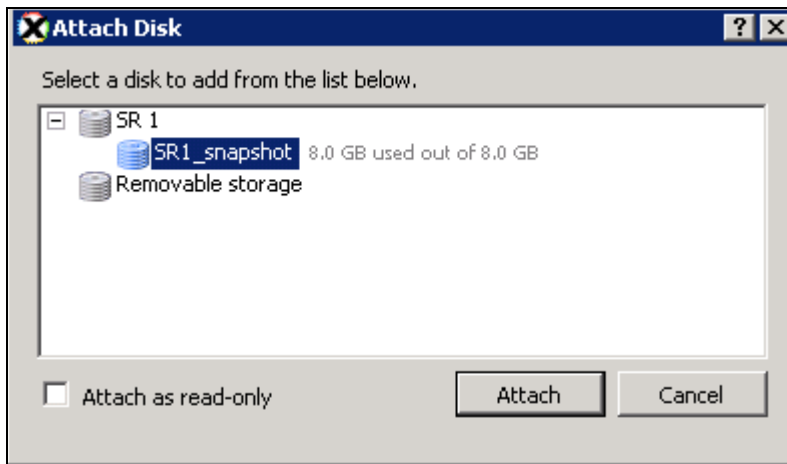


Figure 49

**Step 3.** Now that the snapshot disk is attached, proceed to remove the previous disk as shown in the picture.

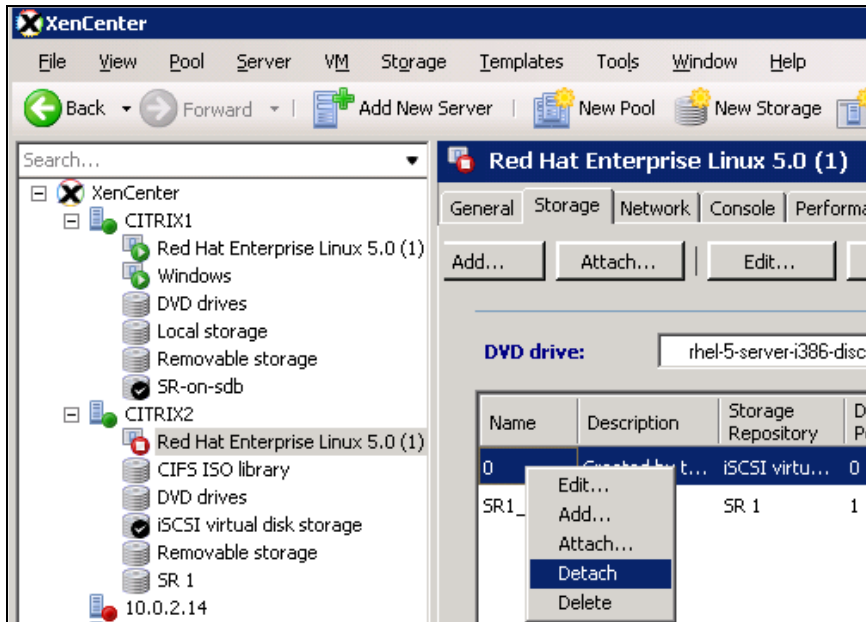


Figure 50

## Start the guest machine

**Step 4.** Then start the guest machine. Now the machine will boot through the snapshot disk.

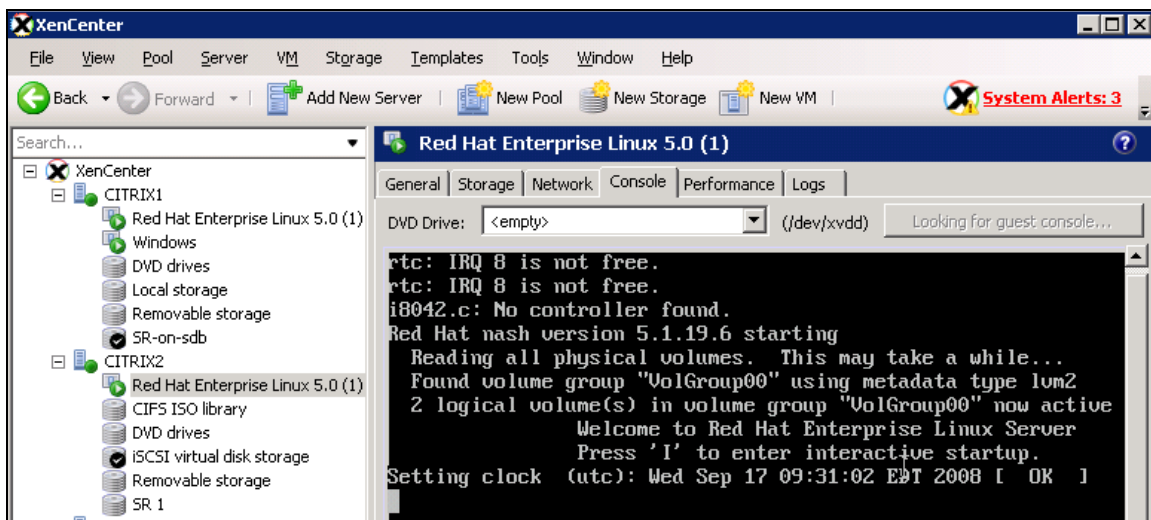


Figure 51

## 7 Failback

To perform a failback in rollback approach, set a reverse replication from the target LV to the source LV. Similarly, to perform a failback from snapshot approach perform a reverse replication from the snapshot LV to the source LV. In this example, we perform a failback from snapshot LV.

Failback is performed in four steps

- Reverse replication: A reverse replication is set to update the production volume with all the changes occurred during its outage
- Consistency tag: Consistency tags is issued to which a rollback will be performed
- Rollback: The target volume is rolled back to a consistency tag
- Start guest machine: The guest machine should boot up with the rolled back volume.



Figure 52

### 7.1 Reverse replication

**Step 1.** Set a reverse replication from the snapshot LV to the source LV with media retention as shown in the picture below.

Protection Status										
Logged in as 'admin' - <a href="#">Logout</a>			Server Time: Sep-17-2008 19:18:06							
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
CITRIX2->CITRIX1	/dev/mapper/VG_XenStorage--b36a186f--0046--8c95--9b19--c91d0f460756-LV--34bc8ceb--56d9--4c71--acac--ab7017846440 -> /dev/mapper/VG_XenStorage--9579df23--c699--6cce--9c34--54391571bcef-LV--9976628b--cf6e--4082--b877--40a153051869	Volume /dev/mapper/VG_XenStorage--9579df23--c699--6cce--9c34--54391571bcef-LV--9976628b--cf6e--4082--b877--40a153051869	0	0	0	N/A	0.42 minutes	Differential Sync	NO	<a href="#">+</a>

Figure 53

## 7.2 Consistency tag

**Step 1.** Once the replication pair reaches “**Differential Sync**”, access the guest machine then navigate to the inmage agent installation path to issue a consistency tag

```
[root@citrixguest1 ~]# ./vacp -v /dev/mapper/VolGroup00-LogVol100 -remote -server
device /dev/mapper/VG_XenStorage--b36a186f--0046--8c95--9b19--c91d0f460756-LV--3
4bc8ceb--56d9--4c71--acac--ab7017846440 -t "TAG_1" -serverip 10.0.0.42
Caught an exception with Local Configurator Settings
Generating tag names ...
Tag: FileSystem48d11083
Tag: TAG_1

Sending Following Tag Request ...
Flags = 3
Num. Volumes = 1
Volume: 1 Name: /dev/mapper/VG_XenStorage--b36a186f--0046--8c95--9b19--c91d0f46
0756-LV--34bc8ceb--56d9--4c71--acac--ab7017846440 Length:112
Num. Tags = 2
Tag: 1 Length:10
Tag: 2 Length:23
```

Figure 54

## 7.3 Rollback

**Step 1.** Rollback the target volume based on the above issued consistency tag. Refer to the section [Rollback approach](#) on page 30 to perform a rollback.



Target Drive Rollback Status								
	Host	Rollback Drive	Status	Progress	Expected Recovery Point	Actual Recovery Point	Recovery based on	Info Message
	CITRIX1	/dev/mapper/VG_XenStorage--9579df23--c699--6cce--9c34--54391571bcef-LV--9976628b--cf6e--4082--b877--40a153051869	Complete	100%	2008/9/17 14:13:23:60	-	Tag Based Tag TAG_1 Accuracy 	-
<div>Release Drive</div>								

Figure 55

## 7.4 Start the guest machine

**Step 1.** Once the rollback is complete, access the XenCenter interface to start the guest machine

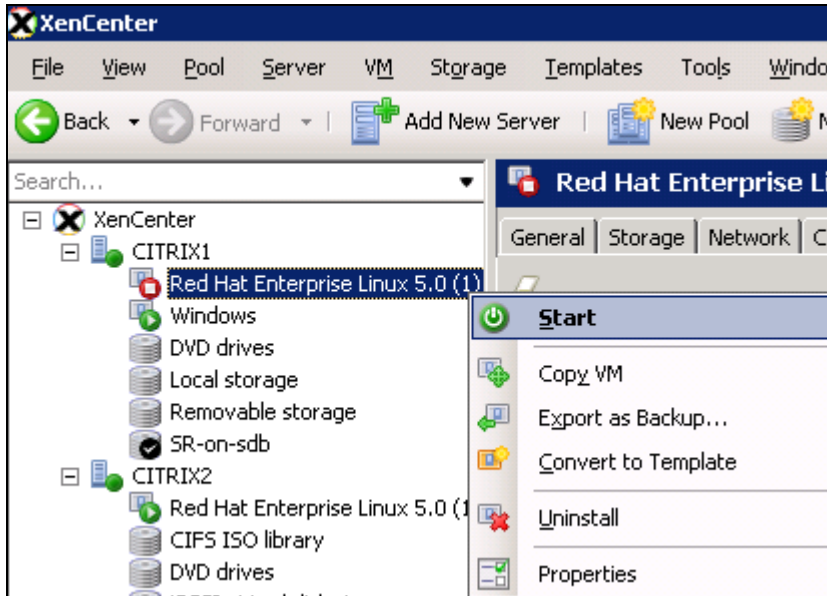


Figure 56



## Part 2: Backing up through SR approach

The SR replication, explains to replicate complete disks to the target Citrix XenServer. This part contains three sections

**Prepare:** The prepare section contains two FX jobs that are required before proceeding with the prepare section

**Protect:** This section explains to replicates source Citrix disks to target Citrix disks

**Recover:** The recover section is branched into two sub sections, the rollback approach and the snapshot approach.

## 8 Introduction to the solution

To replicate whole disks (which in turn contain volumes) as volumes from one host to another the “**drscout.conf**” file is edited to expose the disks as volumes on the CX UI.

The protect section explains to replicate and issue consistency tags on these volumes



Figure 57

Recover section explains to restore the virtual machines on the production server to the corresponding DR Server.

## 9 Prepare

Edit the file “**drscout.conf**” under the etc folder of VX installation folder and change the “**ReportFullDeviceNamesOnly**” from the default value 0 to 1. Doing this will expose the full device name to the CX UI. Ensure that you restart the VX agent service

```
IsCXPatched=1
ReportFullDeviceNamesOnly=1
CacheDirectory=/home/svsystems/
```

Figure 58

Make sure the target Citrix XenServer does not have any LVM based storage repository. If any LVM based storage repository is present then set FX job using “hard\_clean\_target.sh” as destination post script. This cleans up the DR server. Schedule the job to run on demand. Please refer to the Admin guide.pdf to set FX job



### Notes:

Target Citrix XenServer should NOT have any LVM based “storage repository” configured prior to the protection of source Citrix XenServer.

## 9.1 Cleanup

Setting up of FX job to clean up the DR server before protecting the source SRs

**Step 1.** Select the DR server as both source & target of the FX job. Specify the directory as `"/usr/local/InMage/Vx/failover_data"`

The screenshot shows the 'File Protection Wizard: Replication Pair' window. At the top, it says 'Logged in as 'admin' - Logout'. The 'Replication Hosts' section contains the following fields:

- Application Name:** Citrix Hard cleanup
- Job Description:** Cleanup job

Source		Destination	
Host	Directory	Host	Directory
<input type="radio"/> IMITS003 [Unix]		<input type="radio"/> IMITS003 [Unix]	
<input checked="" type="radio"/> IMITS137 [Unix]	<input type="text" value="/usr/local/InMage/Vx/failover_data/"/>	<input checked="" type="radio"/> IMITS137 [Unix]	<input type="text" value="/usr/local/InMage/Vx/failover_data/"/>

Below the table, there is a 'Template not selected' dropdown menu. At the bottom are 'Next ->' and 'Cancel' buttons.

Figure 59

**Step 2.** Enter the post script for destination as `"<VX installation path> /scripts/hard_clean_target.sh"` and click on **"Finish"**

The screenshot shows the 'File Protection Wizard: Replication Pair' window, specifically the 'Post execution script pathname (destination)' field. The 'Pull data from source to target' option is selected. The 'Post execution script pathname (destination)' field contains the path `/usr/local/InMage/Vx/scripts/hard_clean_target.sh`. The 'Catch All job modifier' field is empty, with the text 'for power users only' next to it. At the bottom are '<- Back', 'Finish ->', and 'Cancel' buttons.

Figure 60

**Step 3.** Set the scheduling of the job to **“Run On Demand”**. This job should be run only once before setting up replication pairs to protect the storage repositories of the production server.

Group Schedule						
Schedule Type		Schedule Time				
Once At		On Demand				
Set Schedule						

Replication Jobs						
		Application Name	Source Host	Source Directory	Target Host	Target Directory
Run order 1						
<input type="radio"/>		Citrix Hard cleanup	IMITS003	/usr/local/InMage/Vx/failover_data/	IMITS137	/usr/local/InMage/Vx/failover_data/
<div> Details Remove Cancel </div> <div> Add Job </div> <div> Finish </div>						

**Figure 61**

## 9.2 Discovery

Set FX job to relay the metadata of the VMs of production server to the DR Server. Use `xenserver_failover_prescript_sr.sh` as the source prescript to set the FX job. Schedule the job to run at a time interval or run on demand. The time interval should be decided based on the frequency of changes to VM metadata (e.g., 15 minutes.).

**Step 1.** Select the Production sever as source and DR server as destination of the FX job. Enter the source and destination directory as “<VX\_INSTALL\_PATH>/failover\_data” and click on “Next”

The screenshot shows the 'File Protection Wizard: Replication Pair' window. At the top, it says 'Logged in as 'admin' - Logout'. The main section is titled 'Replication Hosts'. It contains fields for 'Application Name' (Citrix Discover) and 'Job Description' (Citrix Discover for Metadata). Below these are two columns: 'Source' and 'Destination'. Each column has a 'Host' section with radio buttons for 'IMITS003 [Unix]' and 'IMITS137 [Unix]'. The 'IMITS137 [Unix]' option is selected in both. Below the hosts are 'Directory' fields, both containing '/usr/local/InMage/Vx/failover\_data/'. At the bottom, there is a 'Template not selected' dropdown and 'Next ->' and 'Cancel' buttons.

Figure 62

**Step 2.** Select the “Copy the contents of the source directory directly into the target directory option” as shown below

The screenshot shows the 'Options' screen. It has a section titled 'File/Directory Options'. There are five options with checkboxes: 'Copy the source directory to a subdirectory of the target directory' (unchecked), 'Copy the contents of the source directory directly into the target directory' (checked), 'Always perform checksum' (checked), 'Checksum block size: 8192' (with a text input field), 'Whole files (no incremental checks)' (unchecked), and 'Create backup files' (unchecked).

Figure 63

**Step 3.** Enter the pre script for the source as

“<VX\_INSTALL\_PATH>/scripts/xenserver\_failover\_prescript\_sr.sh” and click on “Finish”

	Pull data from source to target
CPU throttle (source)	<input type="text" value="0"/>
Send RPO alert if	<input type="text" value="0"/> minutes passed
Send E-mail alert if	<input type="text" value="5"/> minutes passed without job progress
Pre execution script pathname	<input type="text" value="/usr/local/InMage/Vx/scripts/xenserver_failover_prescript_sr.sh"/>
Post execution script pathname	<input type="text"/>
Pre execution script pathname (destination)	<input type="text"/>
Post execution script pathname (destination)	<input type="text"/>
Catch All job modifier	<input type="text"/> for power users only
<div style="text-align: right;"> <input type="button" value="← Back"/> <input type="button" value="Finish →"/> <input type="button" value="Cancel"/> </div>	

**Figure 64**

**Step 4.** Set the job to “Run On Demand”. It can be scheduled to run at an interval also. The schedule type has to be decided based on the protection type, managed or unmanaged. For managed protection “Run On Demand” schedule would suffice.

Group Schedule						
Schedule Type		Schedule Time				
Once At		On Demand				
<input type="button" value="Set Schedule"/>						
Replication Jobs						
		Application Name	Source Host	Source Directory	Target Host	Target Directory
Run order 1						
<input type="radio"/>		Citrix Discover	IMITS003	/usr/local/InMage/Vx/failover_data/	IMITS137	/usr/local/InMage/Vx/failover_data/
<input type="button" value="Details"/> <input type="button" value="Remove"/> <input type="button" value="Cancel"/>						
<input type="button" value="Add Job"/>						
<input type="button" value="Finish"/>						

**Figure 65**

**Step 5.** Click on **“File Protection”** then select the job and click on **“Start”** to start the job.

## File Protection

Logged in as 'admin' - [Logout](#)

Server Time: Aug-26-2008 20:25:11

Applications

Filter: Application Name

Sort by:

Application Per Page: 5

Jobs Per Page: 5

Go

Citrix Discover

	Job Description	Status	Source Host	Source Directory	Target Host	Target Directory	RPO	Scheduled Type	GID	JID	Job Order	Scheduled Start Time	Trending
<input type="radio"/>	citrix discover for metadata...	Starting...	IMITS003	/usr/local/InMage/Vx/failover_data/	IMITS137	/usr/local/InMage/Vx/failover_data/	N/A	on demand	10	10	0	2008-08-26 20:25:11	N/A

Results 1-1 of 1 << < 1 > >>

Stop

Start

Details

Remove

Displaying 1 to 1 (of 1 Applications)

Result Pages:1

New Job Group Wizard

Manage Templates

**Figure 66**

You may monitor the log file of the FX job. Once the discovery is complete, proceed to setting up the VX replication pairs.

## Log Detail

Logged in as 'admin' - [Logout](#)

Return to Status

Job Instance 27(TargetLog)

Job Instance 27(SourceLog)

27

```
[Precommand started at Tue Aug 26 20:38:45 2008]
Deleting stale meta data information...
Export succeeded
Export succeeded
Successfully exported the VM meta data to
/usr/local/InMage/Vx/scripts/../../failover_data/exported_vmmetadata.xml1
/usr/local/InMage/Vx/scripts/../../failover_data/exported_vmmetadata.xml2
File descriptor 3 left open
File descriptor 4 left open
Successfully persisted volume group configuration of source host to /usr/local/InMage/Vx/scripts/../../failover_data/vgs.src
[Script returned 0 at Tue Aug 26 20:38:46 2008]
```

**Figure 67**

## 10 Protect

### 10.1 VX replication

**Step 1.** Then switch to the CX UI to replicate the disk which now appears as a volume. Click on **“Volume Protection”** and select the corresponding volume and click on **“Start Replication”**

Volume Protection: Source Site  
Logged in as 'admin' - [Logout](#)

Source | Target

Protected Drives

Server	Pri Volume	FS	Application
IMITS003	/dev/sda	N/A	Unknown
IMITS003	/dev/sdb	N/A	Unknown
IMITS003	/dev/sdc	N/A	Unknown
IMITS003	/dev/sdd	N/A	Unknown

Primary Drives

- NODE270
- WIN32SRC1
- 70NODE1
- IMITS070
- IMITS003
- WIN32TGT1
- IMITS137
- Cluster Group(s) Volumes

Start Replication | Reset

Figure 68



#### Notes:

Target device should be either local device or device backed by Fibre Channel LUN. Failover can recover the source SR to SR of type lvm or lvmohba at target.

**Step 2.** The target screen appears, expand the DR server to select the target volume, then scroll down to set the **“Replication options”**

Host: IMITS003  
Drive: /dev/sdc  
Capacity: 21474836480

Select a target WAN volume

WAN Server	Volume	Capacity (Bytes)
IMITS137	/mnt	2001207394
IMITS137	/dev/sdc	2147483648
IMITS137	/dev/sdd	2147483648

InMageProfiler | P | 81920000

Figure 69



**Step 3.** All the process servers pointed to the CX server are listed here, you may choose a desired process server which will handle all the offload activities specific to this replication pairs. For better scalability you may point more process servers to the CX server. Select the process server and scroll down to set the “Replication Options”

Process Server	
Select Process Server	Number of Pair Configured 2
ITGTR5U2-64.inmage.in(10.0.164.73)	
w2k3-32PPS(10.0.227.227)	
SR5U2-64.inmage.in(10.0.248.73)	

Figure 70

**Step 4.** Disable “Media Retention” option and click on “Submit”

Replication Options	
<input type="checkbox"/>	Secure transport from Source to InMage CX
<input type="checkbox"/>	Secure transport from InMage CX to destination
Sync options:	Fast
Use compression:	No Compression (Overrides existing 1-N replication pairs)
Add to volume consistency group:	New Volume Group
CDP Retention	
<input type="checkbox"/>	Enable CDP Retention option
Automatic Resync Options	
<input type="checkbox"/>	Start between hours 18 : 00 and 6 : 00 after waiting 30 minutes. (All times are local to CX)
<input type="button" value="Submit"/> <input type="button" value="Cancel"/> <input type="button" value="Reset"/>	

Figure 71

**Step 5.** Once the pair is configured, access the DR server to edit “<VX installation folder>\etc\drscout.conf”. Change the “ReportFullDeviceNamesOnly” from the default value 1 to 0. Doing this will stop exposing the device name to the CX UI.

```
HostId=787ff490-f15f-4d51-965f-94958d2c48ba
RsyncTimeOut=1800
MinCacheFreeDiskSpacePercent=25
SequenceCount=0
IsCXPatched=1
UseLinuxDeviceTxt=0
ReportFullDeviceNamesOnly=0
CacheDirectory=/home/svsystems/var/
OffloadSyncSourceDirectory=/home/svsystems/
OffloadSyncCacheDirectory=/home/svsystems/var/
```

Figure 72

**Step 6.** Restart the VX agent service on the DR server

**Step 7.** Access the CX UI and navigate to “**Volume Protection**” -> “**Target**” then select the pair configured and click on “**View Details**”. Click on the “**Configure retention**” to configure media retention for this replication pair.

Retention Settings						
Retention	Retention Log size limit (in MB)	Retention Time limit	Log data directory	Disk Space Threshold (%)	Unused Space (in MB)	On insufficient disk space
Not Configured	0.00	N/A	N/A	N/A	0.00	N/A
<div> <a href="#">Edit</a> <a href="#">Enable Retention</a> <a href="#">Configure Retention</a> </div>						

**Figure 73**

**Step 8.** In the next screen select the type of retention policy to be enforced for this replication pair. You may choose time based, space based or a combination of both. Click on “**Submit**” to start the replication pair

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	1024 MB (Cannot be less than 256 MB)		
Retain changes upto the (time)	<div>(Days)</div> <div>(hrs.)</div>		
On insufficient disk space	<input checked="" type="radio"/> Purge older retention logs <input type="radio"/> Pause differentials		
Log data directory	<div>/home/ret1 (Eg:- K:\log_data)</div> <div>/home,/,/Backup are drives suggested for storing rollback log files.</div>		
Configure Threshold for Alerts			
Alert when disk space utilization reaches			80 %
<div> <a href="#">Submit</a> <a href="#">Cancel</a> </div>			

**Figure 74**

**Step 9.** The replication pair reaches “**Differential Sync**” as shown in the picture below

Protection Status

Logged in as 'admin' - [Logout](#)

Server Time: Aug-1-2008 20:19:42

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
IMITS003->IMITS137	/dev/sdc -> /dev/sdd	Volume /dev/sdd	0.06	0.9	0	N/A	0 minutes	Differential Sync	NO	

**Figure 75**

## 10.2 Consistency

To recover individual VM, you may choose to execute consistency tags on the virtual machine. Proceed to issue consistency tags through the virtual machine's command prompt. Access the source command prompt then navigate to the VX agent installation path to issue the following command

```
./vacp -remote -v <volume1>,<volume2>... -serverdevice <disk1>,<disk2>,...-  
serverip <ip address of vacp server> -t <name of the tag>
```

```
Starting device I/O resumption...  
[root@alfa ~]# ./vacp -remote -v /dev/xvda1,/dev/VolGroup00/LogVol100,/dev/VolGroup00/LogVol101 -serverdevice /dev/sdc -serverip 192.168.80.77 -t Tag_1  
Caught an exception with Local Configurator Settings  
Generating tag names ...  
Tag: FileSystem48999943  
Tag: Tag_2  
  
Sending Following Tag Request ...  
Flags = 3  
Num. Volumes = 1  
Volume: 1 Name: /dev/sdc Length:8  
Num. Tags = 2  
Tag: 1 Length:10  
Tag: 2 Length:23  
  
Starting device I/O suspension...  
  
ENTERED: ConnToVacpServer  
Connected to 192.168.80.77 at port 20003  
EXITED: ConnToVacpServer  
Elapsed time for Establishing connection: 591.000000  
Sending tags to the remote server ...  
Bytes passed to RemoteServer = 55  
Successfully sent tags to the Remote Server ...  
  
Starting device I/O resumption...  
[root@alfa ~]#
```

Figure 76

A tag can be issued at the Citrix XenServer host level also. Use “vacp” to issue tag on the block device(s). Option “-x” has to be used along with option “-v” to issue tag without any consistency mechanism. For example, to issue tag on dismantled volumes/raw devices.

```
./vacp [-v <volume1>,<volume2>..] [-t <tag1,...>] [-x] [-h]
```

```
[root@IMITS003 bin]# ./vacp -v /dev/sdc -t "Tag_1" -x  
  
Generating tag names ...  
Tag: FileSystem4892fbd3  
Tag: Tag_1  
  
Sending Following Tag Request ...  
Flags = 3  
Num. Volumes = 1  
Volume: 1 Name: /dev/sdc Length:8  
Num. Tags = 2  
Tag: 1 Length:10  
Tag: 2 Length:23  
tags successfully issued  
[root@IMITS003 bin]#
```

Figure 77

## 11 Recovery

### 11.1 Rollback

**Step 1.** To perform a recovery, switch to the CX UI and click on “**Recovery**”, then select the replication pair and click on “**Rollback**”. A confirmation appears, click on “**Ok**” to continue

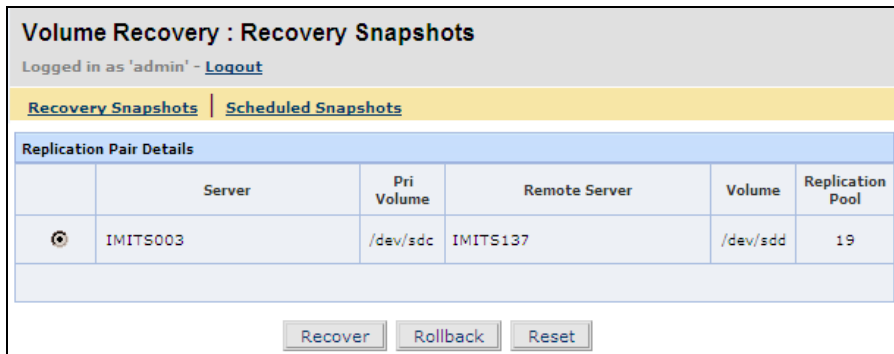


Figure 78

**Step 2.** The next screen opens up, select the option “**Using Application consistency & Event based**”, this changes the interface below to “**Search Result**” and select the consistency tag and click on “**Save**”

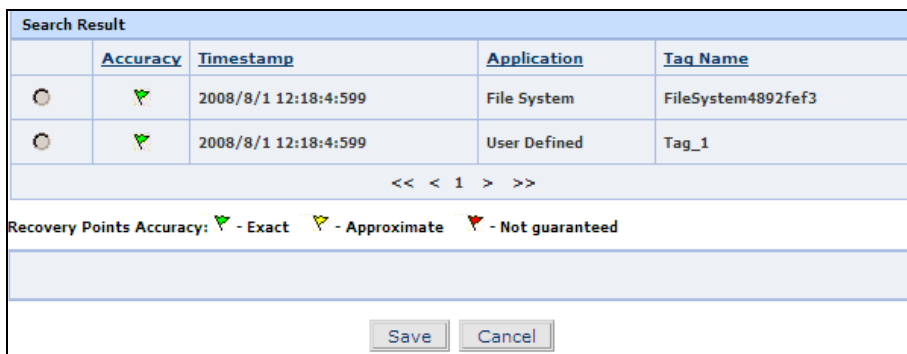


Figure 79

**Step 3.** Verify if the rollback of target volume back to the consistency point is finished.

## 11.2 Restore VMs

Run XenServer failover job to recover the storage repositories on the replicated devices & the virtual machines.

**Step 1.** Setup the failover job with source and destination as the DR Server with directory to be replicated as “<VX\_INSTALL\_PATH>/failover\_data”

The screenshot shows the 'File Protection Wizard: Replication Pair' window. At the top, it says 'Logged in as 'admin' - Logout'. The 'Replication Hosts' section contains the following fields:

- Application Name:** Citrix Failover
- Job Description:** Citrix Failover

Source		Destination	
	Host		Host
<input type="radio"/>	IMITS003 [Unix]	<input type="radio"/>	IMITS003 [Unix]
<input checked="" type="radio"/>	IMITS137 [Unix]	<input checked="" type="radio"/>	IMITS137 [Unix]
Directory		Directory	
<input type="text" value="/usr/local/InMage/Vx/failover_data/"/>		<input type="text" value="/usr/local/InMage/Vx/failover_data/"/>	

Below the table is a dropdown menu labeled 'Template not selected' with a downward arrow. At the bottom are 'Next ->' and 'Cancel' buttons.

Figure 80

**Step 2.** Enter the post script for destination as “<VX\_INSTALL\_PATH>/scripts/xenserver\_failover\_postscript\_sr.sh” and click on “Finish”

The screenshot shows the 'File Protection Wizard: Post-Execution Script' window. It contains the following fields:

- Send RPO alert if  minutes passed
- Send E-mail alert if  minutes passed without job progress
- Pre execution script pathname:
- Post execution script pathname:
- Pre execution script pathname (destination):
- Post execution script pathname (destination):
- Catch All job modifier:  *for power users only*

Figure 81

**Step 3.** Set the job to “Run on demand” and click on “Finish”

Group Schedule	
Schedule Type	Schedule Time
Once At	On Demand

Set Schedule

Replication Jobs						
	Application Name	Source Host	Source Directory	Target Host	Target Directory	
Run order 1						
<input type="radio"/>	Citrix Failover	IMITS003	/usr/local/InMage/Vx/failover_data/	IMITS137	/usr/local/InMage/Vx/failover_data/	

Details Remove Cancel

Add Job

Finish

**Figure 82**

**Step 4.** Click on “File Protection” then select the failover job and click “Start” to recover all the SRs and to restore all the VMs to the target XenServer host.

File Protection

Logged in as 'admin' - Logout Server Time: Aug-2

Applications Filter: Application Name

Application Per Page: 5 Jobs Per Page: 5

Citrix Discover

Citrix Failover

	Job Description	Status	Source Host	Source Directory	Target Host	Target Directory	RPO	Scheduled Type	GID	JID	Job Order	Sc	Sta	Tir
<input type="radio"/>	citrix failover...	Starting...	IMITS003	/usr/local/InMage/Vx/failover_data/	IMITS137	/usr/local/InMage/Vx/failover_data/	N/A	on demand	11	11	0	20	2	

Results 1-1 of 1 << < 1 > >>

Stop Start Details Remove

Displaying 1 to 2 (of 2 Applications)

New Job Group Wizard

Manage Templates

**Figure 83**



**Caution:**

The MAC addresses of the network interfaces & DHCP configured IPs of the source VM might not be retained after failover.



#### Notes:

In case of an unsuccessful failover, run `<VX_INSTALL_PATH>/“xenserver_reset_target.sh”` to reset the status (to state before the failover attempt) of target XenServer before a re-attempt of failover.

Currently we do not support recovering virtual machines that span across multiple storage repositories.

## 12 Failback

To perform a failback in rollback approach, set a reverse replication from the target SR to the source SR. Similarly, to perform a failback from snapshot approach, perform a reverse replication from the snapshot SR to the source SR. In this example, we perform a failback from snapshot SR.

Failback is performed in four steps

- Reverse replication: A reverse replication is set to update the production volume with all the changes occurred during its outage
- Consistency tag: Consistency tags is issued to which a rollback will be performed
- Rollback: The target volume is rolled back to a consistency tag
- Start guest machine: The guest machine should boot up with the rolled back volume.



Figure 79

### 12.1 Reverse replication

**Step 1.** Set a reverse replication from the snapshot SR to the source SR with media retention. The section [11.1 VX Replication](#) can be referred.

## 12.2 Consistency tag

**Step 2.** Once the replication pair reaches “**Differential Sync**”, access the guest machine then navigate to the inimage agent installation path to issue a consistency tag. The section [11.2 Consistency](#) can be referred.

## 12.3 Rollback

**Step 3.** Rollback the target volume based on the above issued consistency tag. Refer to the section [Rollback approach](#) on page 30 to perform a rollback.

## 12.4 Start the guest machine

**Step 4.** Once the rollback is complete, access the XenCenter interface to start the guest machines



## **Part 3: Backing up XenServer resource pool through LV replication**

## 13 Introduction to the solution

This solution document describes how to backup/restore a XenServer pool to another Citrix XenServer. The production Citrix XenServer will be referred to as the source Citrix XenServer and the DR Citrix XenServer will be referred to as a target Citrix XenServer.

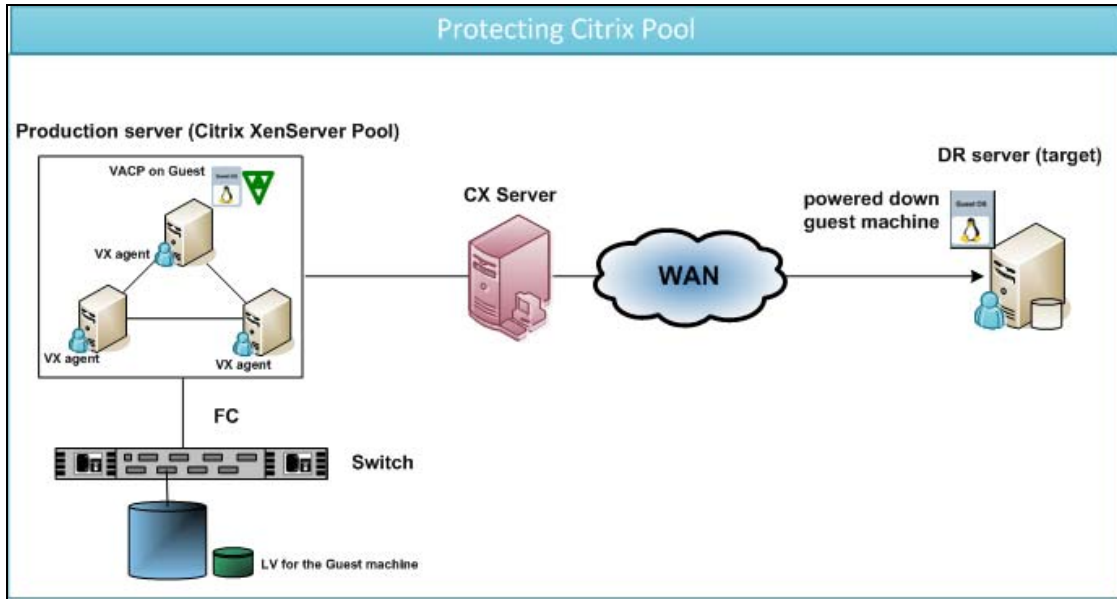
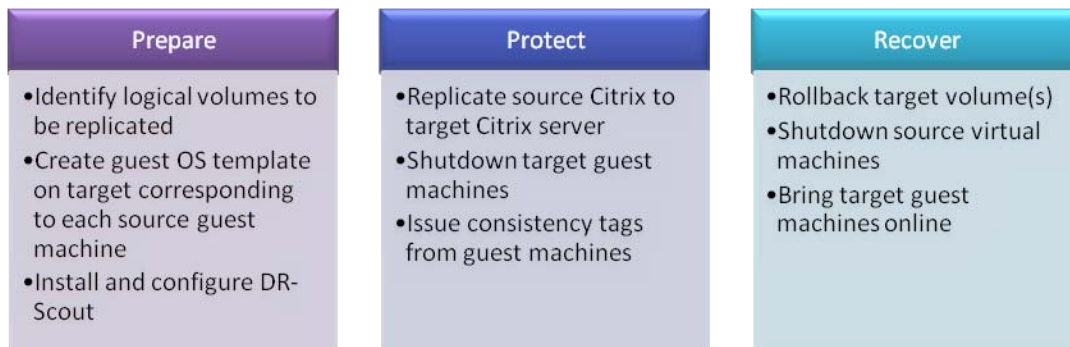


Figure 84

The solution is divided into three steps, i.e.

### [Prepare](#)

This section includes installing the CX server and VX agents on the all XenServer pool servers and the target Citrix XenServer for DR. Then create the guest machines on target that correspond to the source guest machines with the same disk size.



**Figure 85**

### [Protect](#)

Once the guest machines are created on the target shutdown the guest machines and proceed to set the replication pair(s) from source Citrix to target Citrix server. Shutdown the target guest machine(s). Set a consistency job to issue consistency tags on the source volume(s) at regular intervals.

### [Recover](#)

Stop the source guest machines and rollback the target volumes either through the CX UI or through CLI. Then start the target guest machines.



#### **Caution:**

This solution is for virtual machines based on LVMs.  
Ensure that you have execute privileges for vacp scripts

# 14 Prepare

Access the target Citrix Xen Server and create the guest machines with the same disk capacity.  
Install the VX agent on all pool members

# 15 Protect

## 15.1 Set replication pairs

Access the CX UI to replicate the guest machines (these are virtual machines on the production Citrix XenServer pool). Guest machines belonging to a pooled Citrix XenServer will appear as cluster volumes.

**Step 1.** Click on “**Volume protection**” then expand the “**Xen Pools**” to find the cluster group corresponding to the guest machine. Click on “**Start Replication**”

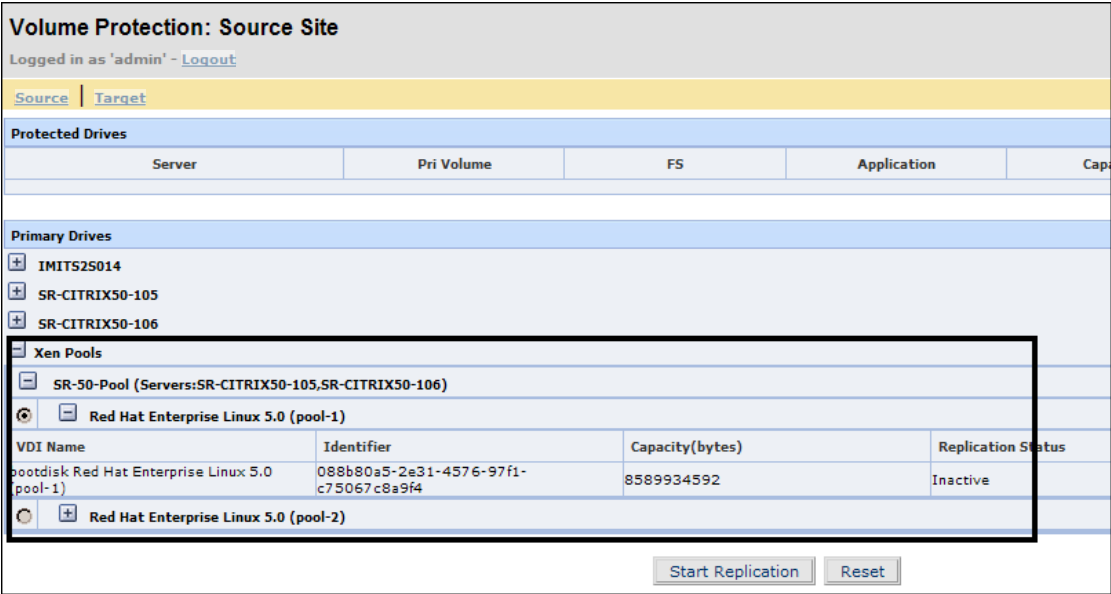


Figure 86

**Step 2.** Select the volume from the group and click on “Next”

**Volume Replication: Pool Setup**

Pool: SR-50-Pool  
Vm: Red Hat Enterprise Linux 5.0 (pool-1)

Configured Pool Drives				
	Primary Server	Primary Volume	Remote Server	Remote Volume
<input type="button" value="Finish"/> <input type="button" value="Remove"/> <input type="button" value="Reset"/> <input type="button" value="Cancel"/>				

Unconfigured Pool Drives						
	Server	Pri Volume	FS	Capacity (Bytes)	Last VX Sentinel Heartbeat Time	Replication Status
<input checked="" type="radio"/>	SR-CITRIX50-105,SR-CITRIX50-106	088b80a5-2e31-4576-97f1-c75067c8a9f4(bootdisk Red Hat Enterprise Linux 5.0 (pool-1))		8589934592	0000-00-00 00:00:00	Inactive

**Figure 87**

**Step 3.** The next screen opens up, expand the target Citrix Xen Server to select the target volume, then scroll down to set the “Replication Options”

Pool: SR-50-Pool  
Vm: Red Hat Enterprise Linux 5.0 (pool-1)

Drive: 088b80a5-2e31-4576-97f1-c75067c8a9f4(bootdisk Red Hat Enterprise Linux 5.0 (pool-1))  
Capacity: 8589934592

Select a target WAN volume

	WAN Server	Volume	Capacity (Bytes)	Free Space (Bytes)
<input type="checkbox"/>	IMITS2S014			
<input type="radio"/>	IMITS2S014	/dev/mapper/VG_XenStorage--762cd0b1--06b3--6eaa--989f--502242dd3433-LV--601d7919--1c57--49aa--8ddf--0845ed1ef80a	8589934592	
<input checked="" type="radio"/>	IMITS2S014	/dev/mapper/VG_XenStorage--762cd0b1--06b3--6eaa--989f--502242dd3433-LV--7301749e--0ef1--4ecd--9a0b--a1f2d90b4074	8589934592	
<input type="radio"/>	IMITS2S014	/dev/mapper/VG_XenStorage--762cd0b1--06b3--6eaa--989f--502242dd3433-LV--a0432d5a--b20f--	8589934592	

**Figure 88**

**Step 4.** All the process servers pointed to the CX server are listed here, you may choose a desired process server which will handle all the offload activities specific to this replication pairs. For better scalability you may point more process servers to the CX server. Select the process server and scroll down to set the “**Replication Options**”

Process Server	
<div> <div>Select Process Server</div> <div>ITGTR5U2-64.inmage.in(10.0.164.73)</div> <div>w2k3-32PPS(10.0.227.227)</div> <div>SR5U2-64.inmage.in(10.0.248.73)</div> </div>	<div>Number of Pair Configured</div> <div>2</div>

Figure 89

**Step 5.** Ensure that the “**Media Retention**” option is enabled, the rest of the features are optional. Click on “**Submit**” to continue

Replication Options	
<input type="checkbox"/>	Secure transport from Source to InMageCX
<input type="checkbox"/>	Secure transport from InMage CX to destination
Sync options:	Fast
Use compression:	CX Based Compression (Overrides existing 1-N replication pairs)
Add to volume consistency group:	New Volume Group
Media Retention	
<input checked="" type="checkbox"/>	Enable Media Retention option
Automatic Resync Options	
<input type="checkbox"/>	Start between hours 18 : 00 and 6 : 00 after waiting 30 minutes. (All times are local to CX)
<div>Submit</div> <div>Cancel</div> <div>Reset</div>	

Figure 90

**Step 6.** By enabling the Media Retention option, you will require to define a retention policy.  
 Select the desired retention policy such as time based, space based or a combination of both.  
 Click on “**Submit**” to continue

### Volume Protection: Retention Options

Logged in as 'admin' - [Logout](#)

Pair Details			
Server	Pri Volume	Remote Server	Volume
SR-CITRIX50-105,SR-CITRIX50-106	/dev/mapper/VG_XenStorage--3b2dcfb3--0327--2d78--64a6--7581d66554ec-LV--088b80a5--2e31--4576--97f1--c75067c8a9f4	IMITS2S014	/dev/mapper/VG_XenStorage--762cd0b1--06b3--6eaa--989f--502242dd3433-LV--7301749e--0ef1--4ecd--9a0b--a1f2d90b4074

#### Retention Logging Policy

Retention Policy	Roll-backward		
Retention Log Size	0.00 (MB)	Current Retention Log Size	0.00 (MB)
Unused Space	2.00 (MB)		
Retain changes upto	512 MB (Cannot be less than 256 MB)		
Retain changes upto the (time)	<div>Days</div> <div>hrs.</div>		
On insufficient disk space	<input checked="" type="radio"/> Purge older retention logs <input type="radio"/> Pause differentials		
Log data directory	/mnt/Ret_logs_DB (Eg:- K:\log_data) <small>./,mnt are drives suggested for storing rollback log files.</small>		

#### Configure Threshold for Alerts

Alert when disk space utilization reaches	80 %
---	------

Submit

Cancel

Figure 91

**Step 7.** Select the replication pair and click on “**Finish**” to start the replication pair

### Volume Replication: Pool Setup

Pool: SR-50-Pool  
 Vm: Red Hat Enterprise Linux 5.0 (pool-1)

Configured Pool Drives	
	Primary Server
	SR-CITRIX50-105,SR-CITRIX50-106

	Primary Volume
	/dev/mapper/VG_XenStorage--3b2dcfb3--0327--2d78--64a6--7581d66554ec-LV--088b80a5--2e31--4576--97f1--c75067c8a9f4

Finish

Remove

Reset

Cancel

Figure 92

**Step 8.** This will start the replication pair. Shutdown the target guest machines. The replication pair will reach “**Differential Sync**”

Protection Status

Logged in as 'admin' - [Logout](#)

Server Time: Nov-21-2008 18:47:2

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
Cluster, Group:Red Hat Enterprise Linux 5.0 (1) Servers: CITRIX104A,CITRIXGUEST2->IMIT2S014	/dev/mapper/VG_XenStorage--3b2dcbf3--0327--2d78--64a6--7581d66554ec-LV--4ee9b508--05bf--4fa9--9383--0004f47f17ec -> /dev/mapper/VG_XenStorage--de5c17d0--c099--8e7c--e898--e59ce300a85b-LV--642fc1b2--c6c5--4121--9fb7--c239110692b5	Volume /dev/mapper/VG_XenStorage--de5c17d0--c099--8e7c--e898--e59ce300a85b-LV--642fc1b2--c6c5--4121--9fb7--c239110692b5	0	0.01	1112.51	N/A	48.18 minutes	Differential Sync	NO	<a href="#">+</a>

**Figure 93**

**Step 9.** Make sure, after shutting down the VM, all the protected logical volumes (corresponding to the virtual disks of the VM that was shutdown) are available or not. If any protected logical volume is not available, run “**lvchange -ay <Logical\_Volume>**” to make the logical volume available.



## 15.2 Consistency tags

Access the source guest machine and issue consistency tags. These tags later act as markers to which you may perform a recovery. In this example consistency tag is issued manually, you may however choose to schedule this through a cron job.

**Step 1.** To issue a consistency tag, you will need to download the appropriate vacp script. You can download this off the CX UI by navigating to “**System-> Agent installers**”



Figure 94

**Step 2.** Ensure that the script is given execute privilege before you issue the following command

```
./vacp32 -v <LogicalVolume> -remote -serverdevice < source volume > -t  
<Name of the tag> -serverip <Citrix XenServer on which the guest is active> -  
serverport 20003
```

```
[root@citrixguest1 tmp]# ./vacp32 -v /dev/mapper/VolGroup00-LogVol100 -remote -se  
rverdevice /dev/UG_XenStorage-3b2dcbf3-0327-2d78-64a6-7581d66554ec/LV-088b80a5-2  
e31-4576-97f1-c75067c8a9f4 -t Tag1 -serverip 10.0.104.106 -serverport 20003  
Caught an exception with Local Configurator Settings  
Generating tag names ...  
Tag: FileSystem4946c06e  
Tag: Tag1  
  
Sending Following Tag Request ...  
Flags = 3  
Num. Volumes = 1  
Volume: 1 Name: /dev/UG_XenStorage-3b2dcbf3-0327-2d78-64a6-7581d66554ec/LV-088b  
80a5-2e31-4576-97f1-c75067c8a9f4 Length:95  
Num. Tags = 2  
Tag: 1 Length:9  
Tag: 2 Length:23  
  
Starting device I/O suspension...  
  
ENTERED: CommToUacpServer  
Connected to 10.0.104.106 at port 20003  
EXITED: CommToUacpServer  
Elapsed time for Establishing connection: 4291.000000
```

Figure 95


## 16 Recover

To recovery you will need to roll back the target volume back to a consistent point. Ensure that the source guest machines are shutdown before performing a rollback.

**Step 1.** Click on “**Recovery**” on the CX UI, select the replication pair to be rolled back and click on “**Rollback**”. You will be prompted for a confirmation, click on “**Ok**” to continue

**Volume Recovery : Recovery Snapshots**  
 Logged in as 'admin' - [Logout](#)

[Recovery Snapshots](#) | [Scheduled Snapshots](#)

Replication Pair Details					
	Server	Pri Volume	Remote Server	Volume	Replication Pool
	Pool : SR-50-Pool, Vm : Red Hat Enterprise Linux 5.0 (pool-1), Servers : SR-CITRIX50-105,SR-CITRIX50-106	088b80a5-2e31-4576-97f1-c75067c8a9f4(bootdisk Red Hat Enterprise Linux 5.0 (pool-1))	IMITS2S014	/dev/mapper /VG_XenStorage--762cd0b1--06b3--6aaa--989f--502242dd3433-LV--7301749e--0ef1--4ecd--9a0b--a1f2d90b4074	4

[Recover](#)
[Rollback](#)
[Reset](#)

Figure 96

**Step 2.** The next screen appears, select the “**Using Application consistency & Event based**” option

**Volume Recovery: Recovery SnapShot Options**  
 Logged in as 'admin' - [Logout](#)

Pair Details				
Server	Primary Volume	Remote Server	Target Volume	Replication Pool
Pool: SR-50-Pool, Vm: Red Hat Enterprise Linux 5.0 (pool-1), Servers: SR-CITRIX50-105,SR-CITRIX50-106	088b80a5-2e31-4576-97f1-c75067c8a9f4(bootdisk Red Hat Enterprise Linux 5.0 (pool-1))	IMITS2S014	/dev/mapper /VG_XenStorage--762cd0b1--06b3--6aaa--989f--502242dd3433-LV--7301749e--0ef1--4ecd--9a0b--a1f2d90b4074	4

**Recovery Options**

Logs Available	From 2008/12/15 19:33:38:868 (GMT)	To 2008/12/15 20:39:10:308 (GMT)
Recovery Based On		
<input type="radio"/> Using Time <input checked="" type="radio"/> Using Application consistency & Event based		

Figure 97

**Step 3.** You should see the interface change to the search result as shown below. Select the desired consistency tag to which the target volume will be rolled back and click on “Save”








Search Result				
	Accuracy	Timestamp	Application	Tag Name
		2008/12/15 20:39:10:308	File System	FileSystem4946c06e
		2008/12/15 20:39:10:308	User Defined	Tag1
<< < 1 > >>				
Recovery Points Accuracy:  - Exact  - Approximate  - Not guaranteed				
<div>Save Cancel</div>				

Figure 98

**Step 4.** The roll back will soon complete then proceed to the next step






Target Drive Rollback Status								
	Host	Rollback Drive	Status	Progress	Expected Recovery Point	Actual Recovery Point	Recovery based on	Info Message
	IMITS2S014	/dev/mapper/VG_XenStorage--762cd0b1--06b3--6eaa--989f--502242dd3433-LV--7301749e--0ef1--4ecd--9a0b--a1f2d90b4074	Complete	100%	2008/12/15 20:39:10:308	-	Tag Based Tag Tag1 Accuracy 	-
<div>Release Drive</div>								
Recovery Points Accuracy:  - Exact  - Approximate  - Not guaranteed								

Figure 99

**Step 5.** Start the guest machines on the target Citrix Xen Server, they should come up normally without requiring any configuration changes

## **Part 4: Pool – Pool LV Solution**

This solution document explains backing up and restoring an entire XenServer resource pool to a DR XenServer pool. The source XenServer pool will be referred to as the production XenServer pool and the target XenServer pool will be referred to as a DR XenServer pool.

## 17 Introduction to the solution

The solution is divided into three steps, i.e.

### Prepare

This section includes installing the CX server and VX agents on the all members of the production as well as DR XenServer pool members. Then create the virtual disks in the target SR that are of the same size as that of the virtual disks of the guest machines to be protected.

### Protect

Once the virtual disks are created on the target, proceed to set the replication pair(s) from production XenServer resource pool to corresponding virtual disk at DR XenServer resource pool. Set consistency job(s) for each protected guest machine to issue consistency tags on the source volume(s) at regular intervals.

### Failover

There are two approaches to perform a failback. The rollback approach requires you to stop the replication pair and then perform a failover. The snapshot approach on the other hand is non disruptive and preferred when testing the solution.

### Failback

When the production XenServer is back online and ready to resume its role, a failback is performed to update the production XenServer with all the changes occurred during its outage. This is similar to that of a planned failover.



#### **Caution:**

Do not associate the virtual disks created in the target SR with any of the VM's as long as the replication pair is alive.

Ensure that you have execute privileges for vacp scripts.

## 18 Prepare

This section includes installing the CX server and VX agents on the all members of the production as well as DR XenServer pool members.

Create the virtual disks, within shared SR of DR XenServer resource pool, that are of the same size as the virtual disks of the guest machines to be protected.

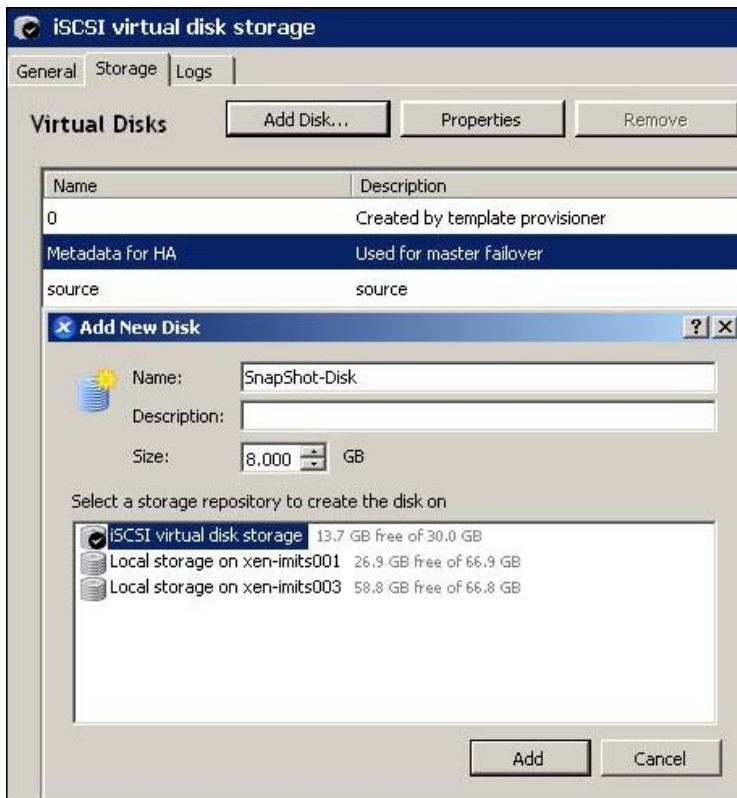


Figure 100

# 19 Protect

## 19.1 Set replication pairs

**Step 1.** Switch to the DR XenServer pool to identify the logical volume that corresponds to the newly created virtual disk then run the command “**lvchange -ay <DEVICE\_PATH>**” on a pool member that acts as target for the replication pair. This will activate the logical volume on that pool member.

```
[root@xen-imits001 ~]# lvchange -a y /dev/VG_XenStorage-0e54c82e-5991-8093-6c91-dfebcb899bc40/LV-73f07999-ba97-4a66-a71d-2356246dd1c4
```

Figure 101

**Step 2.** Access the CX UI & replicate all the virtual disks of the guest machines on the production XenServer pool). Guest machines belonging to a pooled Citrix XenServer will appear as Xen Pool volumes. Click on “**Volume protection**” then expand “**Xen Pools**” to find the virtual disk corresponding to the guest machine. Click on “**Start Replication**”

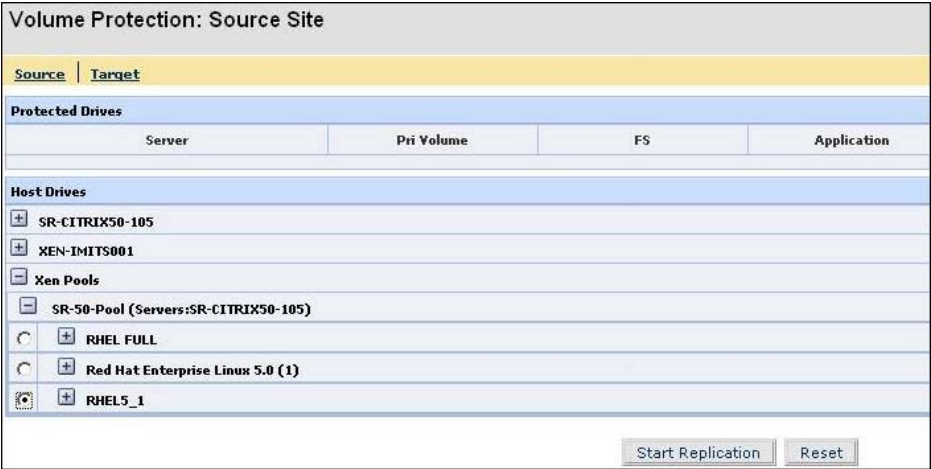


Figure 102

**Step 3.** In the next screen, expand the target XenServer pool member to select the target volume, then scroll down to set the “Replication Options”

Drive: e9eb2e97-4b03-476b-9934-b7b0a6337f2f(RHEL5\_1)  
Capacity: 8589934592

Select a target WAN volume				
	WAN Server	Volume	Capacity (Bytes)	Free Space (Bytes)
+ SR-CITRIX50-105				
- XEN-IMITS001				
<input checked="" type="radio"/>	XEN-IMITS001	/dev/mapper/VG_XenStorage--0e54c82e--5991--8093--6c91--dfc899bc40-LV--73f07999--ba97--4a66--a71d--2256246dd1c4	8589934592	
<input type="radio"/>	XEN-IMITS001	/dev/mapper/VG_XenStorage--0e54c82e--5991--8093--6c91--dfc899bc40-LV--885f3bf0--2847--45aa--94b1--f169533fdcc4	4194304	
<input type="radio"/>	XEN-IMITS001	/dev/mapper/VG_XenStorage--0e54c82e--5991--8093--6c91--dfc899bc40-LV--f4369d08--6e84--4b94--b546--a690fa24ed3d	8589934592	
<input type="radio"/>	XEN-IMITS001	/dev/mapper/VG_XenStorage--44d446d9--4e6a--1490--6688--dd54a228455b-LV--57a5bab4--322d--445e--a7eb--6d646afa7c4	8589934592	
<input type="radio"/>	XEN-IMITS001	/dev/sda2	4104414720	
<input type="radio"/>	XEN-IMITS001	/dev/sdb1	159998114304	
<input type="radio"/>	InMageProfiler	p	81920000	81

**Figure 103**

**Step 4.** All the process servers pointed to the CX server are listed here, you may choose a desired process server which will handle all the offload activities specific to this replication pairs. For better scalability you may point more process servers to the CX server. Select the process server and scroll down to set the “Replication Options”

Process Server	
<div> Select Process Server  ITGTR5U2-64.inmage.in(10.0.164.73)  w2k3-32PPS(10.0.227.227)  SR5U2-64.inmage.in(10.0.248.73) </div>	Number of Pair Configured  2

**Figure 104**



**Step 5.** Ensure that the “Media Retention” option is enabled, the rest of the features are optional. Click on “Submit” to continue

Replication Options	
<input type="checkbox"/>	Secure transport from Source to InMageCX
<input type="checkbox"/>	Secure transport from InMage CX to destination
Sync options:	Fast
Use compression:	CX Based Compression (Overrides existing 1-N replication pairs)
Add to volume consistency group:	New Volume Group
Media Retention	
<input checked="" type="checkbox"/>	Enable Media Retention option
Automatic Resync Options	
<input type="checkbox"/>	Start between hours 18 : 00 and 0 : 00 after waiting 30 minutes. (All times are local to CX)
<input type="button" value="Submit"/> <input type="button" value="Cancel"/> <input type="button" value="Reset"/>	

Figure 105

**Step 6.** By enabling the Media Retention option, you will require to define a retention policy.  
 Select the desired retention policy such as time based, space based or a combination of both.  
 Click on “Submit” to continue

Volume Protection: Retention Options			
Logged in as 'admin' - <a href="#">Logout</a>			
Pair Details			
Server	Pri Volume	Remote Server	Volume
CITRIX104A,CITRIXGUEST2	/dev/mapper/VG_XenStorage-3b2dcbf3--0327--2d78--64a6--7581d66554ec-LV--4ee9b508--05bf--4fa9--9383--0004f47f17ec	IMIT2S014	/dev/mapper/VG_XenStorage-de5c17d0--c099--8e7c--e898--e59ce300a85b-LV--642fc1b2--c6c5--4121--9fb7--c239110692b5
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	MB (Cannot be less than 256 MB)		
Retain changes upto the (time)	1 (Days) (hrs.)		
On insufficient disk space	<input checked="" type="radio"/> Purge older retention logs <input type="radio"/> Pause differentials		
Log data directory	/mntAog1 (Eg:- K:\log_data) /mnt are drives suggested for storing rollback log files.		
Configure Threshold for Alerts			
Alert when disk space utilization reaches	80 %		
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>			

Figure 106

**Step 7.** Select the replication pair and click on **“Finish”** to start the replication pair.

**Step 8.** This will start the replication pair. The replication pair will reach “**Differential Sync**”

Protection Status

Logged in as 'admin@10.0.1.141' - Logout

Server Time: Jan-9-2009 18:37:11

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
					On CX	On Target					
Pool:SR-50-Pool, Vm:RHEL5_1 Servers: SR-CITRIX50-105,SR-CITRIX50-105,SR-CITRIX50-106-->XEN-IMITS001	e9eb2e97-4b03-476b-9934-b7b0a6337f2f(RHEL5_1)-->/dev/mapper/VG_XenStorage--0454c82e--5991--8093--6c91--dfbc899bc40-LV--73f07999--ba97--4a66--a71d--2356246dd1c4	Volume /dev/mapper/VG_XenStorage--0454c82e--5991--8093--6c91--dfbc899bc40-LV--73f07999--ba97--4a66--a71d--2356246dd1c4	0	0	0	0	N/A	0.13 minutes	Differential Sync	NO	<a href="#">+</a>

Figure 107

## 19.2 Consistency tags

Access the source guest machine and issue consistency tags. These tags later act as markers to which you may perform a recovery. In this example consistency tag is issued manually, you may however choose to schedule this through a cron job.

**Step 1.** To issue a consistency tag, you will need to download the appropriate vacp script. You can download this off the CX UI by navigating to “**System-> Agent installers**”



Figure 108

Ensure that the script is given execute privilege before you issue the following command

```
./vacp32 -v <volume group> -remote -serverdevice < source volume > -t  
<Name of the tag> -serverip <Citrix XenServer on which the guest is active> -  
serverport 20003
```

```
[root@citrixguest1 home]# ./vacp32 -v /dev/mapper/VolGroup00-LogVol100 -remote -serverdevice /dev/VG_XenStorage-02a37  
2cc499c3fbfc/LV-e9eb2e97-4b03-476b-9934-b7b0a6337f2f -t MY_TAG -serverip 10.0.104.106 -serverport 20003  
Caught an exception with Local Configurator Settings  
Generating tag names ...  
Tag: FileSystem496819d0  
Tag: MY_TAG  
  
Sending Following Tag Request ...  
Flags = 3  
Num. Volumes = 1  
Volume: 1 Name: /dev/VG_XenStorage-02a37071-fb56-943d-b125-2cc499c3fbfc/LV-e9eb2e97-4b03-476b-9934-b7b0a6337f2f Leng  
Num. Tags = 2  
Tag: 1 Length:11  
Tag: 2 Length:23  
  
Starting device I/O suspension...
```

Figure 109

## 20 Failover

### 20.1 Rollback approach

To recover you will need to roll back the target volume back to a consistent point. Ensure that the source guest machines are shutdown before performing a rollback.

**Step 1.** Click on “**Recovery**” on the CX UI, select the replication pair to be rolled back and click on “**Rollback**”. You will be prompted for a confirmation, click on “**Ok**” to continue

**Volume Recovery : Recovery Snapshots**  
Logged in as 'admin' - [Logout](#)

**Recovery Snapshots** | **Scheduled Snapshots**

**Replication Pair Details**

	Server	Pri Volume	Remote Server	Volume	Replication Pool
<input checked="" type="checkbox"/>	Cluster : , Group : Red Hat Enterprise Linux 5.0 (1), Servers : CITRIX104A,CITRIXGUEST2	/dev/mapper/VG_XenStorage--3b2dcfb3--0327--2d78--64a6--7581d66554ec-LV--4ee9b508--05bf--4fa9--9383--0004f47f17ec	IMIT2S014	/dev/mapper/VG_XenStorage--de5c17d0--c099--8e7c--e898--e59ce300a85b-LV--642fc1b2--c6c5--4121--9fb7--c239110692b5	14

Figure 110

**Step 2.** The next screen appears, select the “**Using Application consistency & Event based**” option

**Pair Details**

Server	Primary Volume	Remote Server	Target Volume	Replication Pool
Cluster : , Group : Red Hat Enterprise Linux 5.0 (1), Servers : CITRIX104A,CITRIXGUEST2	/dev/mapper/VG_XenStorage--3b2dcfb3--0327--2d78--64a6--7581d66554ec-LV--4ee9b508--05bf--4fa9--9383--0004f47f17ec	IMIT2S014	/dev/mapper/VG_XenStorage--de5c17d0--c099--8e7c--e898--e59ce300a85b-LV--642fc1b2--c6c5--4121--9fb7--c239110692b5	14

**Recovery Options**

**Logs Available**

<b>From</b>	2008/11/21 11:38:54:677 (GMT)	<b>To</b>	2008/11/21 13:31:14:116 (GMT)
-------------	-------------------------------	-----------	-------------------------------

**Recovery Based On**

☐ Using Time

☒ Using Application consistency & Event based

Figure 111

**Step 3.** You should see the interface change to the search result as shown below. Select the desired consistency tag to which the target volume will be rolled back and click on “Save”

Search Result				
	Accuracy	Timestamp	Application	Tag Name
		2008/11/21 14:18:44:586	File System	FileSystem4926c349
		2008/11/21 14:18:44:586	User Defined	My_tag
<< < 1 > >>				
Recovery Points Accuracy:  - Exact  - Approximate  - Not guaranteed				
<div>Save Cancel</div>				

Figure 112

**Step 4.** The rollback will soon complete then proceed to the next step

Target Drive Rollback Status								
	Host	Rollback Drive	Status	Progress	Expected Recovery Point	Actual Recovery Point	Recovery based on	Info Message
	IMIT2S014	/dev/mapper/VG_XenStorage--de5c17d0--c099--8e7c--e898--e59ce300a85b-LV--642fc1b2--c6c5--4121--9fb7--c239110692b5	Complete	100%	2008/11/21 14:18:44:586	-	Tag Based Tag My_tag Accuracy	-
<div>Release Drive</div>								
Recovery Points Accuracy:  - Exact  - Approximate  - Not guaranteed								

Figure 113

**Step 5.** Start the guest machines on the target Citrix XenServer pool, they should come up normally without requiring any configuration changes

## 20.2 Snapshot Approach

Rather than rolling the target volume back and stopping the replication pair, you may choose the snapshot approach of the target volume there by keeping the replication pair intact.

### 20.2.1 Prepare for snapshot

**Step 1.** In this approach we will first create a virtual disk (SnapShot-Disk) in the target SR

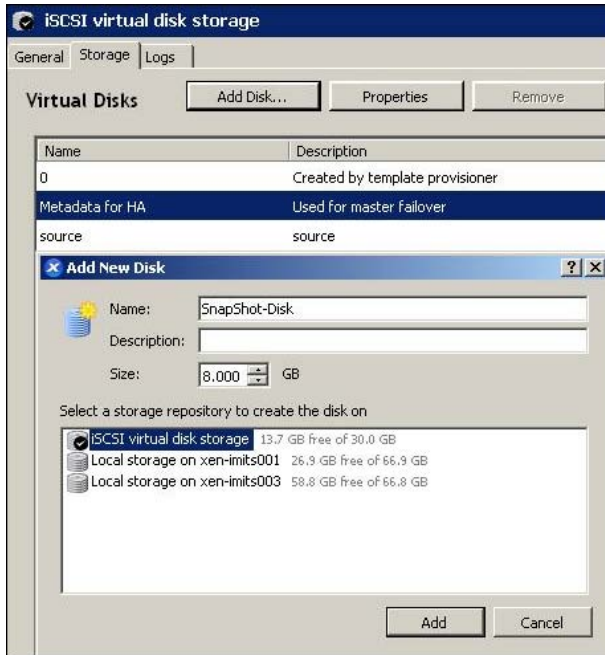


Figure 114

**Step 2.** Make this virtual disk available to the CX by changing its status using the command "lvchange -ay <DEVICE\_PATH>".

```
[root@xen-imits001 ~]# lvchange -a y /dev/VG_XenStorage-0e54c82e-5991-8093-6c91-dfebcb899bc40/LV-73f07999-ba97-4a66-a71d-2356246dd1c4
```

## 20.2.2 Perform snapshot

**Step 1.** Click on “Recovery” on the CX UI, select the replication pair to be rolled back and click on “Recover” and click on “Ok” to continue

**Volume Recovery : Recovery Snapshots**  
 Logged in as 'admin' - [Logout](#)

[Recovery Snapshots](#) | [Scheduled Snapshots](#)

**Replication Pair Details**

	Server	Pri Volume	Remote Server	Volume	Replication Pool
<input checked="" type="checkbox"/>	Cluster : , Group : Red Hat Enterprise Linux 5.0 (1), Servers : CITRIX104A,CITRIXGUEST2	/dev/mapper/VG_XenStorage--3b2dcfb3--0327--2d78--64a6--7581d66554ec-LV--4ee9b508--05bf--4fa9--9383--0004f47f17ec	IMIT2S014	/dev/mapper/VG_XenStorage--de5c17d0--c099--8e7c--e898--e59ce300a85b-LV--642fc1b2--c6c5--4121--9fb7--c239110692b5	14

Figure 115

**Step 2.** The next screen appears, select the “Using Application consistency & Event based” option

**Pair Details**

Server	Primary Volume	Remote Server	Target Volume	Replication Pool
Cluster : , Group : Red Hat Enterprise Linux 5.0 (1), Servers : CITRIX104A,CITRIXGUEST2	/dev/mapper/VG_XenStorage--3b2dcfb3--0327--2d78--64a6--7581d66554ec-LV--4ee9b508--05bf--4fa9--9383--0004f47f17ec	IMIT2S014	/dev/mapper/VG_XenStorage--de5c17d0--c099--8e7c--e898--e59ce300a85b-LV--642fc1b2--c6c5--4121--9fb7--c239110692b5	14

**Recovery Options**

Logs Available	From 2008/11/21 11:38:54:677 (GMT)	To 2008/11/21 13:31:14:116 (GMT)
Recovery Based On		
<input type="radio"/> Using Time <input checked="" type="radio"/> Using Application consistency & Event based		

Figure 116

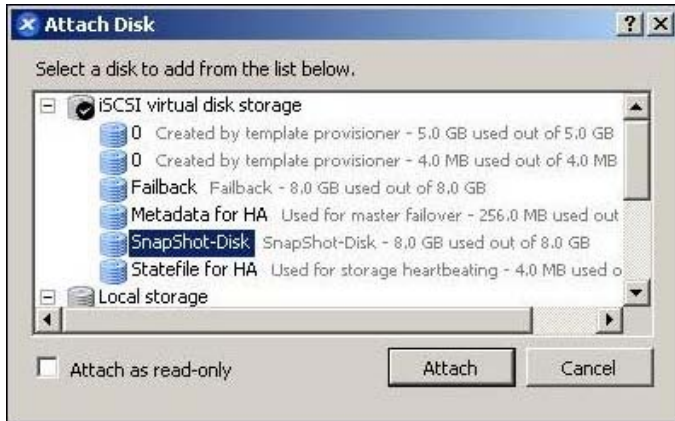
**Step 3.** Use Physical and then select the Drive corresponding to the new SnapShot-Disk VDI created for this purpose. Now take a snapshot of the target, onto this disk.

Recovery Pair Status									
	Host	Host Drive	Recovery Drive	Drive Type	Status	Progress	Expected Recovery Point	Actual Recovery Point	Recovery based on
<input checked="" type="radio"/>	SR-CITRIX50-107	/dev/mapper/VG_XenStorage--dddb190e--e4c0--165c--5d81--b08c1193094f-LV--7e2bb5c7--a762--49ee--a922--7fa8147fcb3d	/dev/mapper/VG_XenStorage--dddb190e--e4c0--165c--5d81--b08c1193094f-LV--3024f502--2c8f--449d--9b77--257869ddf6e4 (/mnt/snap)	WAN Drive	Snapshot Inprogress	1%	2009/1/11 10:36:53:332	-	Tag Based Tag TAG_New Accuracy

Figure 117

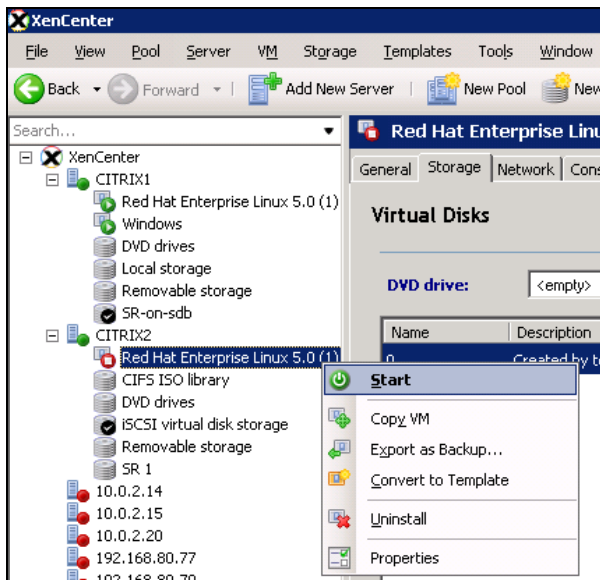
**Step 4.** Create a new VM corresponding to that of the source guest machine in Target system.  
Now shutdown this VM.

**Step 5.** Remove the original disk from this VM and attach the snapshot disk to this VM.



**Figure 118**

**Step 6.** Start the VM, it should boot up normally.



**Figure 119**



## 21 Failback

### 21.1 Rollback approach

To perform a failback in rollback approach, set a reverse replication from the target Pool to the source Pool. Now perform a reverse replication from the Target Drive to the source VDI (newly created).

Failback is performed in four steps

- Reverse replication: A reverse replication is set to update the production volume with all the changes occurred during its outage
- Consistency tag: Consistency tags is issued to which a rollback will be performed
- Rollback: The target volume is rolled back to a consistency tag
- Start guest machine: The guest machine should boot up with the rolled back volume.



Figure 79

#### Reverse replication

**Step 1.** Set a reverse replication of the Target VM to the newly created VDI in the source SR with media retention.

#### Consistency tag

**Step 2.** Once the replication pair reaches “**Differential Sync**”, access the guest machine then navigate to the image agent installation path to issue a consistency tag. The section [11.2 Consistency](#) can be referred.

#### Rollback

**Step 3.** Rollback the target volume based on the above issued consistency tag. Refer to the section [Rollback approach](#) on page 30 to perform a rollback.

#### Start the guest machine

**Step 4.** Once the rollback is complete, access the XenCenter interface to start the guest machines

## 21.2 Snapshot approach

To perform a failback from snapshot approach, we need to create **two** new VDI in Source SR and activate the VDI in one of the Host system in Source Pool. One VDI will be used to set up a replication pair and the other will be used to take snapshot of the replication pair based on some consistency tag. Now perform a reverse replication from the Target snapshot Drive to the source VDI (newly created).

Failback is performed in four steps

- Reverse replication: A reverse replication is set to update the production volume with all the changes occurred during its outage
- Consistency tag: Consistency tags is issued to which a rollback will be performed
- Snapshot: Take one snapshot of the replication pair based on a consistency tag
- Attach the snapshot drive : Now attach this snapshot drive to a newly created VM.
- Start guest machine: The guest machine should boot up with the rolled back volume.



Figure 79

### Reverse replication

**Step 1.** Set a reverse replication of the Target VM to the newly created VDI in the source SR with media retention.

### Consistency tag

**Step 2.** Once the replication pair reaches “**Differential Sync**”, access the guest machine then navigate to the image agent installation path to issue a consistency tag. The section [11.2 Consistency](#) can be referred.

### Snapshot

**Step 3.** Use the second VDI to take a snapshot of the target drive once the pair is in differential sync based on the above issued consistency tag. Refer to the section [Snapshot approach](#) on page 33 to perform a rollback.

### Start the guest machine

**Step 4.** Once the snapshot is complete, create a new VM -> shutdown the VM -> detach the boot disk and attach this snapshot disk. Access the XenCenter interface to start the guest machines

## **Part 5: Protecting XenServer Pool: Master target guest approach**

This part explains protecting a XenServer resource pool by replicating source pool storage to target pool storage attached to the master guest machine on the target XenServer resource pool

## 22 Introduction

This section describes protecting the source XenServer pool to a master guest machine on the target XenServer pool.

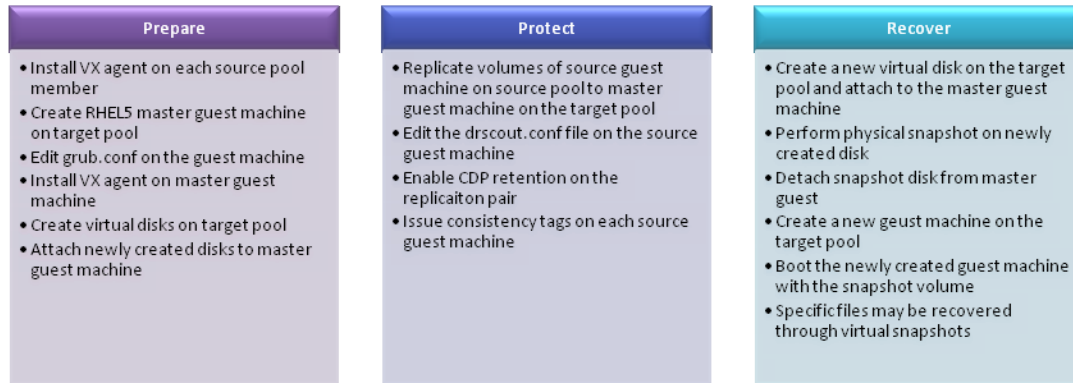


Figure 120

### Prepare

There are a total of six steps to be performed in this stage as shown in the picture above.

### Protect

This section explains to replicate the virtual disks of VMs on source pool to newly created virtual disks attached to master guest machine and issuing consistency tags at regular intervals. Issuing consistency tags may be automated by using a cron job or any scheduler

### Recover

This section describes steps involved in performing a physical snapshot and booting another guest machine over the snapshot disk.

## 23 Prepare

**Step 1.** Install the VX agent on each of the source pool members

**Step 2.** Create RHEL-5 master guest machine on target pool

**Step 3.** Access the master guest machine's command prompt and open the file  
"/boot/grub/menu" to set the "default" value to 1. This loads the regular kernel rather than  
the XenServer's kernel.

```
# grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to this file
# NOTICE: You have a /boot partition. This means that
#          all kernel and initrd paths are relative to /boot/, eg.
#          root (hd0,0)
#          kernel /vmlinuz-version ro root=/dev/VolGroup00/LogVol100
#          initrd /initrd-version.img
#boot=/dev/xvda
default=1
timeout=5
splashimage=(hd0,0)/grub/splash.xpm.gz
hiddenmenu
title Red Hat Enterprise Linux Server (2.6.18-92.1.10.el5.xs5.0.0.39xen)
```

Figure 121

**Step 4.** Install the VX agent on the master guest machine

**Step 5.** Create a new virtual disk & attach it to master guest machine through the XenCenter  
interface

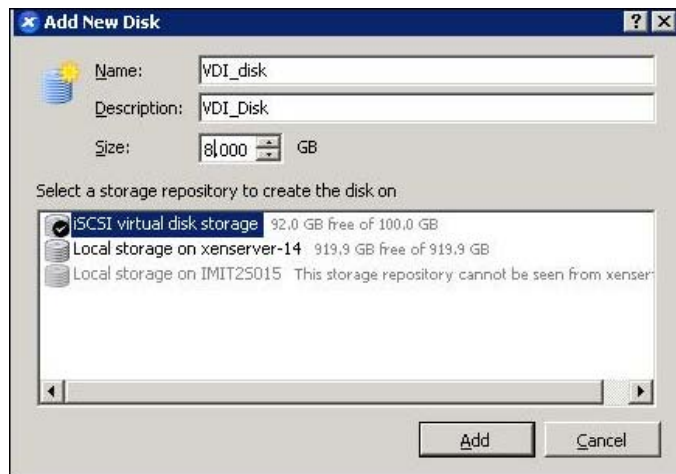


Figure 122

# 24 Protect

## 24.1 Set replication pairs

**Step 1.** Access the CX UI and click on “**Volume Protection**”. Expand “**Xen Pools**” to find the list of pools available. Then expand the source pool to select the source guest machine and click on “**Start Replication**”

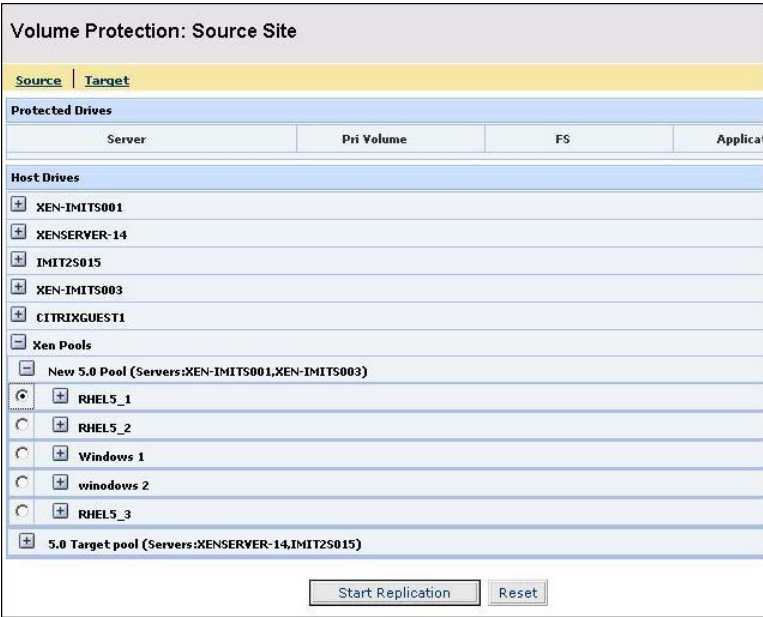


Figure 123

**Step 2.** Select the “**Unconfigured pool Drive**” and click on “**Next**”



Figure 124

**Step 3.** The next screen appears, expand the master guest machine and select the newly created/attached virtual disk and scroll down to set the “**Replication options**”

Pool: New 5.0 Pool  
Vm: RHEL5\_1

Drive: 36863ee4-7d6d-4932-ae92-b72eca861d4f(source)  
Capacity: 8589934592

Select a target WAN volume

	WAN Server	Volume	Capacity (Bytes)	Free Space (B)
<input type="checkbox"/>	XEN-IMITS001			
<input type="checkbox"/>	XENSERVR-14			
<input type="checkbox"/>	IMIT25015			
<input type="checkbox"/>	XEN-IMITS003			
<input checked="" type="checkbox"/>	CITRIXGUEST1			
<input type="radio"/>	CITRIXGUEST1	/dev/svda	8589934592	
<input checked="" type="radio"/>	CITRIXGUEST1	/dev/svdb	8589934592	
<input type="radio"/>	CITRIXGUEST1	/dev/svdd	70090752	
<input type="radio"/>	InMageProfiler	P	81920000	

**Figure 125**

**Step 4.** Select the desired Process Server and check the “**Enable CDP Retention option**” click on “**Submit**” to continue.

**Process Server**

Select Process Server  
IMITS141(10.0.1.141)

Number of Pair Configured  
0

**Replication Options**

☐ Secure transport from Source to InMage CX

☐ Secure transport from InMage CX to destination

Sync options: Fast

Use compression: CX Based Compression  
(Overrides existing 1-N replication pairs)

Add to volume consistency group: New Volume Group

☐ Use Process Server NAT IP address for Source

☐ Use Process Server NAT IP address for Target

**CDP Retention**

☒ Enable CDP Retention option

**Automatic Resync Options**

☐ Start between hours 18 : 00 and 6 : 00 after waiting 30 minutes. (All times are local to CX)

Submit Cancel Reset

**Figure 126**

**Step 5.** Fill up the required “Retention Options” and click “Submit” button.

**Volume Protection: Retention Options**  
 Logged in as 'admin' - [Logout](#)

Pair Details			
Server	Pri Volume	Remote Server	Volume
XEN-IMITS001,XEN-IMITS003	/dev/mapper/VG_XenStorage--0e54c82e--5991--8093--6c91--dfbc899bc40-LV--36863ee4--7d6d--4932--ae92--b72eca861d4f	CITRIXGUEST1	/dev/xvdb

**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	512 MB (Cannot be less than 256 MB)		
Retain changes upto the (time)	<div>(Days)</div> <div>(hrs.)</div>		
On insufficient disk space	<input checked="" type="radio"/> Purge older retention logs <input type="radio"/> Pause differentials		
Log data directory	/mnt/ret1 (Eg:- K:\log_data) /mnt drive is suggested for storing rollback log files.		

**Configure Threshold for Alerts**

Alert when disk space utilization reaches	80 %
---	------

**Figure 127**

**Step 6.** The final screen appears, select the “Configured Pool Drive” and click on “Finish” to start the replication pair.

**Volume Replication: Pool Setup**  
 Pool: New 5.0 Pool  
 Vm: RHEL5\_1

Configured Pool Drives				
	Primary Server	Primary Volume	Remote Server	Remote Volume
	XEN-IMITS001,XEN-IMITS003	/dev/mapper/VG_XenStorage--0e54c82e--5991--8093--6c91--dfbc899bc40-LV--36863ee4--7d6d--4932--ae92--b72eca861d4f	CITRIXGUEST1	/dev/xvdb

**Figure 128**

**Step 7.** The replication pair starts with Resyncing Step 1 then moves to Resyncing step 2 and finally reaches Differential Sync, indicating that the initial copy is made on the target volume

Protection Status										
Logged in as 'admin@10.0.1.141' - <a href="#">Logout</a> Server Time: Jan-16-2009 11:34:14										
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
					On CX	On Target				
Pool:New 5.0 Pool, Vm:RHEL5_1 Servers: XEN-IMITS001,XEN-IMITS003->CITRIXGUEST1	36863ee4-7d6d-4932-ae92-b72eca861d4f (source)-> /dev/xvdb	Volume /dev/xvdb	0	0	0	0	N/A	0.52 minutes	Differential Sync	NO

**Figure 129**





## 24.2 Issue consistency tags

Once the replication pair is in “**Differential Sync**”, access the source guest machine’s command prompt and issue the consistency tag through the vacp utility. The vacp utility may be downloaded from the CX UI under “**System -> Agent installers**”

```
[root@citrixguest1 home]# ./vacp32 -v /dev/mapper/VolGroup00-LogVol100 -remote -serverdevice /dev/VG_XenStorage-0e54c82e-5991-8093-6c91-dfebcb899bc40/LV-36863ee4-7d6d-4932-ae92-b72eca861d4f -t My tag -serverip 10.0.1.1
Generating tag names ...
Tag: FileSystem49702724
Tag: My_tag

Sending Following Tag Request ...
Flags = 3
Num. Volumes = 1
Volume: 1 Name: /dev/VG_XenStorage-0e54c82e-5991-8093-6c91-dfebcb899bc40/LV-36863ee4-7d6d-4932-ae92-b72eca861d4f Length:95
Num. Tags = 2
Tag: 1 Length:11
Tag: 2 Length:23
Connecting to Server.

ENTERED: ConnToVapServer
Connected to 10.0.1.1 at port 20003
EXITED: ConnToVapServer
Elapsed time for Establishing connection: 9668.000000

Starting device I/O suspension...
Sending tags to the remote server ...
Bytes passed to RemoteServer = 143

Starting device I/O resumption...
Successfully sent tags to the Remote Server ...
[root@citrixguest1 home]#
```

Figure 130

## 25 Recover

### 25.1 Add a disk to contain the snapshot

Access the XenCenter interface to create an extra disk on target pool & attach to the master guest machine to hold the snapshot as shown in the picture below.

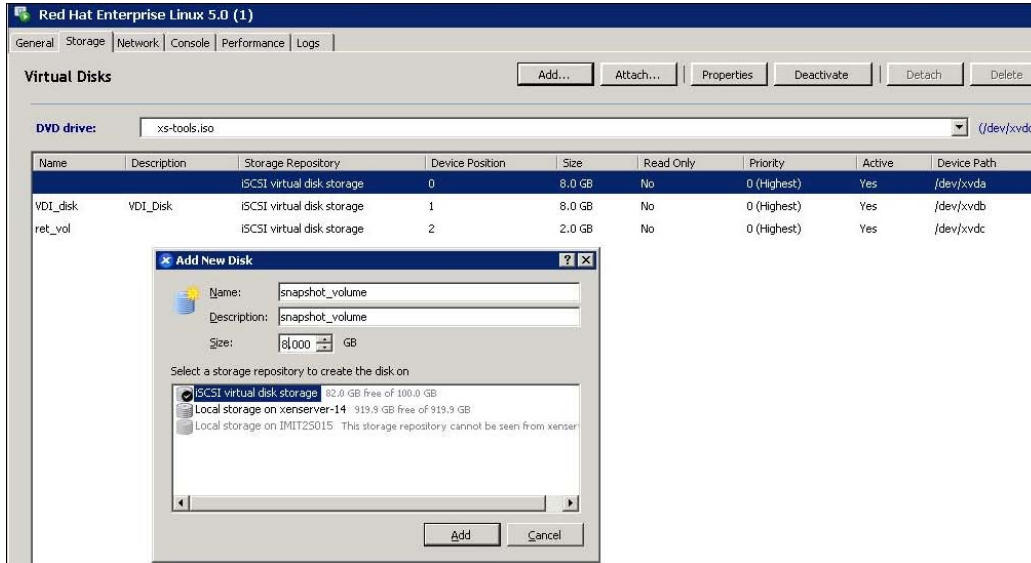


Figure 131

## 25.2 Create a Snapshot

**Step 1.** Access the CX UI and click on “**Recovery**”, then select the replication pair and click on “**Recover**”

**Volume Recovery : Recovery Snapshots**

[Recovery Snapshots](#) | [Scheduled Snapshots](#)

**Replication Pair Details**

	Server	Pri Volume	Remote Server	Volume	Replication Pool
<input checked="" type="checkbox"/>	Pool : New 5.0 Pool, Vm : RHEL5_1, Servers : XEN-IMITS001,XEN-IMITS003	/dev/mapper/VG_XenStorage--0e54c82e--5991--8093--6c91--dfbc899bc40-LV--36863ee4--7d6d--4932--ae92--b72eca861d4f36863ee4-7d6d-4932-ae92-b72eca861d4f(source)	CITRIXGUEST1	/dev/xvdb	3

Figure 132

**Step 2.** Select the “**Using Application consistency & Event based**” option

**Volume Recovery: Recovery SnapShot Options**

**Pair Details**

Server	Primary Volume	Remote Server	Target Volume	Replication Pool
Pool: New 5.0 Pool, Vm: RHEL5_1, Servers: XEN-IMITS001,XEN-IMITS003	36863ee4-7d6d-4932-ae92-b72eca861d4f (source)	CITRIXGUEST1	/dev/xvdb	3

**Recovery Options**

Logs Available	From 2009/1/16 5:39:21:212 (GMT)	To 2009/1/16 6:27:51:272 (GMT)
Recovery Based On		
<input type="radio"/> Using Time <input checked="" type="radio"/> Using Application consistency & Event based		

Figure 133

**Step 3.** The “Search Result” appears; select the desired consistency tag, then select “Drive Type” as “Physical”. Select the newly added disk to hold the virtual snapshot, enter the mount point and click on “Save”.

Search Result				
	Accuracy	Timestamp	Application	Tag Name
		2009/1/16 6:25:43:412	File System	FileSystem49702724
		2009/1/16 6:25:43:412	User Defined	My_tag

<< < 1 > >>

Recovery Points Accuracy: - Exact - Approximate - Not guaranteed

Drive Type	
<input checked="" type="radio"/> Physical	<input type="radio"/> Virtual

Physical Drives					
	Host	Drive	Capacity	Filesystem	Mount Point
<input checked="" type="checkbox"/>	CITRIXGUEST1	/dev/xvde	8589934592		/mnt/snapshot
<input type="checkbox"/>	CITRIXGUEST1	/dev/xvda	8589934592		

Figure 134



**Notes:**

You may recover specific files by taking a virtual snapshot. You will need to choose the “Drive Type” as “Virtual”.

After the virtual snapshot is ready, access the master guest’s command prompt to setup a loop device to the virtual snapshot device. This loop device may be mounted to recover individual files.

The command to setup a loop device is

`losetup /dev/loop<loop device number> /dev/vs/cx<vsnap device number>`

**Step 4.** You may observe the snapshot status through the “Recovery” screen

Recovery Pair Status												
	Host	Host Drive	Recovery Drive	Drive Type	Status	Progress	Expected Recovery Point	Actual Recovery Point	Recovery based on	Info Message	Export Message	Export
	CITRIXGUEST1	/dev/xvdb	/dev/xvde	WAN Drive	Complete	100%	2009/1/16 11:47:48:592	-	Tag Based Tag My_tag Accuracy			

Figure 135

## 25.3 Detach snapshot disk from master guest machine

**Step 1.** Access the XenServer interface and “Deactivate” the snapshot volume as shown in the picture below.

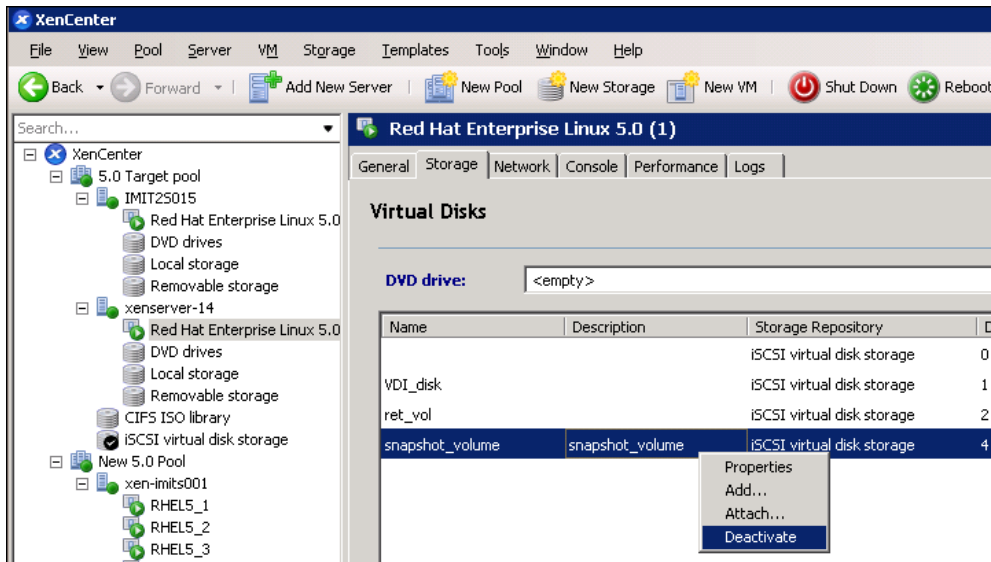


Figure 136

**Step 2.** Then “Detach” the snapshot volume from the master guest machine

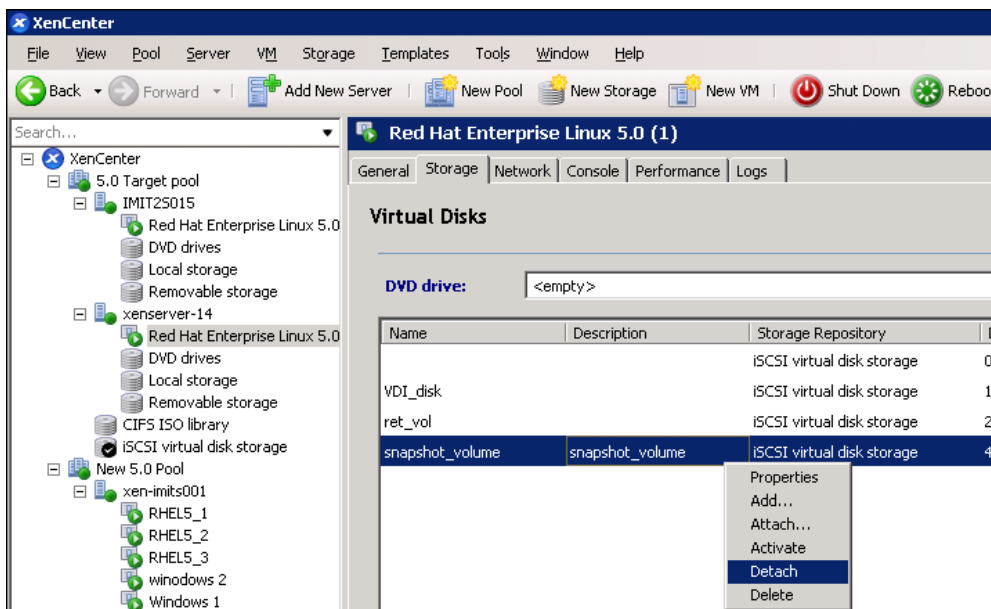


Figure 137

**Step 3.** You will be prompted for a confirmation, click on “Yes” to continue.

## 25.4 Attach the Snapshot disk to another Guest

**Step 1.** Create another guest machine

**Step 2.** Attach the snapshot disk as shown in the picture.

Note: VM should be started at least once before attaching the boot volume to the VM

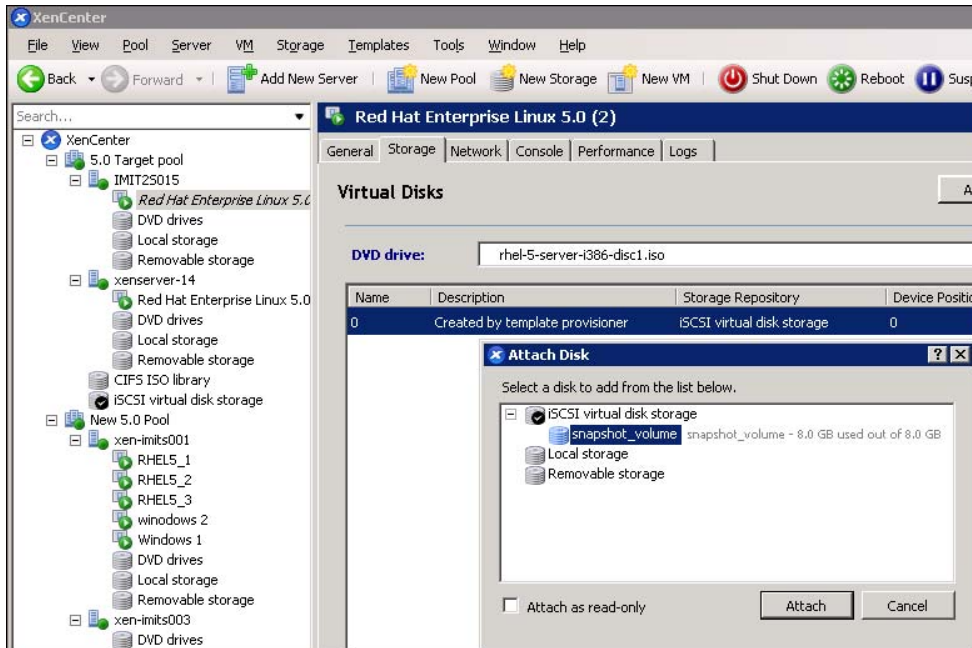


Figure 138

**Step 3.** Detach the earlier disk, you will be asked for confirmation, click on “Yes” to continue

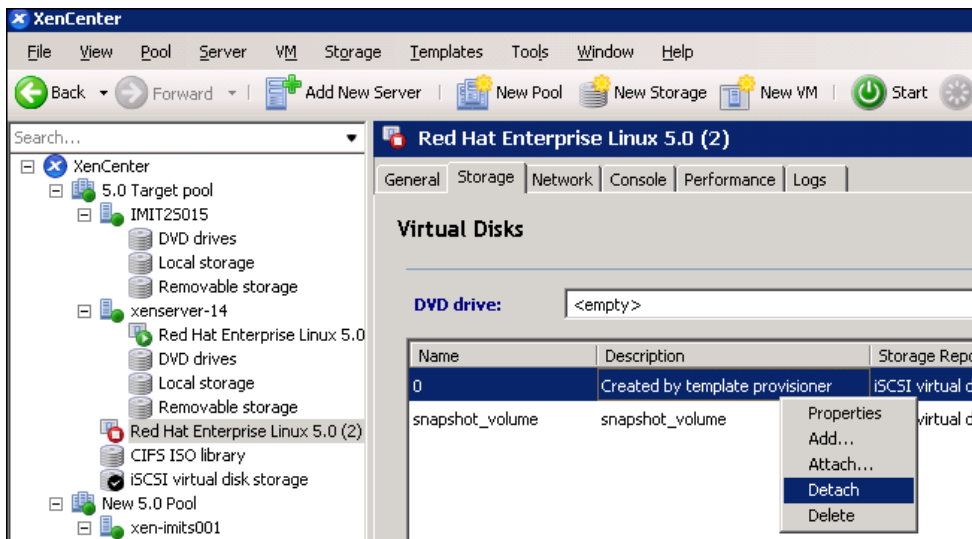


Figure 139

**Step 4.** Start the guest machine, it should boot up normally.

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