

SANRAD Whitepaper: Configuring Red Hat Linux V4 with SANRAD iSCSI V-Switch

APP-024-01

Important Notice

The configurations described or tested in this application note are not the only available solution. This application note is not intended nor may it be construed as an endorsement of any product(s) tested.

This application note provides no warranty of any kind. SANRAD limited warranties for SANRAD products are stated in separate documentation accompanying each product. No damages or remedy of any kind shall be recoverable by any party for any claim or loss in any way arising or alleged to arise from or as a result of this application note, whether considered alone or in addition to any other claim.

Copyright SANRAD 2007

All rights reserved. The copyright and all intellectual property rights in this article belong to SANRAD. It is strictly forbidden to copy, duplicate or otherwise use this article or any part thereof in any way shape or form without the prior written consent of SANRAD.

Table of Contents

Overview.....	1
Minimum Requirements.....	1
Configuring the V-Switch	1
Configuring the iSCSI Portal.....	1
Creating iSCSI Targets and Exposing Volumes	4
Creating Stand-Alone Targets.....	4
Exposing Volumes on iSCSI Targets	6
Configuring an iSCSI Volume on Red Hat Linux V4	7
Working with the iSCSI Volume	8

Figures

FIGURE 1. PROPERTIES (V-SWITCH MENU)	1
FIGURE 2. V-SWITCH PROPERTIES.....	2
FIGURE 3. ADD NETWORK PORT IP PARAMETERS	2
FIGURE 4. PROPERTIES (V-SWITCH MENU)	3
FIGURE 5. ADDING PORTAL	3
FIGURE 6. CREATE NEW TARGET.....	4
FIGURE 7. NEW TARGET ALIAS AND NAME.....	5
FIGURE 8. NEW TARGET IN NAVIGATION PANE	5
FIGURE 9. CREATE VOLUME	6
FIGURE 10. EXPOSE VOLUME	6

Overview

This paper describes how to configure Red Hat Linux Version 4 to work with iSCSI volumes using SANRAD's V-Switches.

Configuring Red Hat Linux V4 to work with iSCSI volumes requires:

1. Configuring the V-Switch.
 - Creating volumes on the V-Switch.
 - Exposing the volumes on iSCSI targets.
2. Configuring Red Hat V4 software initiator to see the iSCSI volumes exposed by V-Switch.

Minimum Requirements

- Red Hat Linux OS V4 update 4 or higher
- Red Hat iSCSI initiator V4.0.3.0-4 or higher (download from the Red Hat Web site <http://www.redhat.com>)
- V-Switch Firmware 3.1.36.0 or higher

Configuring the V-Switch

To enable a host to communicate with the V-Switch, an iSCSI portal with an IP address must be configured on at least one of the V-Switch ETH ports.

Configuring the iSCSI Portal

To add IP addresses to the ETH Port:

1. In the Navigation pane, right click on the V-Switch on which you want to add a network port IP address and select **Properties...**

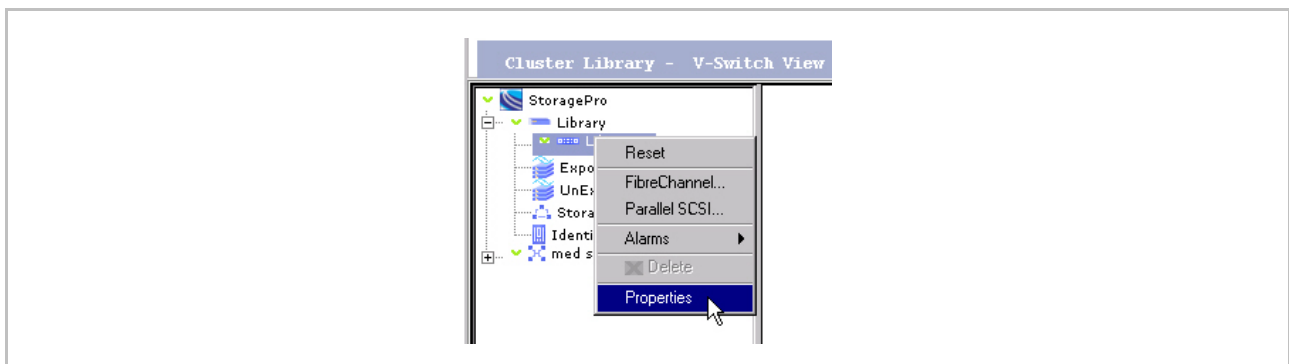


Figure 1. Properties (V-Switch Menu)

The V-Switch Properties dialog box opens.

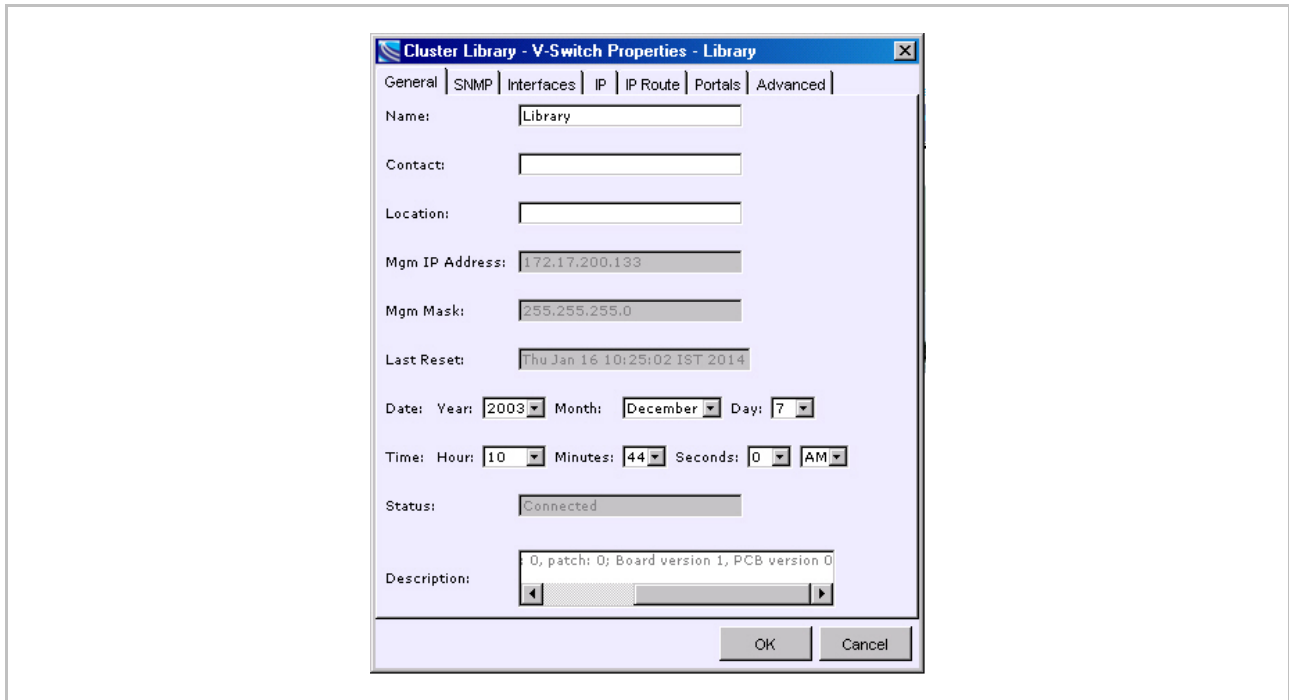


Figure 2. V-Switch Properties

2. Toggle to the IP tab.

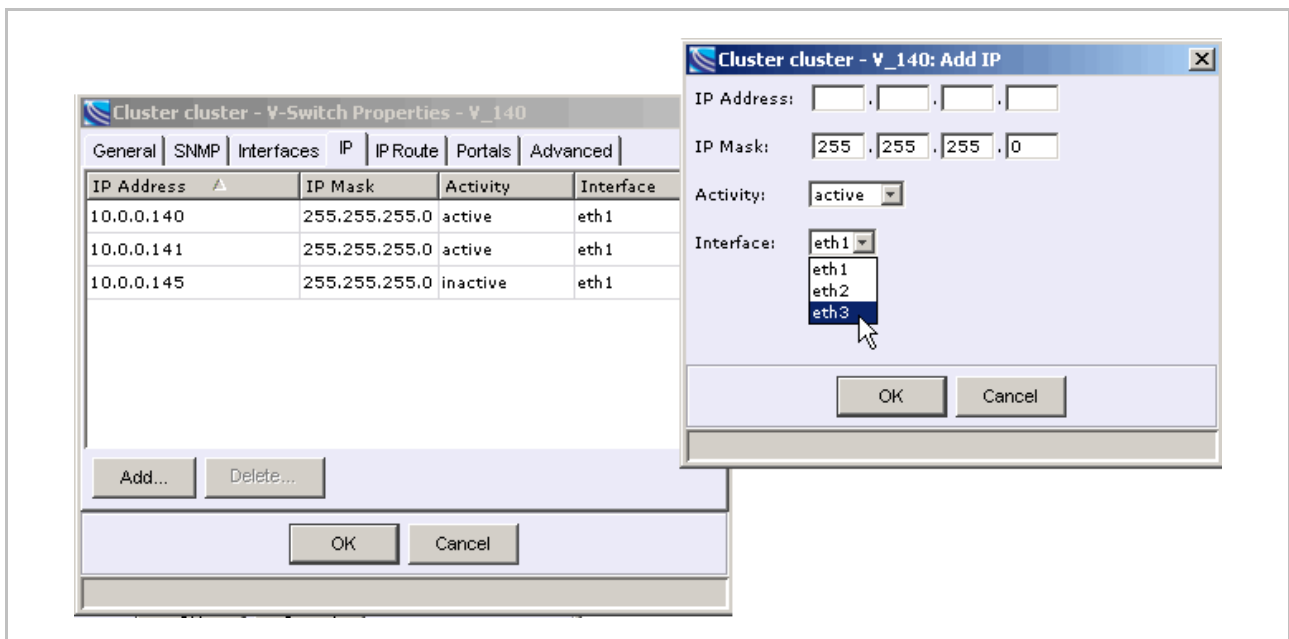


Figure 3. Add Network Port IP Parameters

3. Click **Add**.
The Add IP dialog box opens.

4. Enter the IP values and click **OK**.

The new IP address is listed in the IP tab.

To add an iSCSI portal:

1. In the Navigation pane, right click on the V-Switch on which you want to add an iSCSI portal and select **Properties**.

The V-Switch Properties dialog box opens (Figure 2).

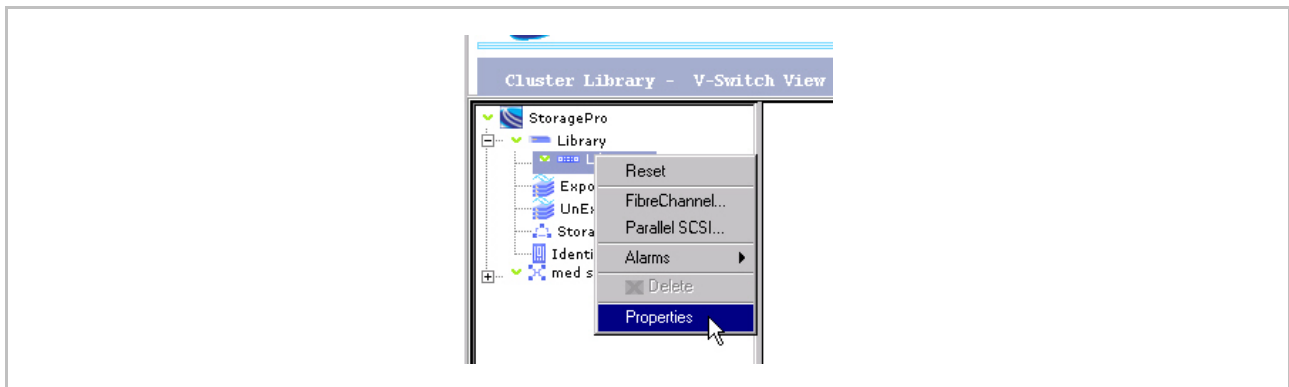


Figure 4. Properties (V-Switch Menu)

2. Toggle to the Portals tab (Figure 5).

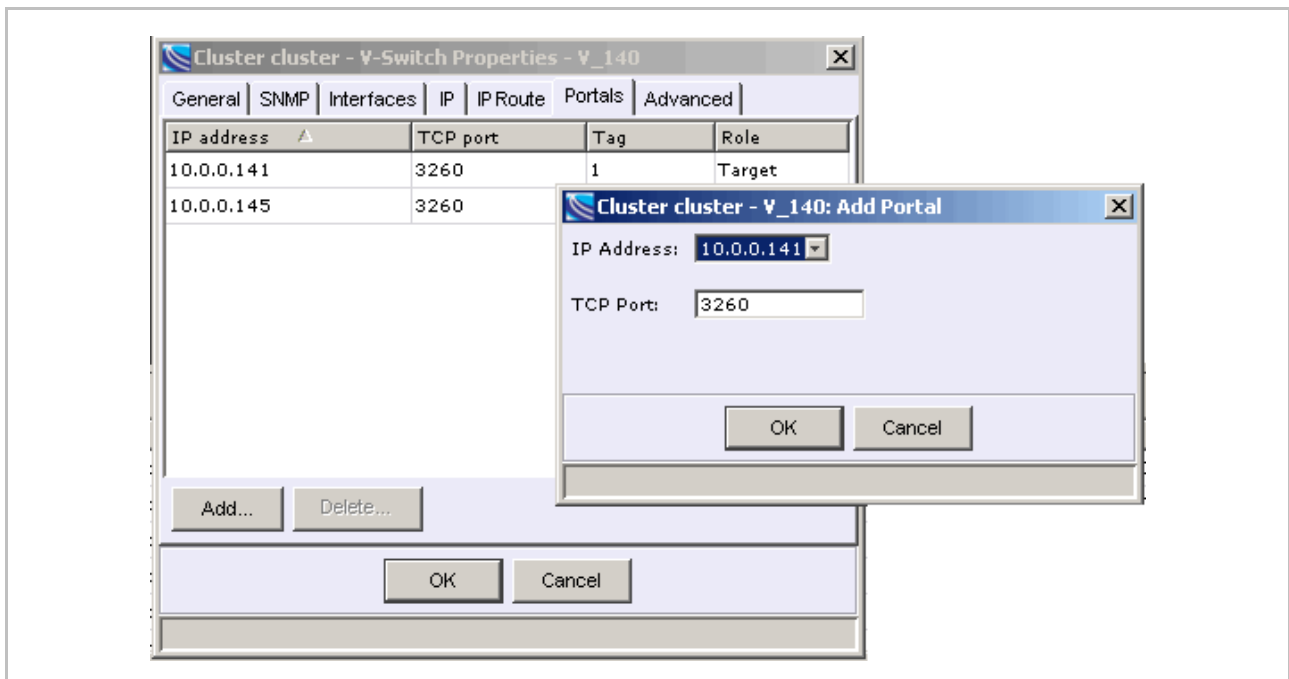


Figure 5. Adding Portal

3. Click **Add**.

The Add Portal dialog box opens.

4. Select the IP address from the drop-down menu of existing IP address and enter the port number.
5. Click **OK**.
6. If you are working in a cluster, a second Add Portal dialog box opens for the second V-Switch. The IP address and port numbers are already listed and cannot be changed.

Creating iSCSI Targets and Exposing Volumes

With iSCSI, a volume can be exposed when an iSCSI initiator establishes a TCP connection with an iSCSI target via the iSCSI Portal.

There are two ways to expose a volume and create a target:

1. By first creating stand-alone targets and exposing volumes on these targets.
2. By exposing a volume and creating a target together at the same time (refer to the V-Switch User manual).

Creating Stand-Alone Targets

To create a new stand-alone target:

1. From the Navigation pane, right click the desired Cluster and select **New > Target...**

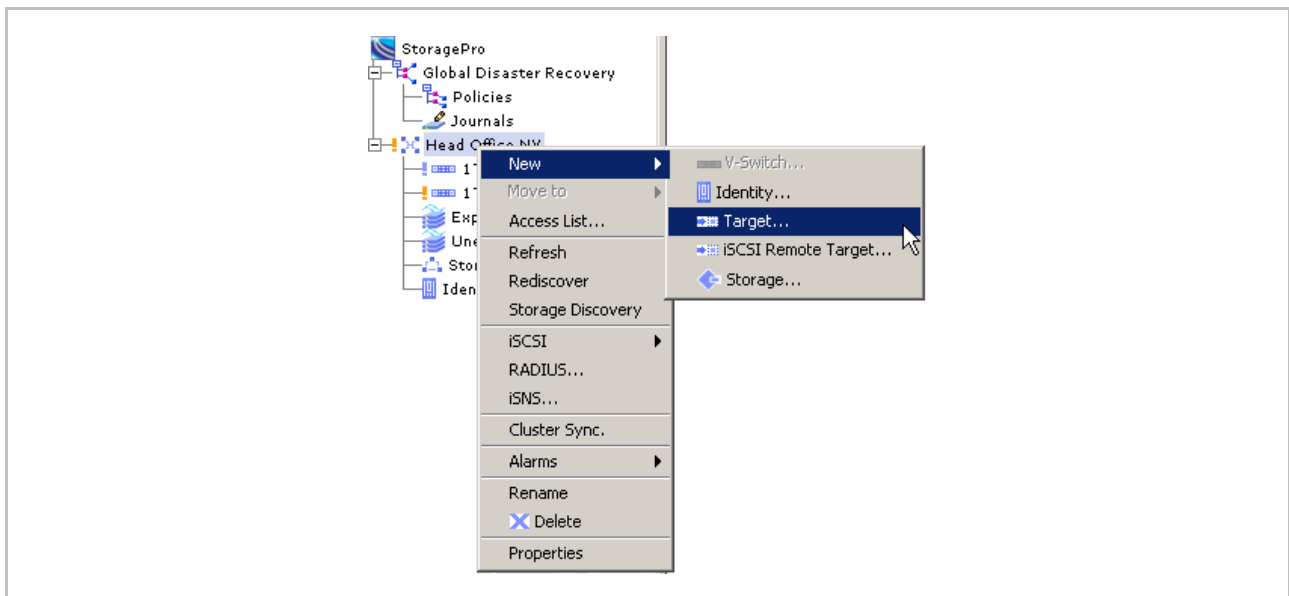


Figure 6. Create New Target

The New target dialog box appears.

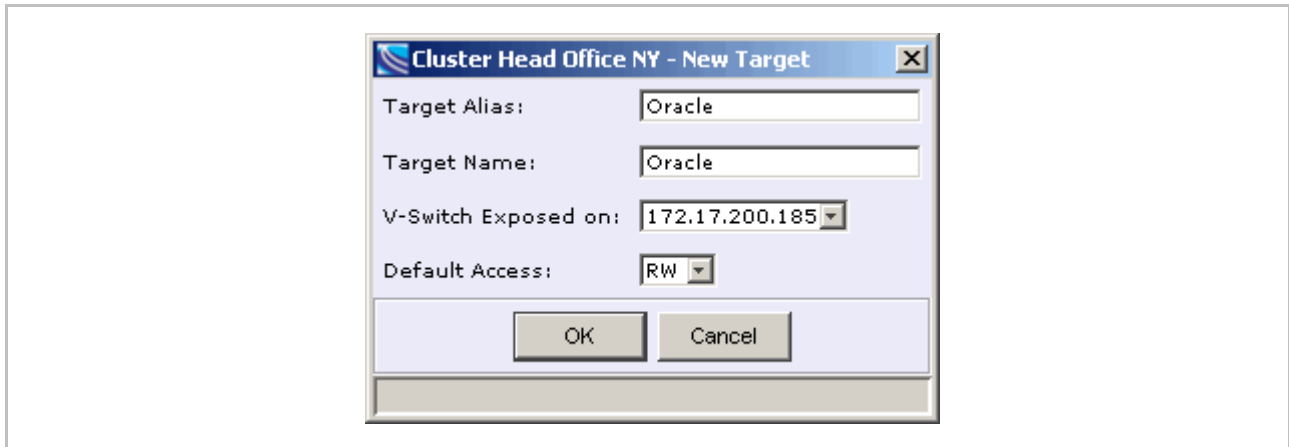


Figure 7. New Target Alias and Name

2. Enter the Target Alias and Target Name (target WWUI).
3. Select value for V-Switch Exposed on (the V-Switch on which to expose the target).
4. Select the Default Access rights for the target. Choose from Read/Write (RW), Read Only (RO) or Not Available (N/A). The default is R/W

Note:

- A target alias is an internal identifier and can be modified later.
- A target name is the WWUI of the target and for external use when connecting to an initiator and cannot be modified.
- A target name must be in lower case letters.
- A target alias and name can be the same.

5. Click **OK**.

The new target is listed under Exposed Volumes in the Navigation pane. The target is displayed by its alias. Move the mouse over the alias to display the target name and exposing V-Switch.

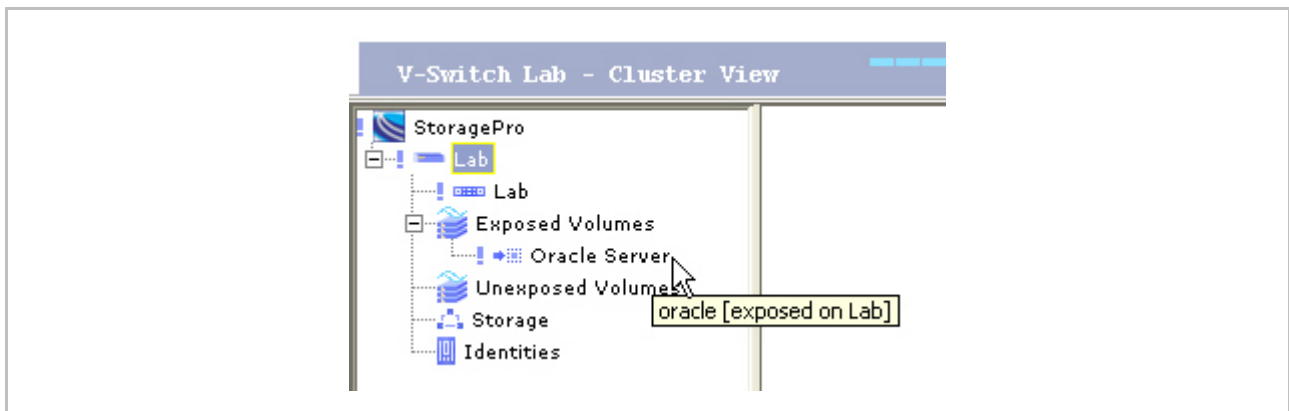


Figure 8. New Target in Navigation Pane

Exposing Volumes on iSCSI Targets

After creating a volume, you expose it on a V-Switch. To expose a volume, you must attach it to a target and assign an LU number.

To expose a volume on existing targets:

1. From the Create Volume window (Figure 9), select the volume to expose, and click Expose ➔)].

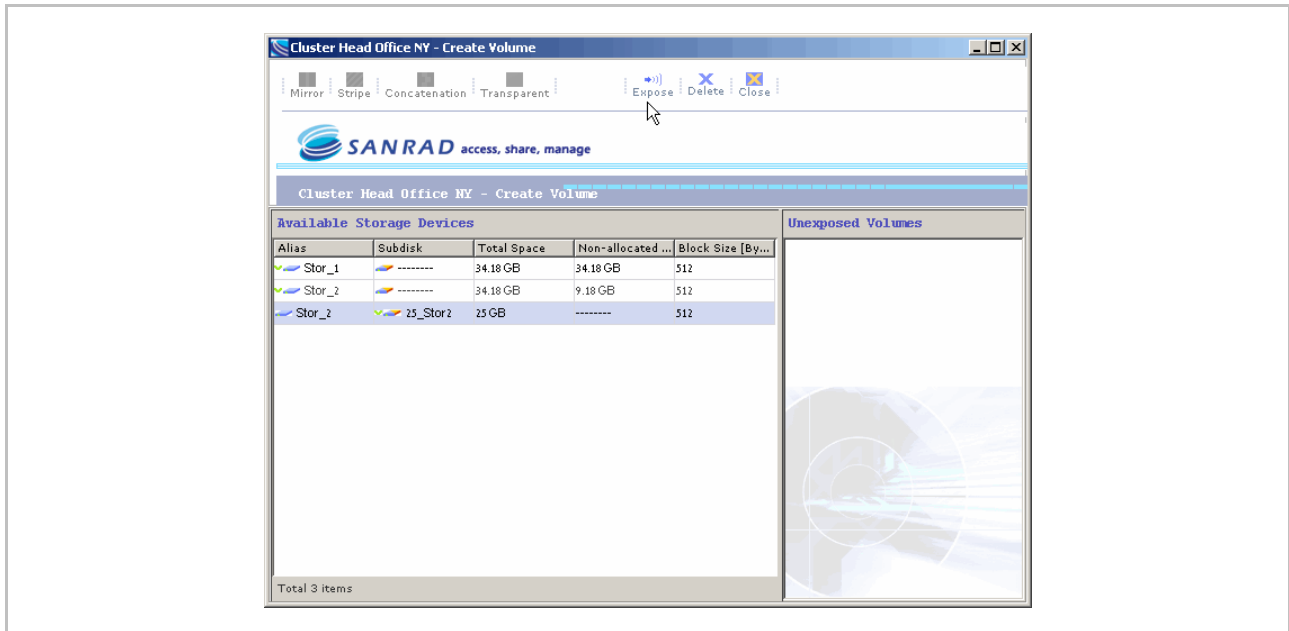


Figure 9. Create Volume

The Expose Volume dialog box opens.

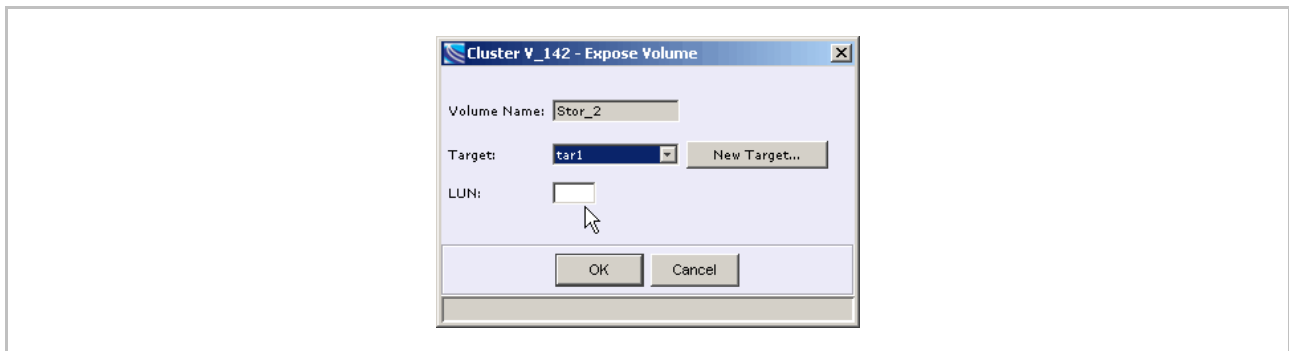


Figure 10. Expose Volume

2. Select an existing Target from the list or create a new target by clicking the New Target... button.
3. Assign a LUN for the target.
4. Click **OK**.

Note:

- A LUN number cannot be larger than 255.
- it is recommend to expose one LUN per one iSCSI Target to improve performance

Configuring an iSCSI Volume on Red Hat Linux V4

Once the V-switch has been properly set up and volumes have been exposed the following needs be done on the Red Hat Linux server in order for the iSCSI volumes to be used:

- Download the iSCSI initiator package
- Configure the iSCSI initiator to connect to the iSCSI volume
- Work with the iSCSI volume

To download the latest iSCSI initiator from Red Hat:

- Use the command: `UP2DATE ISCSI-INITIATOR-UTILS.`

To configure the iSCSI initiator to connect to the iSCSI volume:

1. Login as *root*.
2. Configure one of the NICs on the Red Hat Linux Server with the iSCSI subnet configuration parameters using the same subnet as the iSCSI Portal IP configured on the V-Switch.
3. From the Red Hat Linux server, verify connectivity by ping the iSCSI portal IP.
4. Using vi, open the file `/etc/iscsi.conf` and configure the following:
 - Uncomment "DiscoveryAddress" (located in the Discovery Address Category).
 - Modify the IP to that of the iSCSI portal IP.

These are the only required changes. All other configurations in the `/etc/iscsi.conf` are optional and should be changed only by experience users and only when absolutely necessary.

- Save and close the file `/etc/iscsi.conf`.
5. To start the iSCSI service/demon at system boot:

From the command line run:

```
service iscsi start
chkconfig iscsi --level 2345 on
```

6. To view the iSCSI Volumes:

From the command line run:

```
iscsi-ls
fdisk -l
```

Working with the iSCSI Volume

1. After completing the iSCSI initiator configuration you can perform all the regular procedures to use the iSCSI LUN as a disk except for the following:

You must use disk labels when working with iSCSI storage. Delays in network traffic may cause the LUNs to be discovered in a different order after the next system boot. The only way to guarantee that the correct partition is mounted at the proper mount point is to use disk labels for identification.

Edit the `/etc/fstab` file to enable the iSCSI LUNs to mount at boot time.

The following example shows `/etc/fstab` entries for two iSCSI LUNs:

```
#device  mount point FS  OptionsBackup  fsck
LABEL=data1 /mnt/data1 ext3  _netdev0      0
LABEL=data2 /mnt/data2 ext3  _netdev0      0
```

Note:

- The `_netdev` option is needed for mounting iSCSI storage.

2. Using the iSCSI LUN with LVM

The procedures for the iSCSI volume and LVM are the same as for other types of volumes. However, once the configurations of file system and the mount options has been completed, using `vi`, open `/etc/fstab` and modify the line that mounts the logical volume with parameter `_NETDEV` instead of `DEFAULTS`.

3. Resizing an iSCSI Volume

It is highly recommended to resize an iSCSI LUN in conjunction with LVM by performing the following steps:

- On the V-Switch, expose a physical storage on a new iSCSI target.
- Reboot the Linux server.
- Verify that you can see the new iSCSI volume using commands: `ISCSI-LS` and `FDISK -L`.
- Resize a logical volume within LVM using the usual procedures for doing so.