Setting Up the Dell™ DR Series System as a CIFS or VTL Backup Target on EMC® Networker®

Dell Engineering
June 2015

A Dell Technical White Paper

Revisions

Date	Description
January 2014	Initial release
April 2015	Added VTL Content for v3.2 Release
June 2015	Added content for configuring an iSCSI target for Linux

Table of contents

Executive summary

This paper provides information about how to set up the Dell DR Series system as a backup target for EMC Networker software. This whitepaper is a quick reference guide and does not include all DR Series system deployment best practices.

For additional information, see the DR Series system documentation and other data management application best practices whitepapers for your specific DR Series system at:

http://www.dell.com/powervaultmanuals

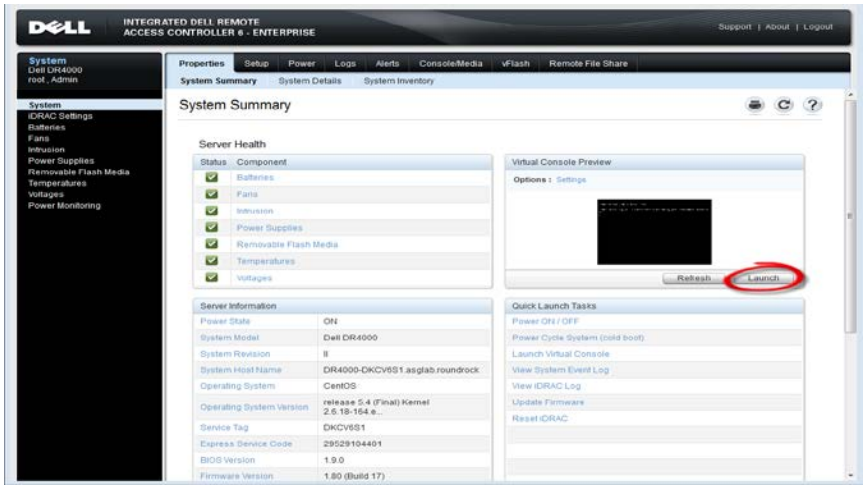
Note: The DR Series system and EMC Networker screenshots used for this whitepaper may vary slightly, depending on the firmware version of the DR Series system or the software you are using.

1 Installing and configuring the DR Series system

1. Rack and cable the DR Series system and power it on.

2. Initialize the DR Series system. For more information, see following topics “iDRAC Connection”, “Logging in and Initializing the DR Series System”, and “Accessing iDRAC6/iDRAC7 Using RACADM” in the *Dell DR Series System Administrator Guide*.

3. Log on to iDRAC using the default address **192.168.0.120** with the user name: **root** and password: **calvin**, or log on with the IP that is assigned to the iDRAC interface.

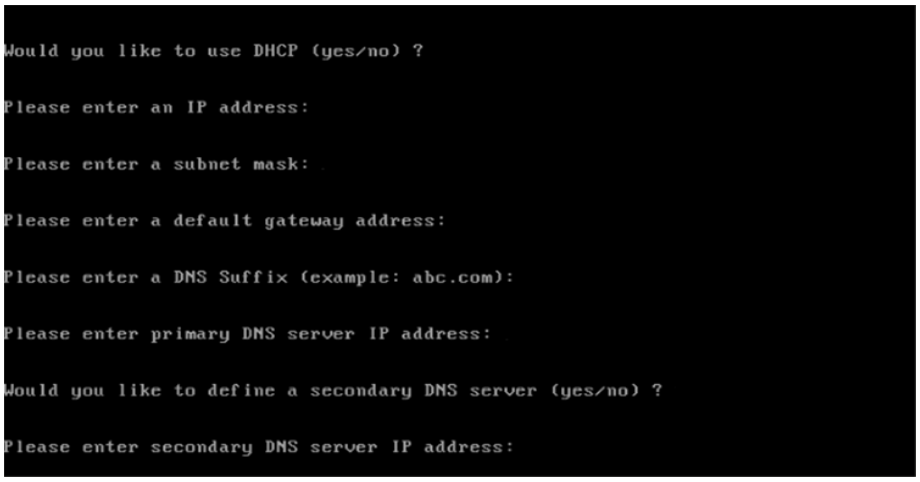


4. Click the **Launch** button to launch the virtual console.

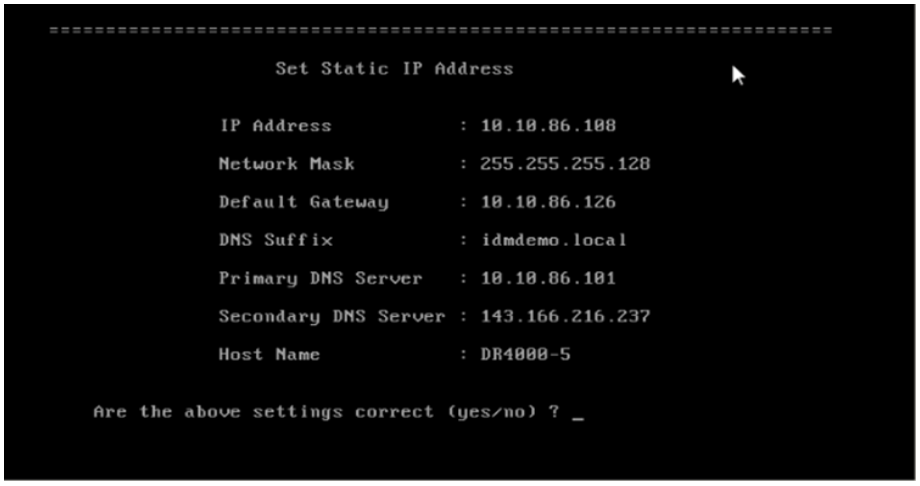
5. When the virtual console opens, log on to the system as:
   user: **administrator**, password: **St0r@ge!**

   NOTE: The "0" in the password is the numeral zero.

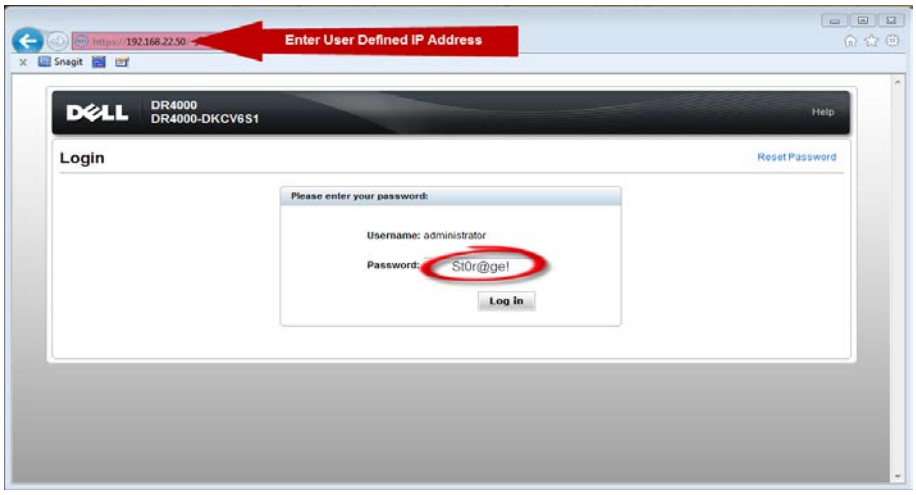
6. Set the user-defined networking preferences.



7. View the network preferences summary and confirm if the settings are correct.



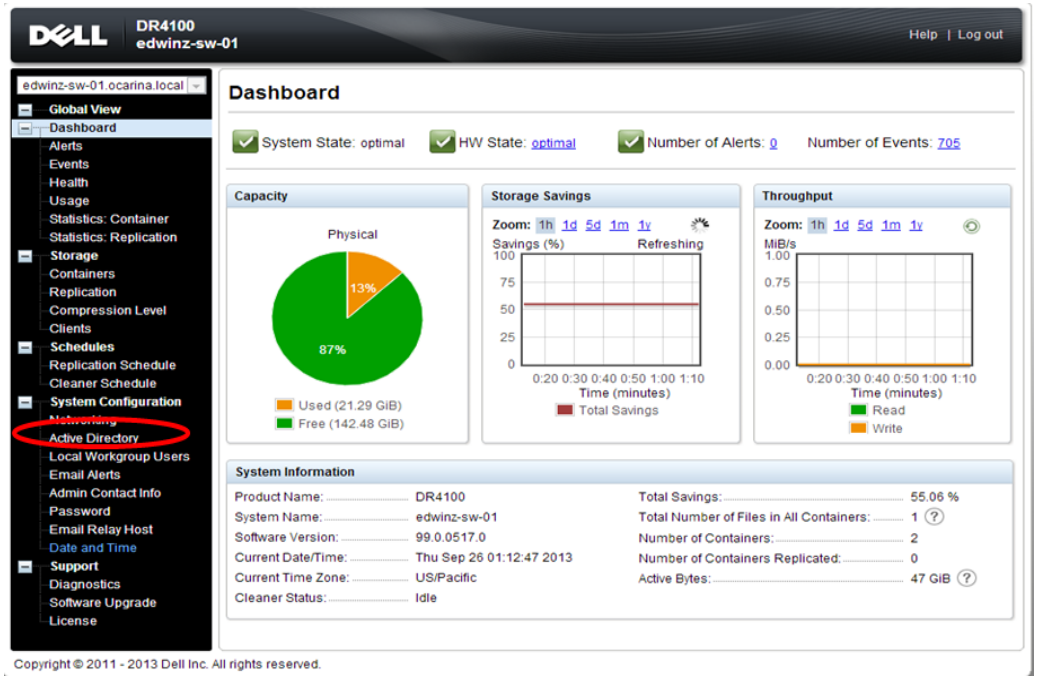
8. Log on to the DR Series system administrator console, using the IP address you just provided for the DR Series system as:
   user: **administrator**, password **St0r@ge!**



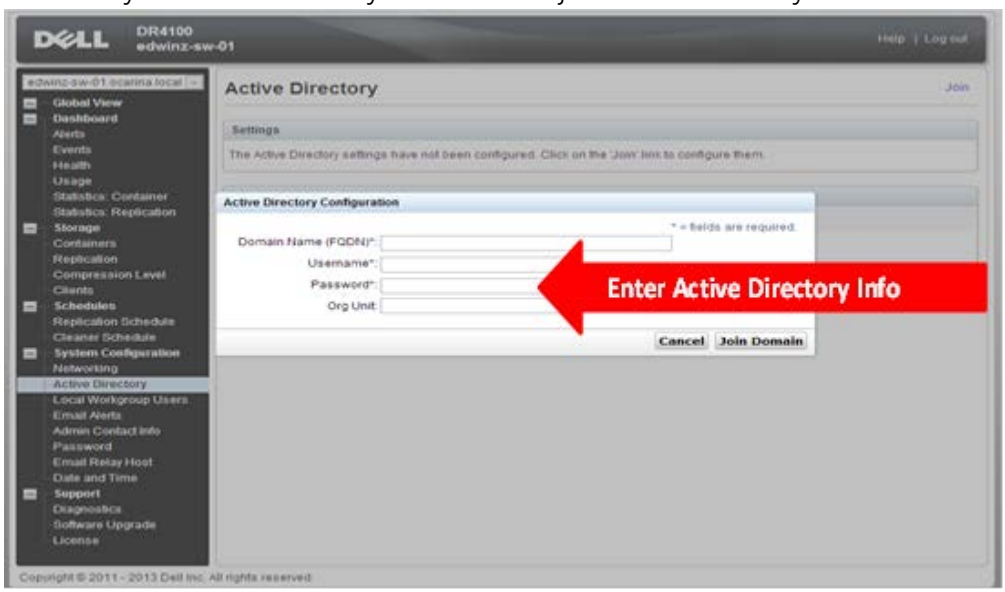
9. Join the DR Series system to Active Directory.

> **Note:** If you do not want to add the DR Series system to Active Directory, see the *DR Series System Owner's Manual* for guest login instructions.

   a. Select **Active Directory** from the navigation area of the GUI.



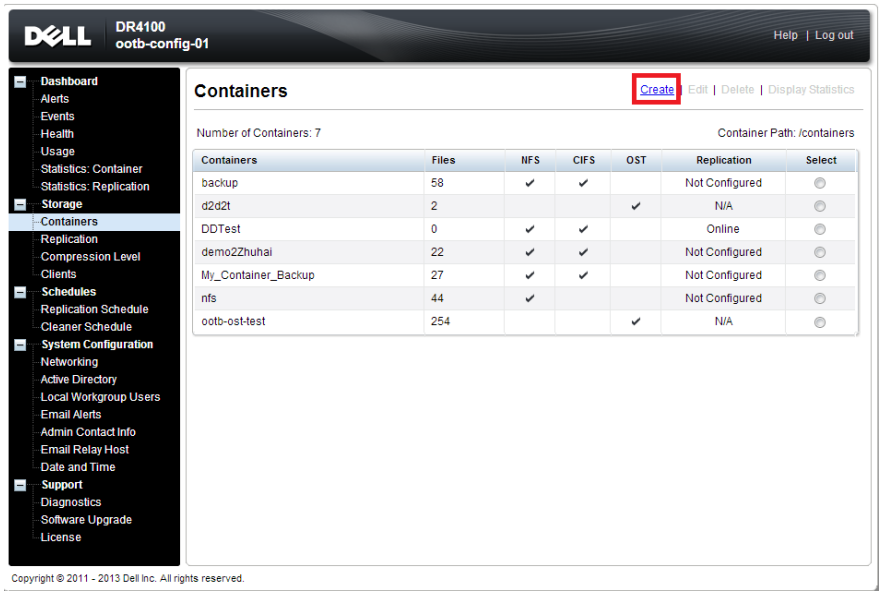
b. Enter your Active Directory credentials to join the DR Series system to a domain.



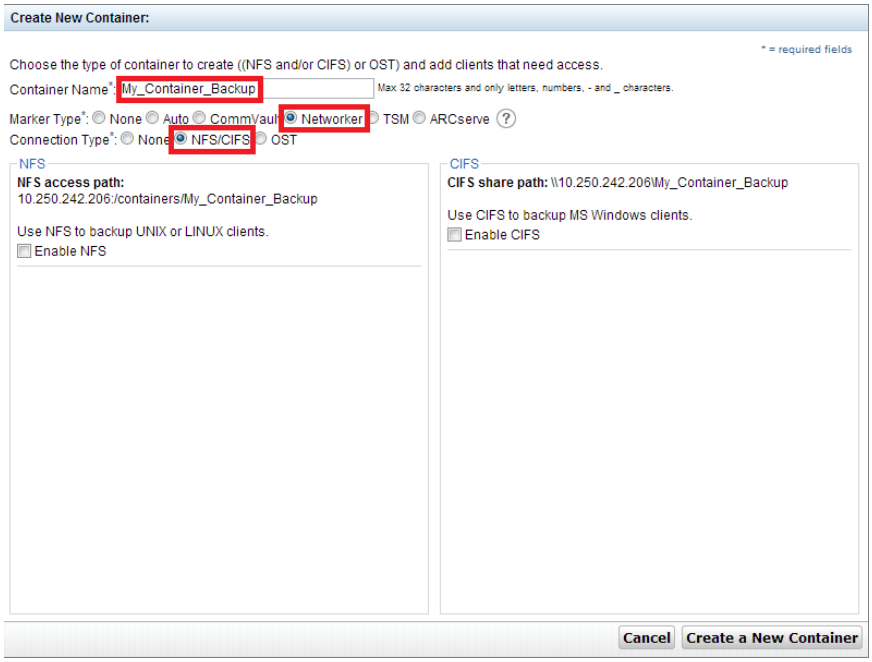
2 Creating and configuring CIFS target container(s) for Networker

2.1 Creating the network share container for Networker use

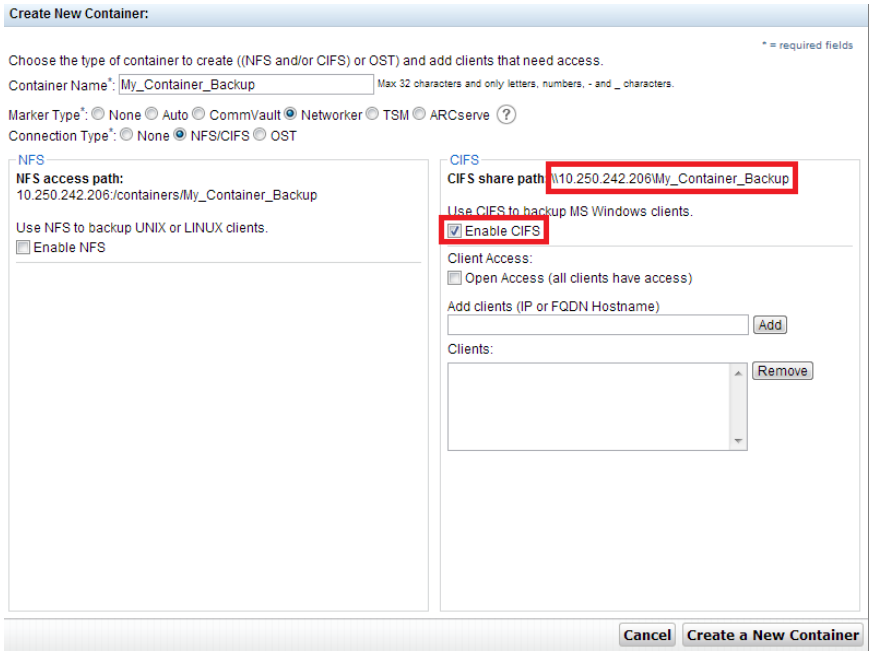
1. Create and mount the container by selecting **Containers** in the navigation area of the GUI, and then clicking **Create** at the top of the page.



2. Enter a Container Name, select the Marker Type as **Networker**, and select the Connection Type as **NFS/CIFS**.



3. Under the **CIFS** section, note down the **CIFS share path** (this will be used in configuring the device on the Networker server), and select **Enable CIFS**. For the Client Access section, select either **Open Access** or manually add clients to the Clients list.



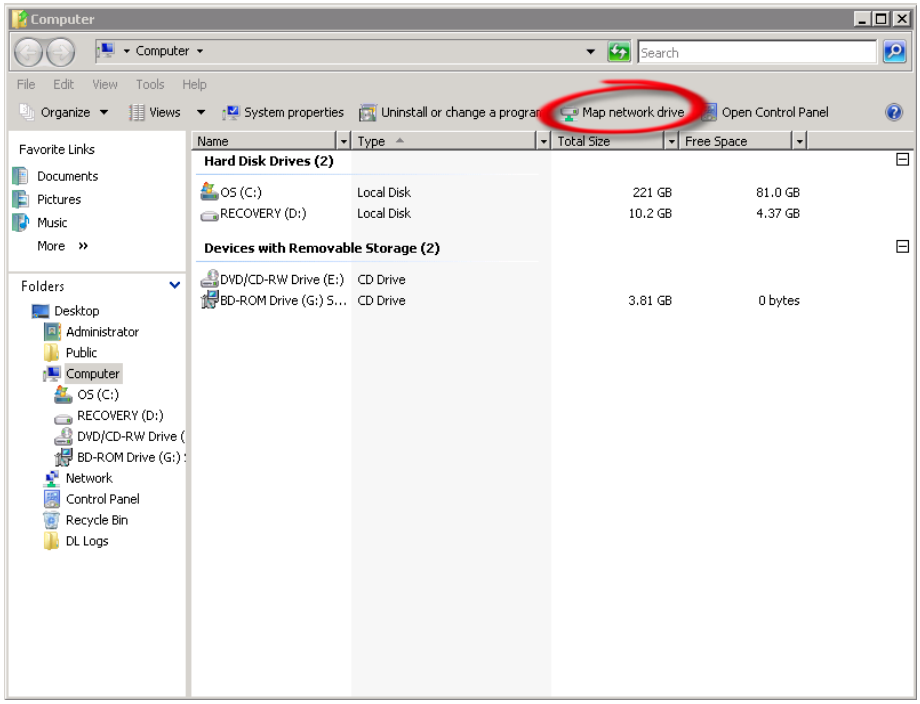
Note: For improved security, Dell recommends adding IP addresses for the backup console (Networker Server), Networker storage nodes, and Networker clients. Not all environments will have all components.

4. Click Create a New Container and confirm that the container is added.

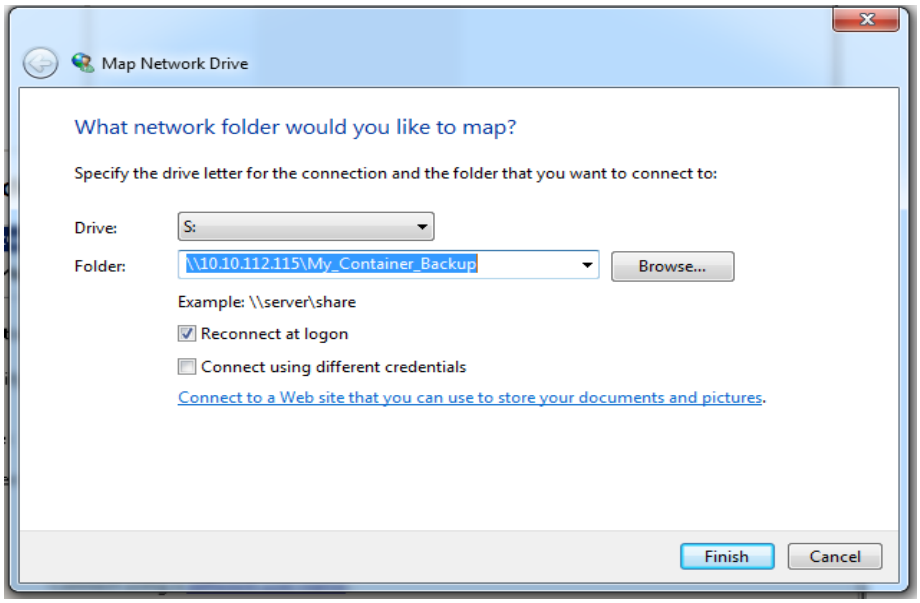
2.2 Configuring the Networker storage node – Windows CIFS

1. Log on to the storage node and click **Start** > **My Computer**.

2. Click **Map network drive**.



3. In the **Map Network Drive** window, in the **Folder** field, enter the path to the container on the DR Series system.



4. Select **Reconnect at logon**.

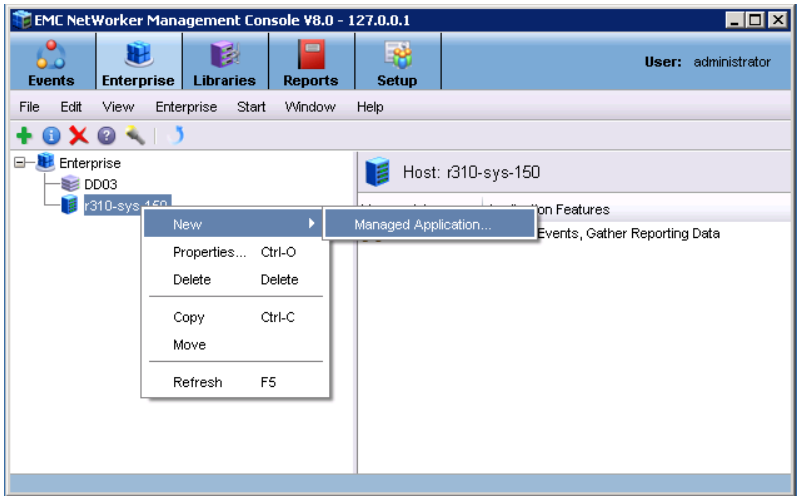
5. When prompted, enter the CIFS credential to authenticate on the Active Directory domain. The DR Series system container is now mounted to your backup server.

6. If Client Direct is used, make sure all the clients can access the same DR container share using this path. Otherwise, separate **Client Direct Paths** must be entered with the actual paths that clients use to access the DR container share (please refer to step 10 in the next section **Set up Networker**).

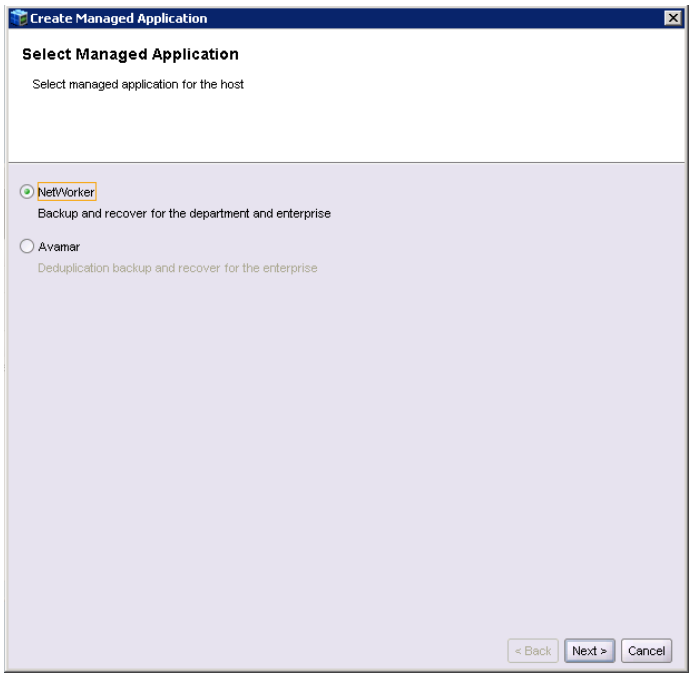
2.3 Configuring Networker to use the newly created network share

1. Open the **Networker Management Console (NMC)**.

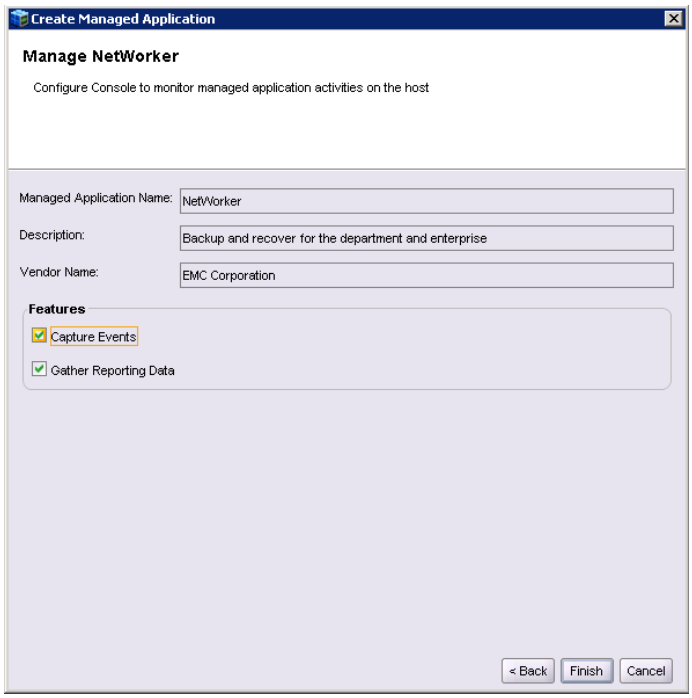
2. Click the **Enterprise** menu button, select the storage node that the DR Series system share will be configured as a backup device, right-click the host, and then click **New** > **Managed Application**.



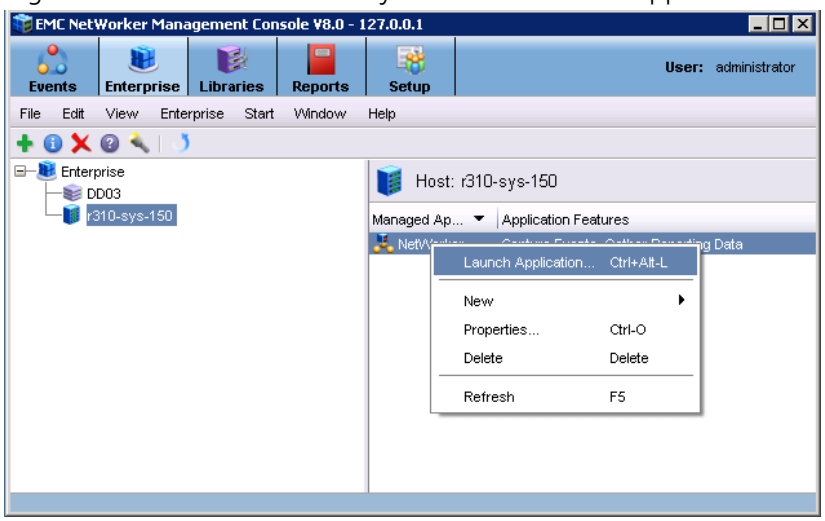
3. Select **Networker** and click **Next**.



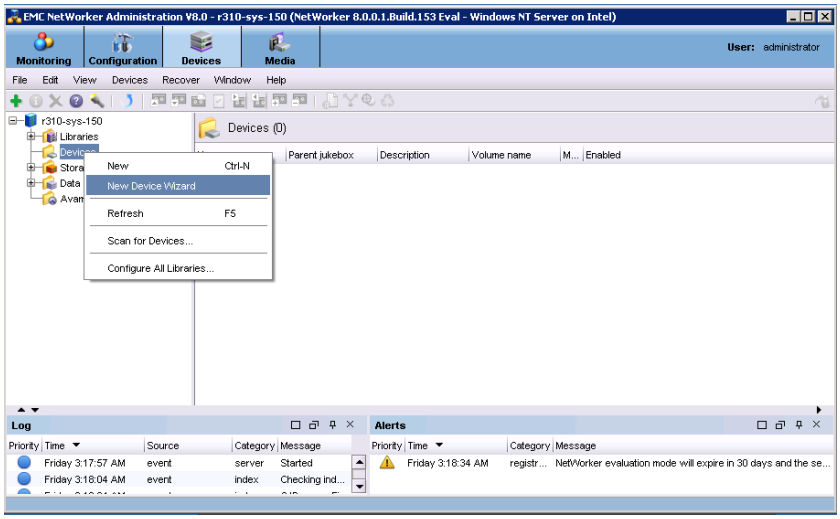
4. Click **Finish**.



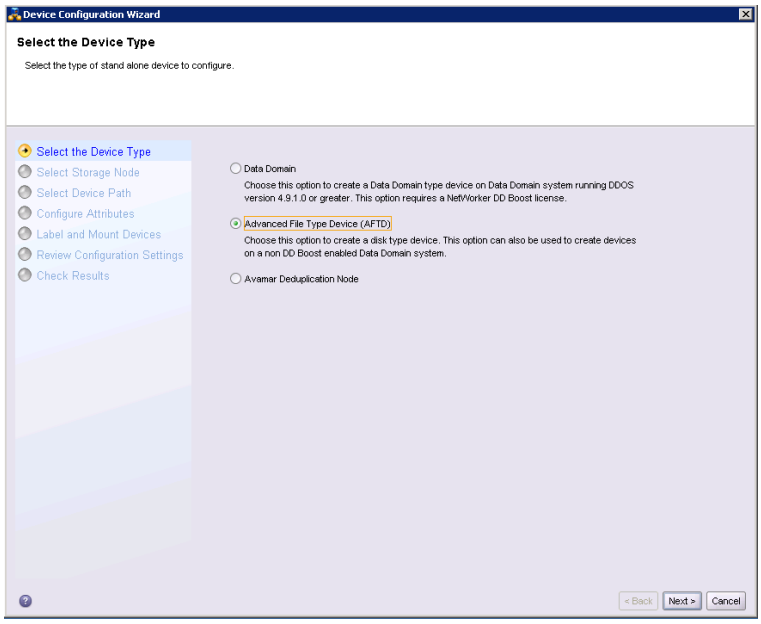
5. Right-click and select the newly created Networker application and click **Launch Application**.



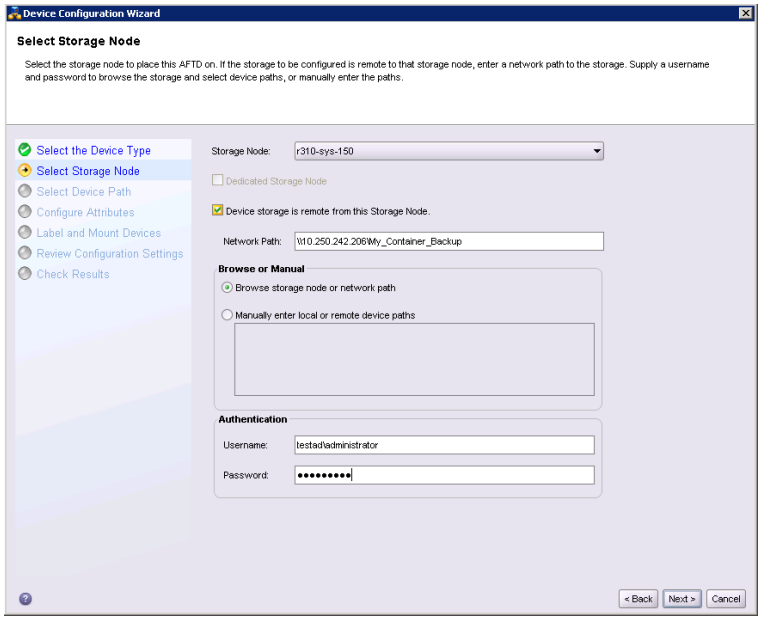
6. In the Devices window, right-click **Device** in the left panel and click **New Device Wizard**.



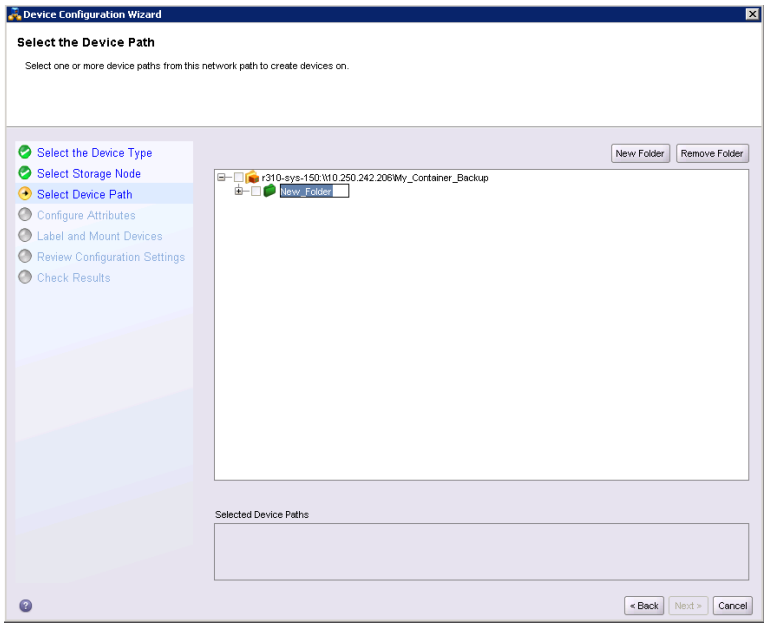
7. Select **Advanced File Type Device (AFTD)**.

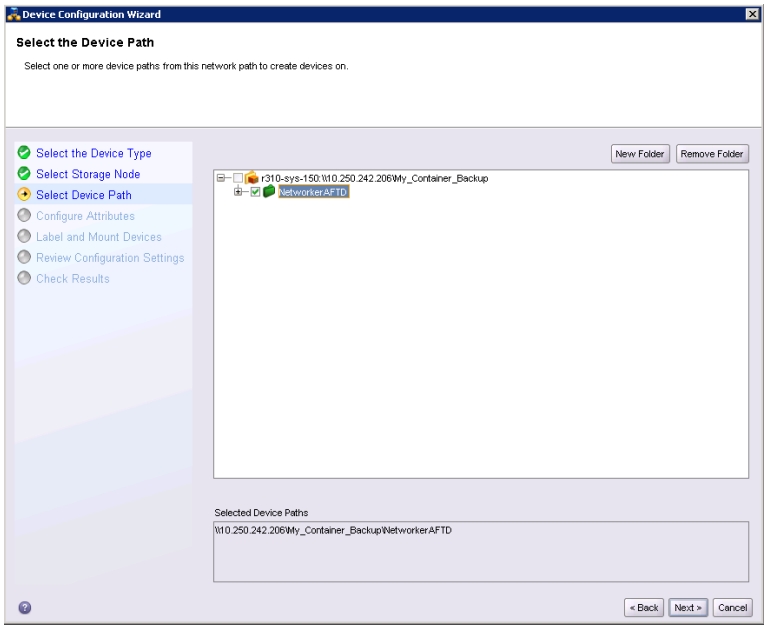


8. In the next dialog box, select **Device storage is remote from this Storage Node,** type in the network path of the DR Series system container share location (if name resolution works, the hostname or FQDN can be used in the server portion of the network path). In the Authentication section, type the CIFS credentials to access the DR Series system share. Click **Next**.



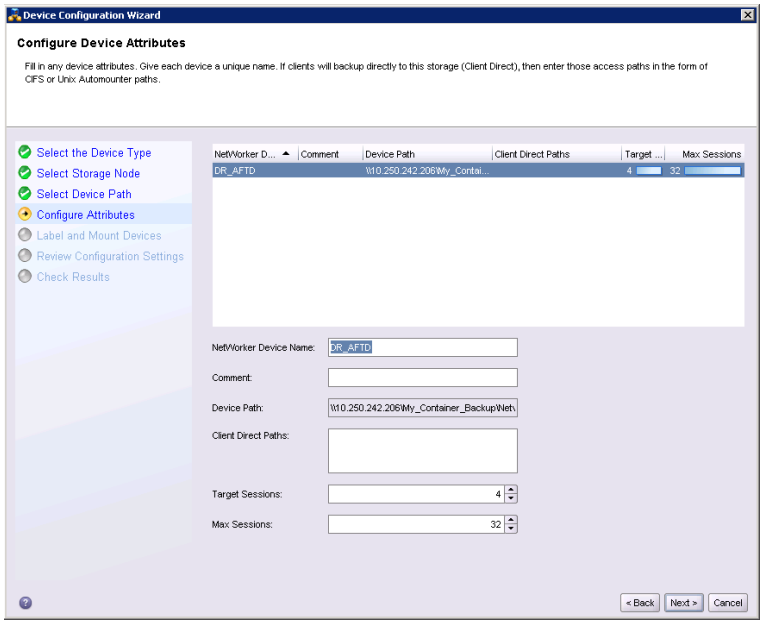
9. Click **New Folder**, type an appropriate folder name, select the folder, and click **Next**.



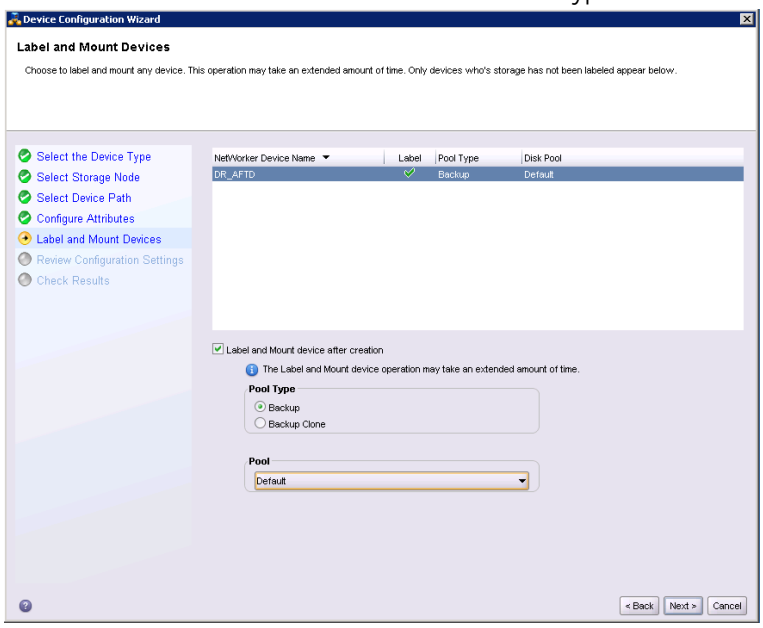


10. Set the session attributes according to the Networker administration documentation and click **Next**.

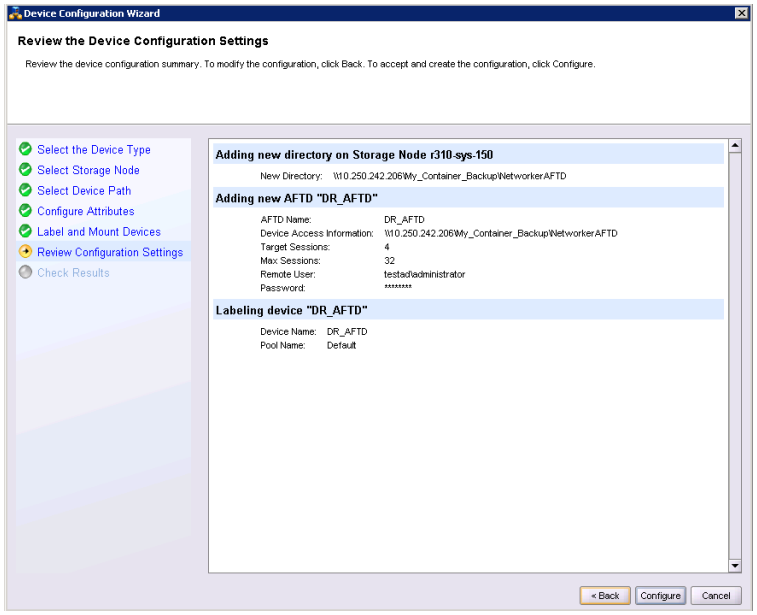
    If the Client Direct feature will be used, different device path(s) that clients use to access the DR Series system container share can be entered into the **Client Direct Paths** (please refer to step 6 in the last section **Configure Networker Storage Node**). If all of the clients are able to access the DR Series system container share using the direct path, there is no need to enter extra client direct paths.



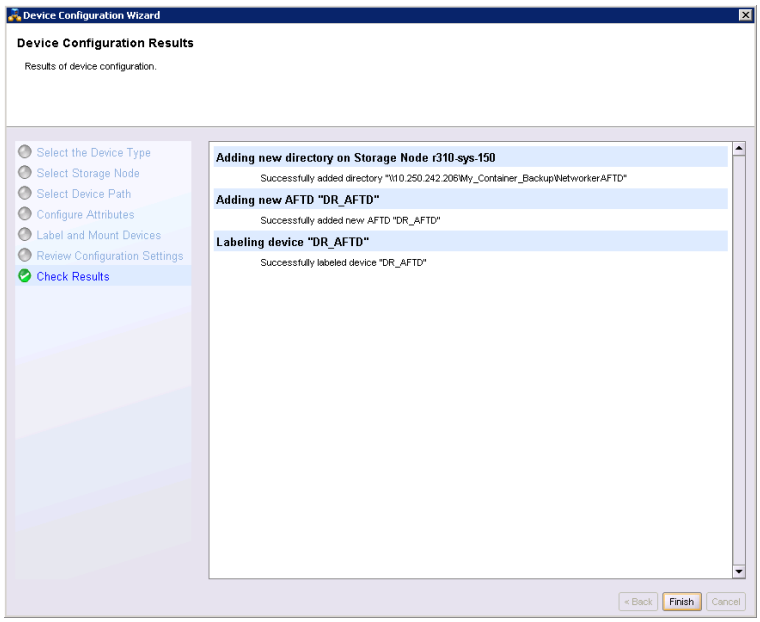
11. The new Networker device should have Pool Type set to **Backup**. Click **Next**.



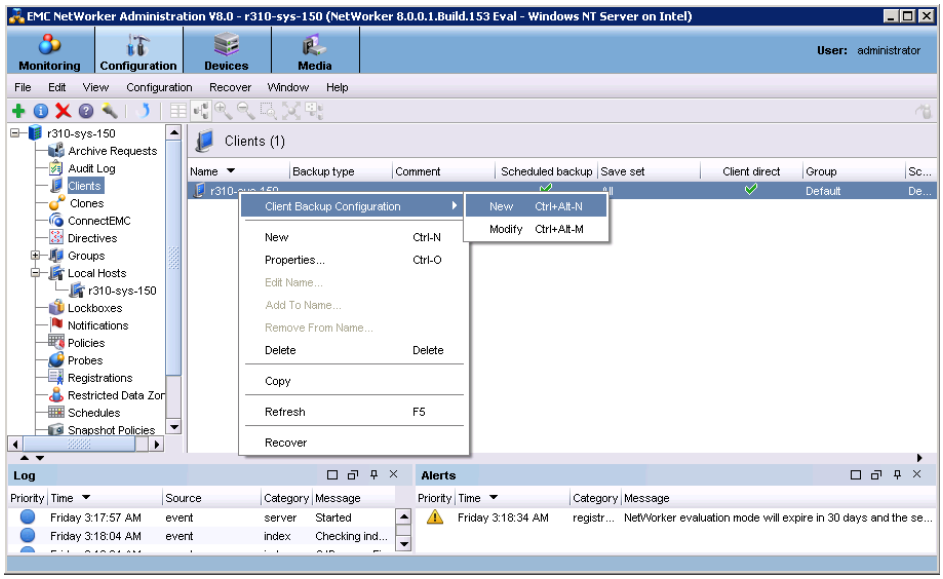
12. Review the configuration and then click **Configure**.



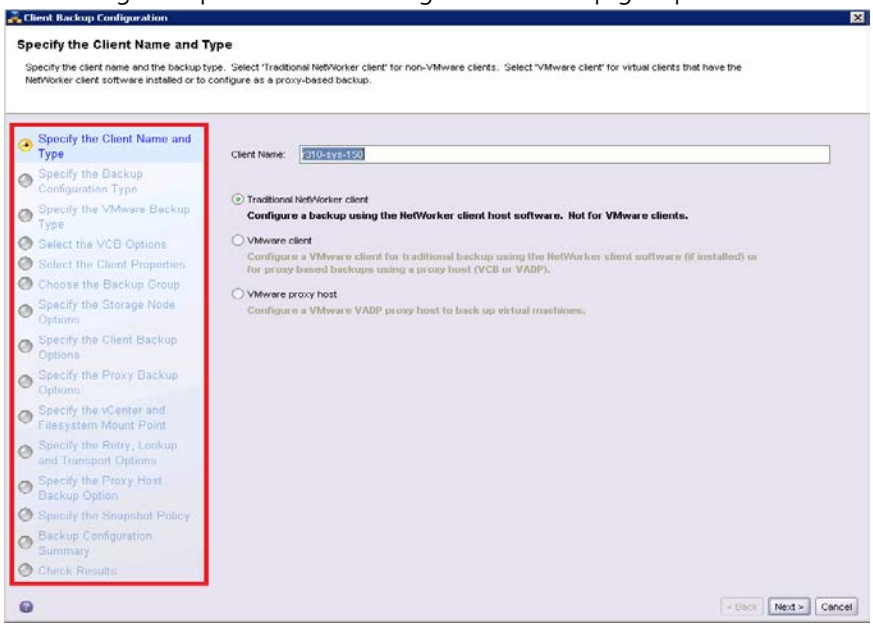
13. Click **Finish**.

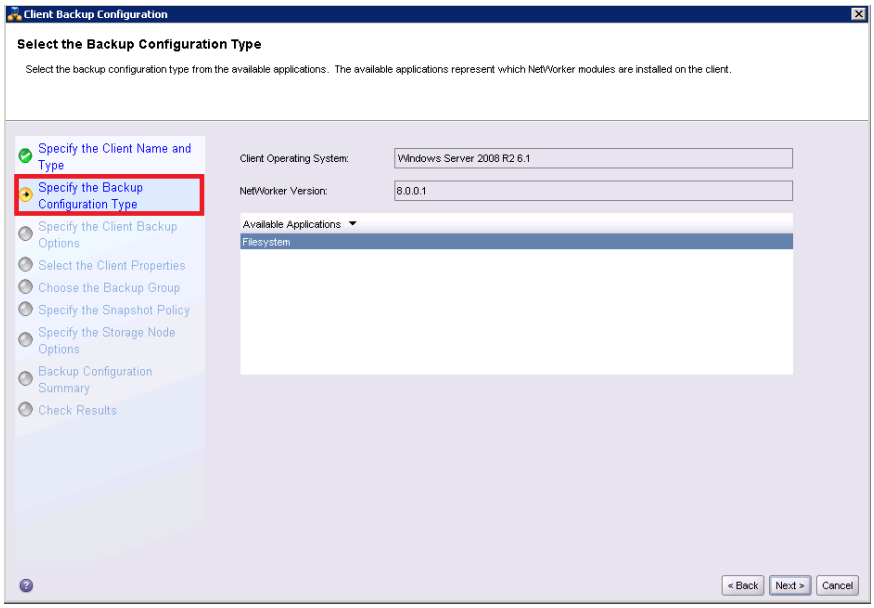


14. On the **Configuration** tab, select **Clients**, right-click the client that will be backed up, select **Client Backup Configuration** and click **New**.

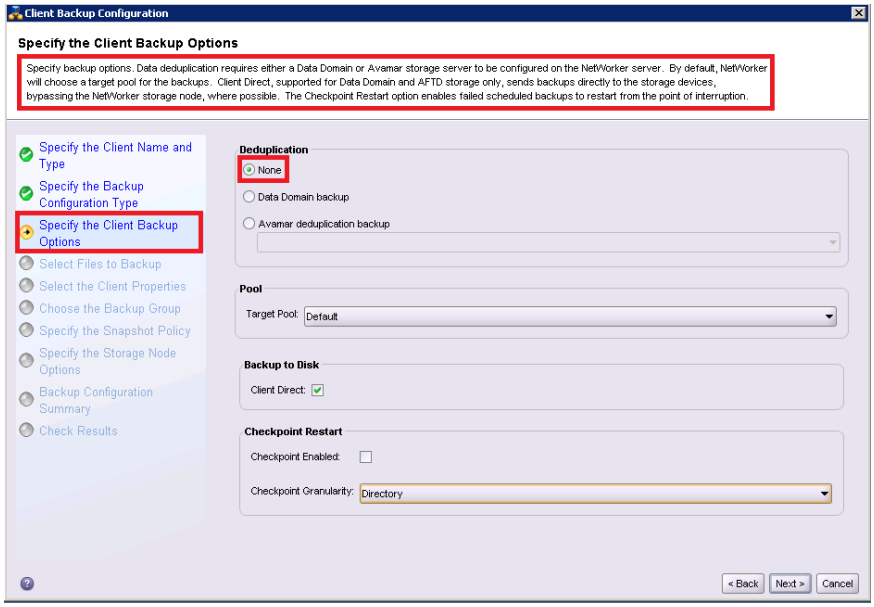


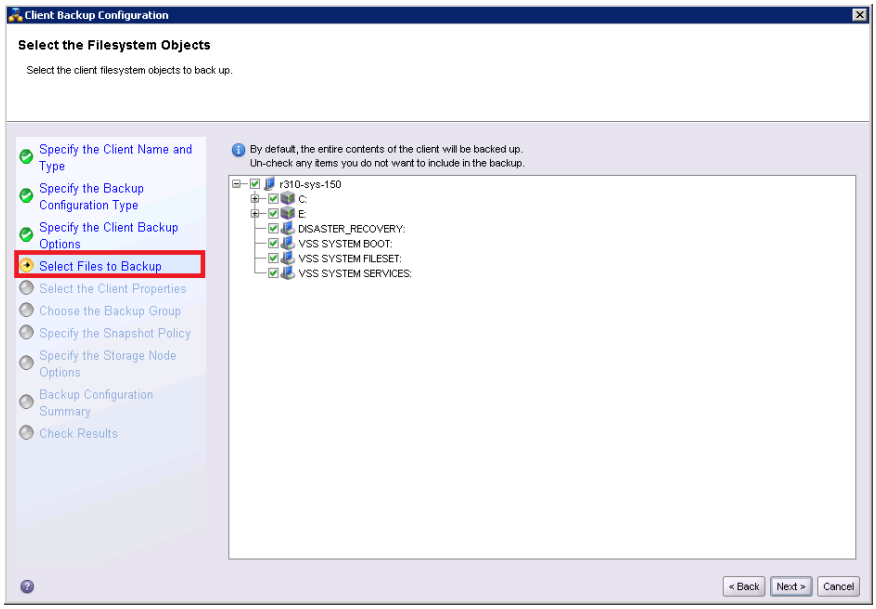
15. Go through the process of creating a new backup group.

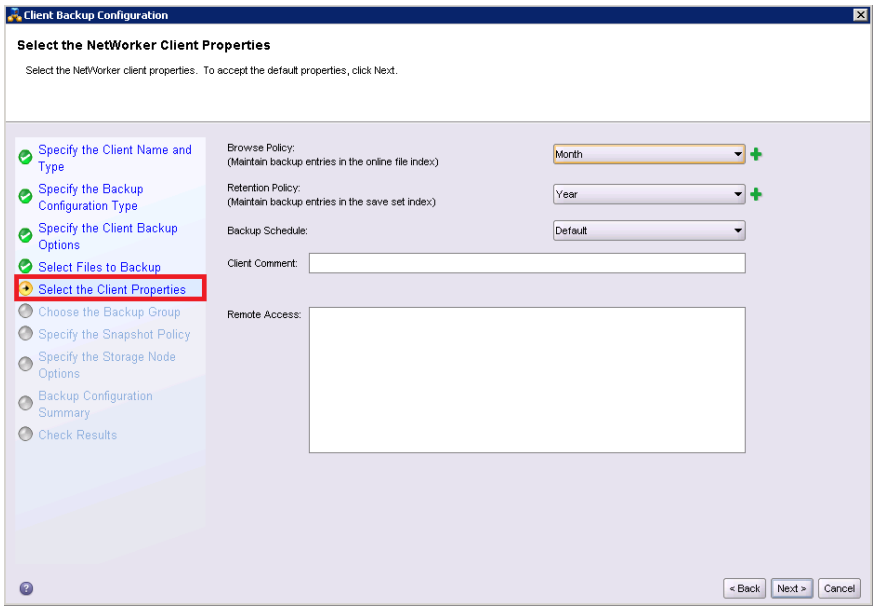


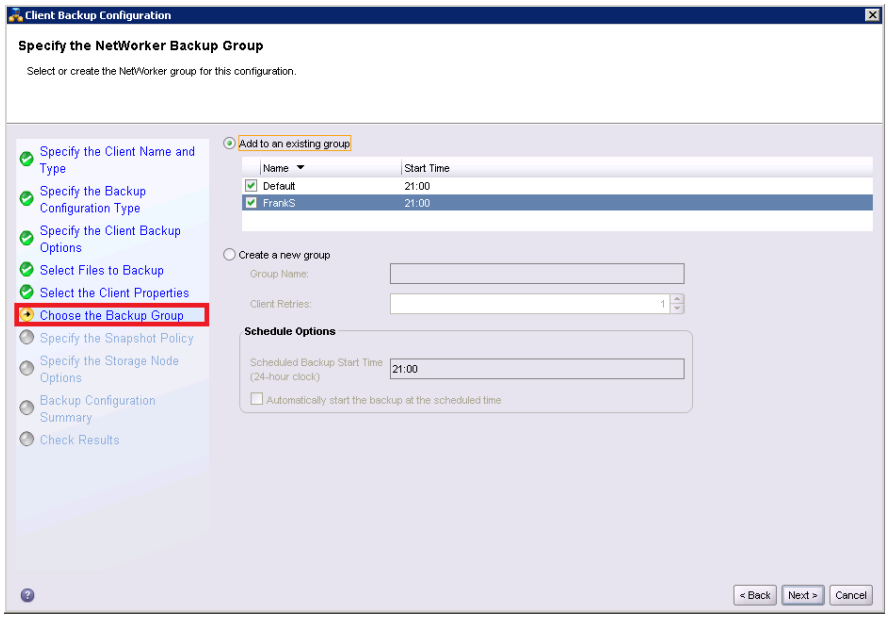


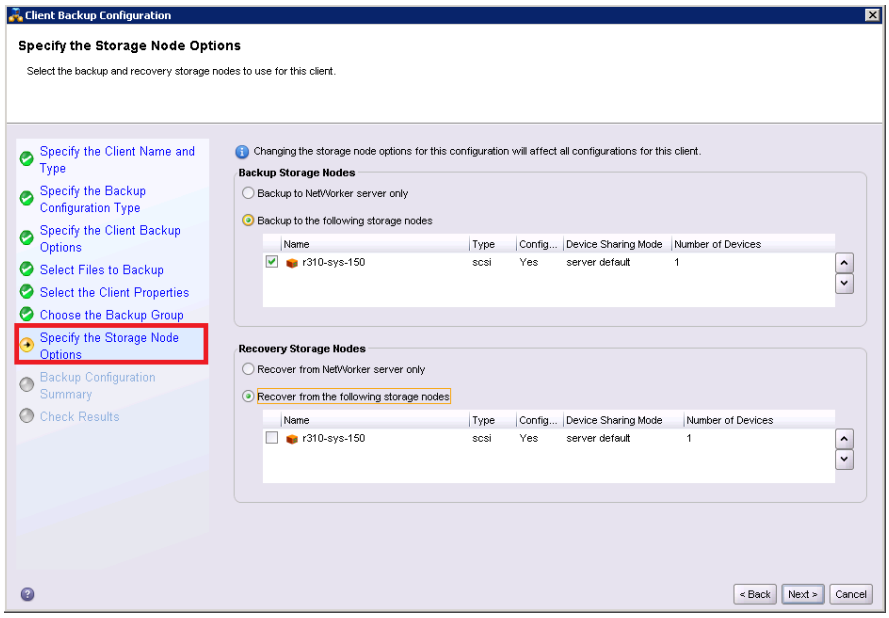
16. In Specify the Client Backup Options, define the following settings as follows.
    a. **Deduplication** should be set as **None**
    b. **Target Pool** should be set as the pool that has the DR Series system device included.
    c. **Client Direct** can be enabled if the client is directly backing up data to a preferred DR, thus bypassing the storage node that is managing the DR share. For Client Direct to work, the DR device must have at least one device path that the client can use to directly access the DR container share. Refer to step 6 in the last section **Configure the Networker Storage Node**, and step 10 in this section.

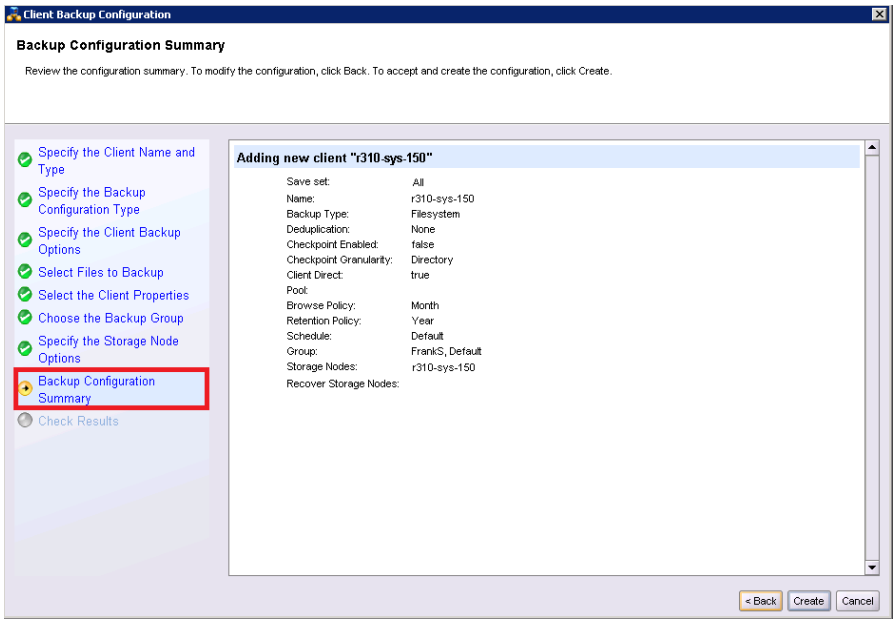

Client Backup Configuration
Specify the Client Backup Options
Specify backup options. Data deduplication requires either a Data Domain or Avamar storage server to be configured on the NetWorker server. By default, NetWorker will choose a target pool for the backups. Client Direct, supported for Data Domain and AFTD storage only, sends backups directly to the storage devices, bypassing the NetWorker storage node, where possible. The Checkpoint Restart option enables failed scheduled backups to restart from the point of interruption.
Specify the Client Name and Type
Specify the Backup Configuration Type
Specify the Client Backup Options
Select Files to Backup
Select the Client Properties
Choose the Backup Group
Specify the Snapshot Policy
Specify the Storage Node Options
Backup Configuration Summary
Check Results
Deduplication
None
Data Domain backup
Avamar deduplication backup
Pool
Target Pool: Default
Backup to Disk
Client Direct:
Checkpoint Restart
Checkpoint Enabled:
Checkpoint Granularity: Directory
< Back
Next >
Cancel


Client Backup Configuration
Select the Filesystem Objects
Select the client filesystem objects to back up.
Specify the Client Name and Type
Specify the Backup Configuration Type
Specify the Client Backup Options
Select Files to Backup
Select the Client Properties
Choose the Backup Group
Specify the Snapshot Policy
Specify the Storage Node Options
Backup Configuration Summary
Check Results
By default, the entire contents of the client will be backed up.
Un-check any items you do not want to include in the backup.
r310-sys-150
C:
E:
DISASTER_RECOVERY:
VSS SYSTEM BOOT:
VSS SYSTEM FILESET:
VSS SYSTEM SERVICES:
< Back
Next >
Cancel

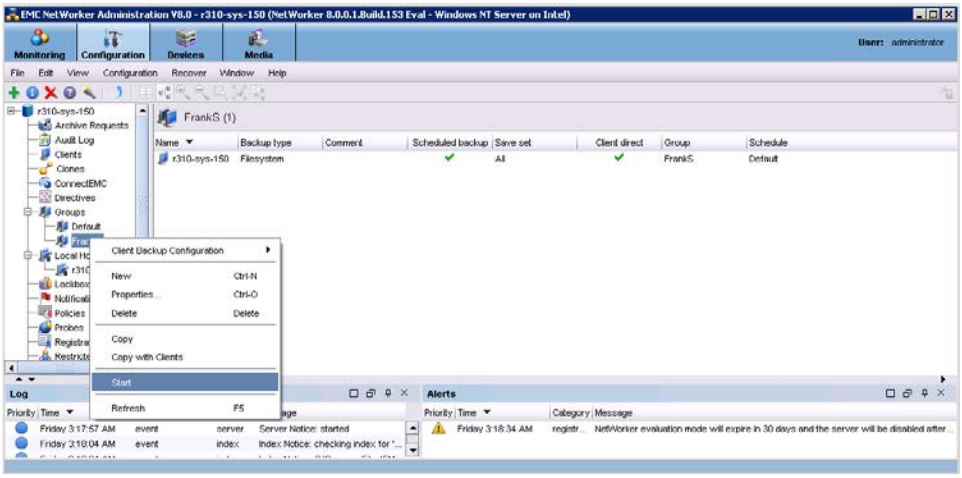

Client Backup Configuration
Select the NetWorker Client Properties
Select the NetWorker client properties. To accept the default properties, click Next.
Specify the Client Name and Type
Specify the Backup Configuration Type
Specify the Client Backup Options
Select Files to Backup
Select the Client Properties
Choose the Backup Group
Specify the Snapshot Policy
Specify the Storage Node Options
Backup Configuration Summary
Check Results
Browse Policy:
(Maintain backup entries in the online file index)
Month
Retention Policy:
(Maintain backup entries in the save set index)
Year
Backup Schedule:
Default
Client Comment:
Remote Access:
< Back
Next >
Cancel


Client Backup Configuration
Specify the NetWorker Backup Group
Select or create the NetWorker group for this configuration.
Specify the Client Name and Type
Specify the Backup Configuration Type
Specify the Client Backup Options
Select Files to Backup
Select the Client Properties
Choose the Backup Group
Specify the Snapshot Policy
Specify the Storage Node Options
Backup Configuration Summary
Check Results
Add to an existing group
Name
Start Time
Default
21:00
FrankS
21:00
Create a new group
Group Name:
Client Retries:
Schedule Options
Scheduled Backup Start Time (24-hour clock)
21:00
Automatically start the backup at the scheduled time
< Back
Next >
Cancel

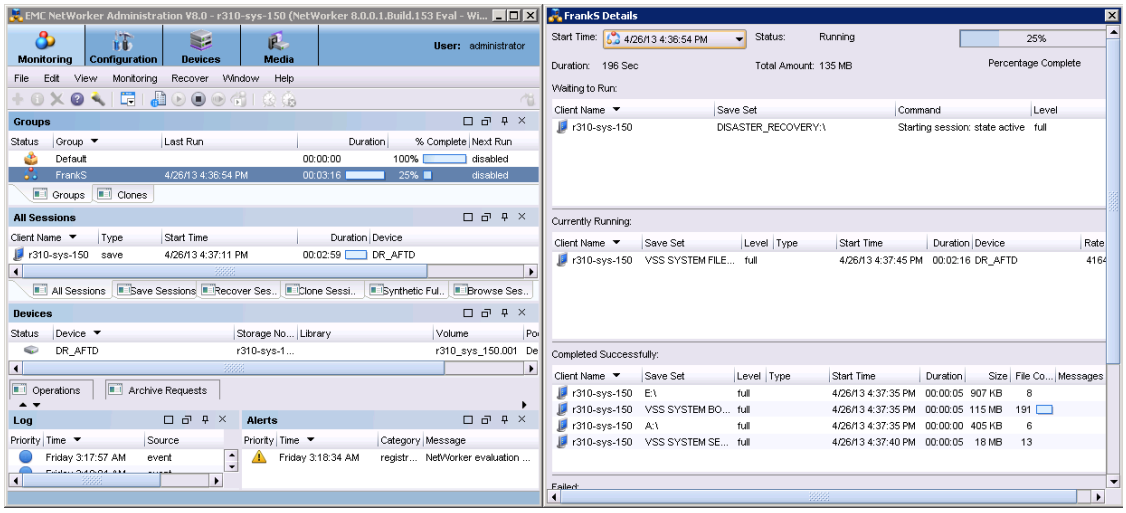

Client Backup Configuration
Specify the Storage Node Options
Select the backup and recovery storage nodes to use for this client.
Specify the Client Name and Type
Specify the Backup Configuration Type
Specify the Client Backup Options
Select Files to Backup
Select the Client Properties
Choose the Backup Group
Specify the Storage Node Options
Backup Configuration Summary
Check Results
Changing the storage node options for this configuration will affect all configurations for this client.
Backup Storage Nodes
Backup to NetWorker server only
Backup to the following storage nodes
Name
Type
Config...
Device Sharing Mode
Number of Devices
r310-sys-150
scsi
Yes
server default
1
Recovery Storage Nodes
Recover from NetWorker server only
Recover from the following storage nodes
< Back
Next >
Cancel


Client Backup Configuration
Backup Configuration Summary
Review the configuration summary. To modify the configuration, click Back. To accept and create the configuration, click Create.
Specify the Client Name and Type
Specify the Backup Configuration Type
Specify the Client Backup Options
Select Files to Backup
Select the Client Properties
Choose the Backup Group
Specify the Storage Node Options
Backup Configuration Summary
Check Results
Adding new client "r310-sys-150"
Save set: All
Name: r310-sys-150
Backup Type: Filesystem
Deduplication: None
Checkpoint Enabled: false
Checkpoint Granularity: Directory
Client Direct: true
Pool:
Browse Policy: Month
Retention Policy: Year
Schedule: Default
Group: FrankS, Default
Storage Nodes: r310-sys-150
Recover Storage Nodes:
< Back
Create
Cancel

17. After the backup group is successfully created, click **Start** to start the backup.



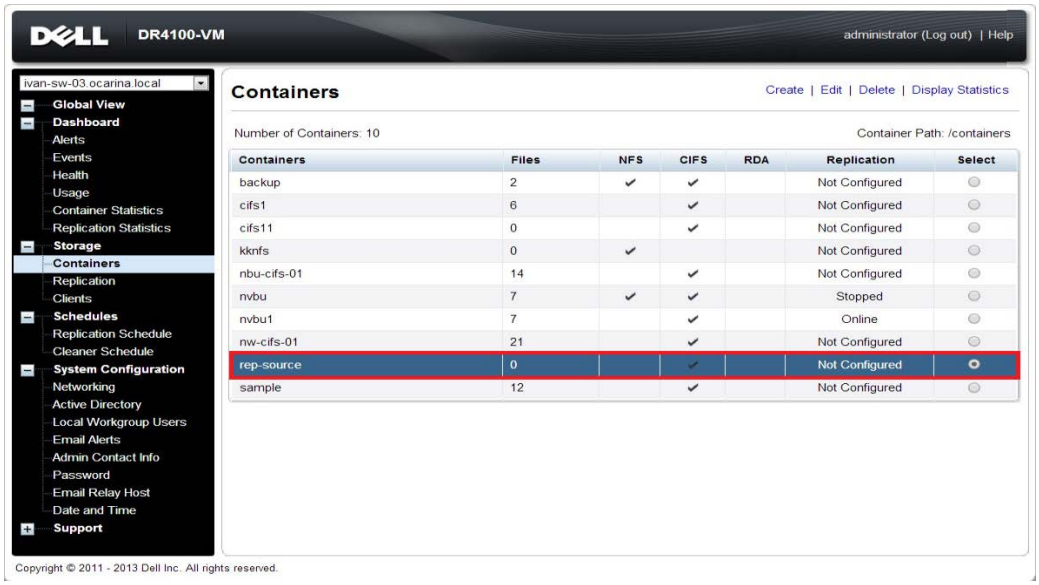
18. Monitor the job status in the **Monitoring** tab.



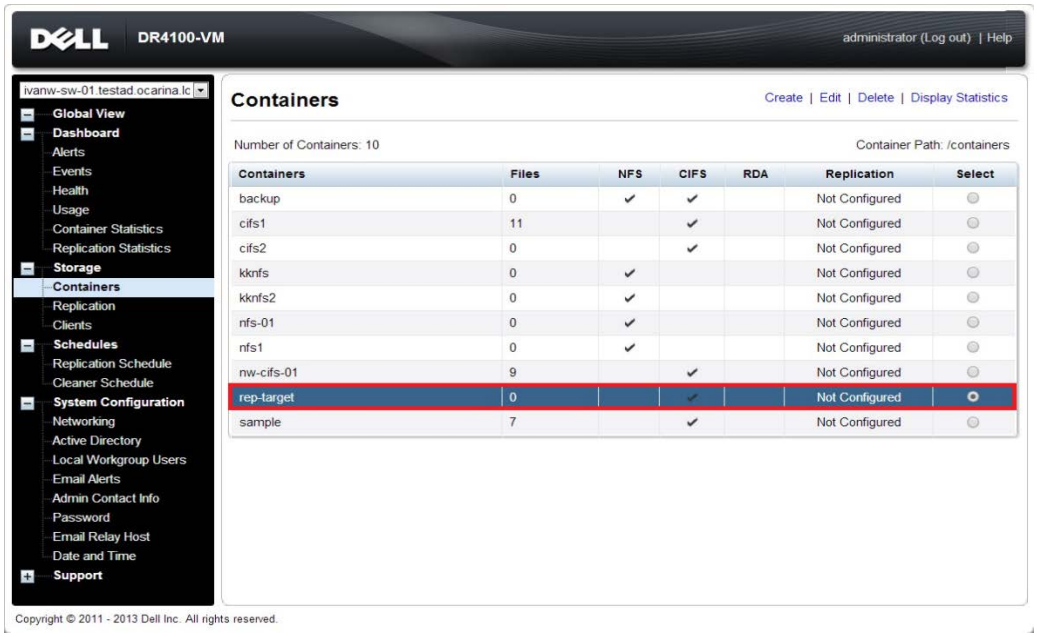
2.4 Setting up DR Series system replication and restore from the replication target

2.4.1 Creating a replication relationship between two DR Series systems

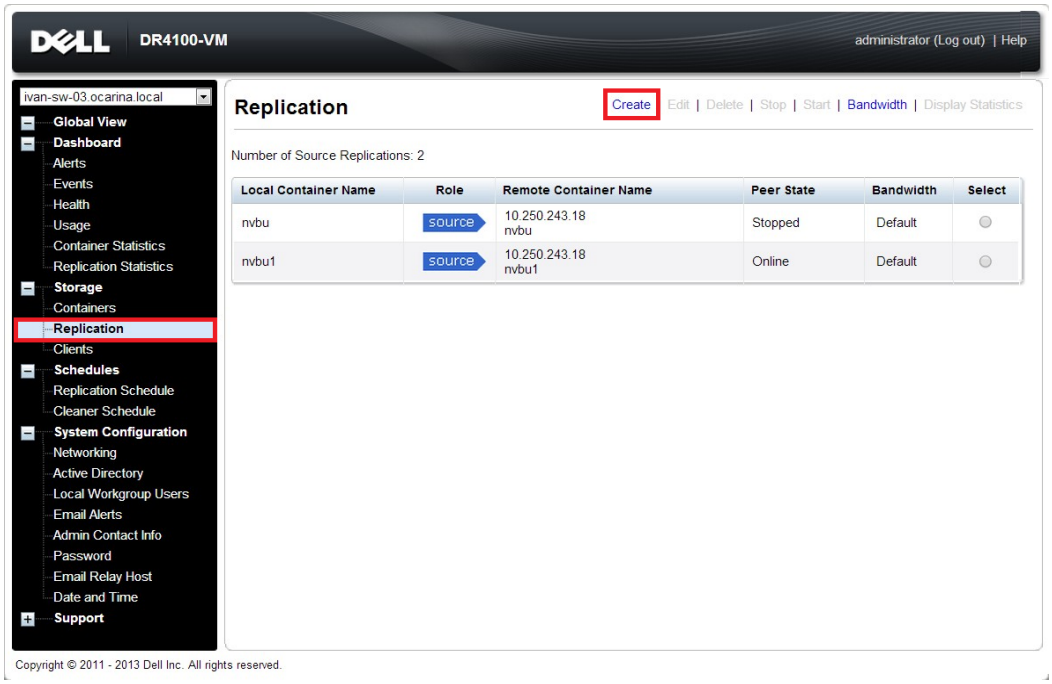
1. Create a source container on the source DR Series system.



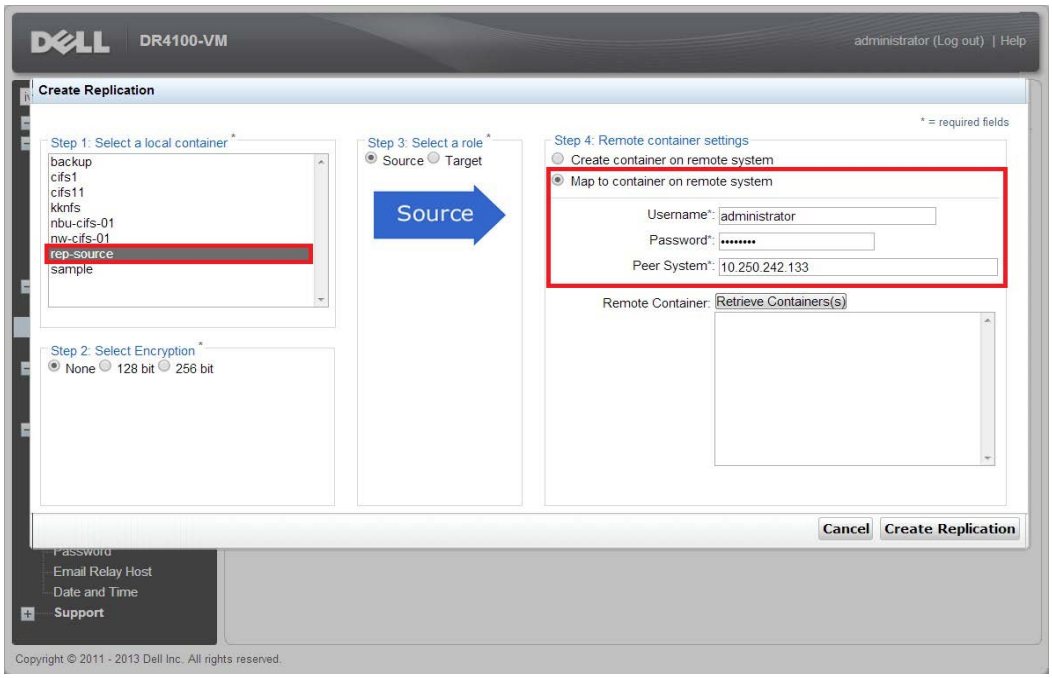
2. Create a target container on the target DR Series system.



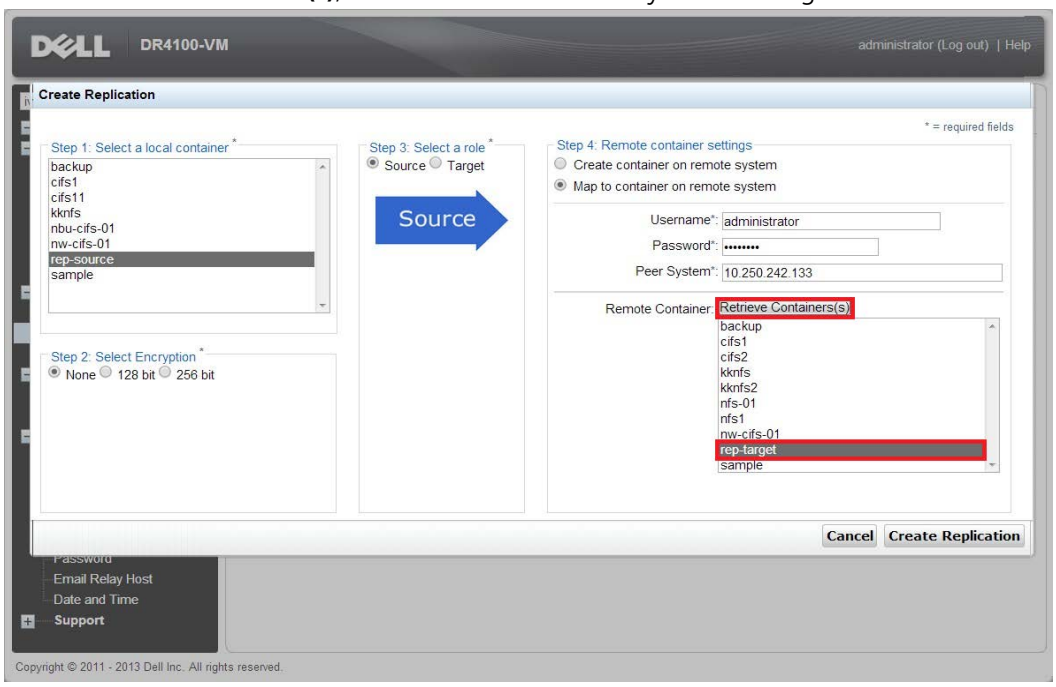
3. On the source DR Series system, go to the **Replication** menu, and then click **Create**.



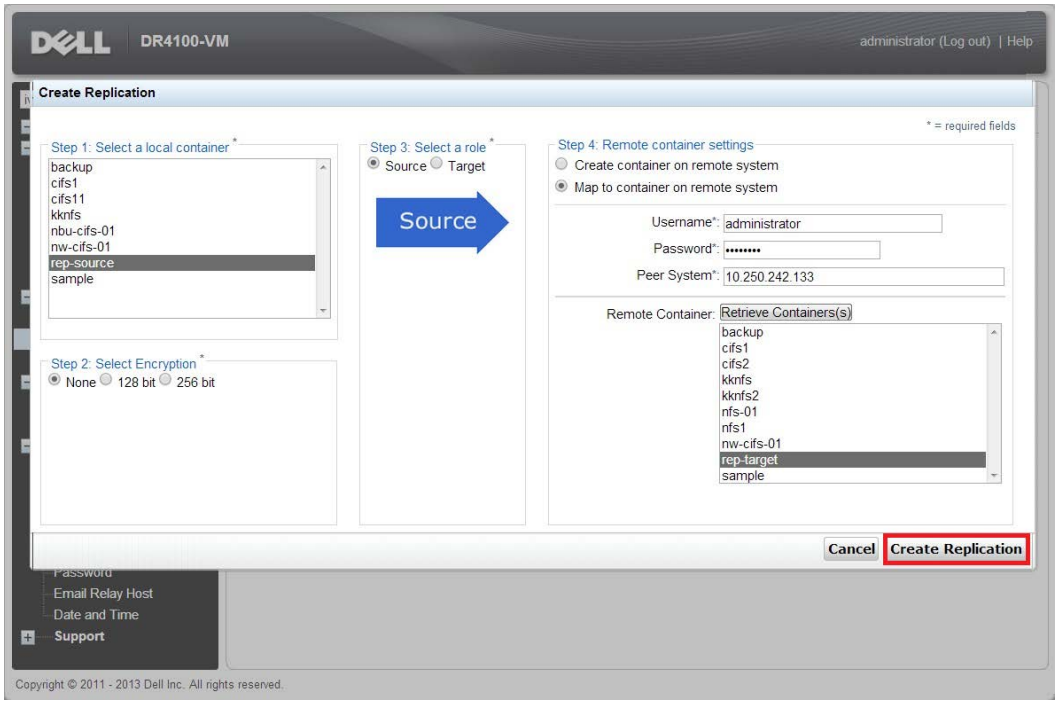
4. Select the newly created container as the source container, and then enter the target DR Series system information.



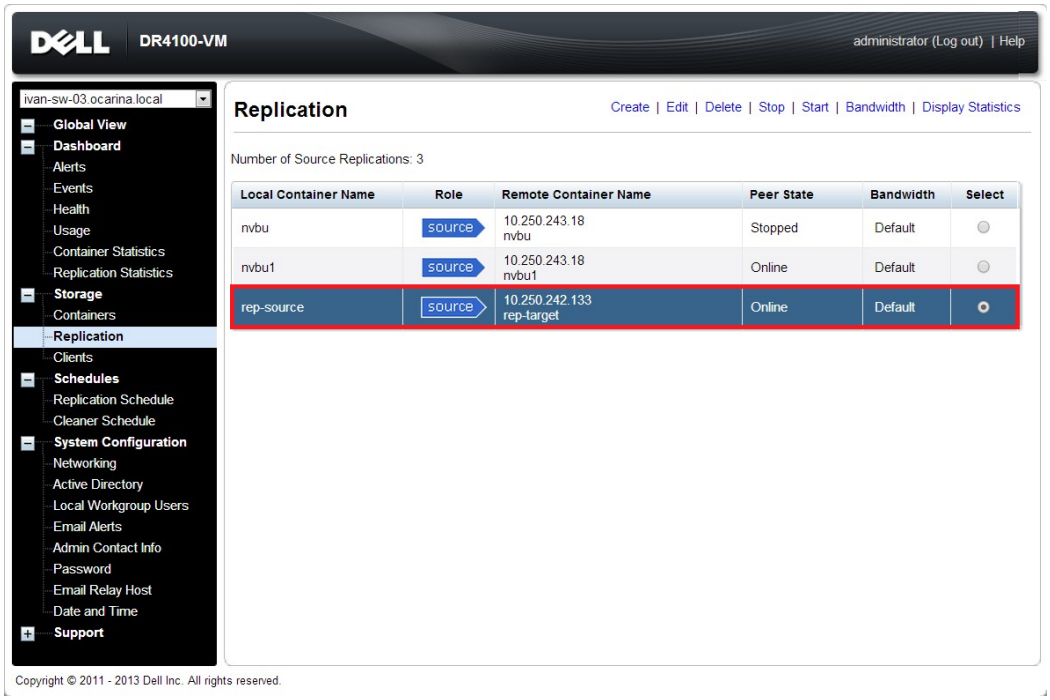
5. Click **Retrieve Container(s)**, and then select the newly created target container from the list.



6. Click **Create Replication**.

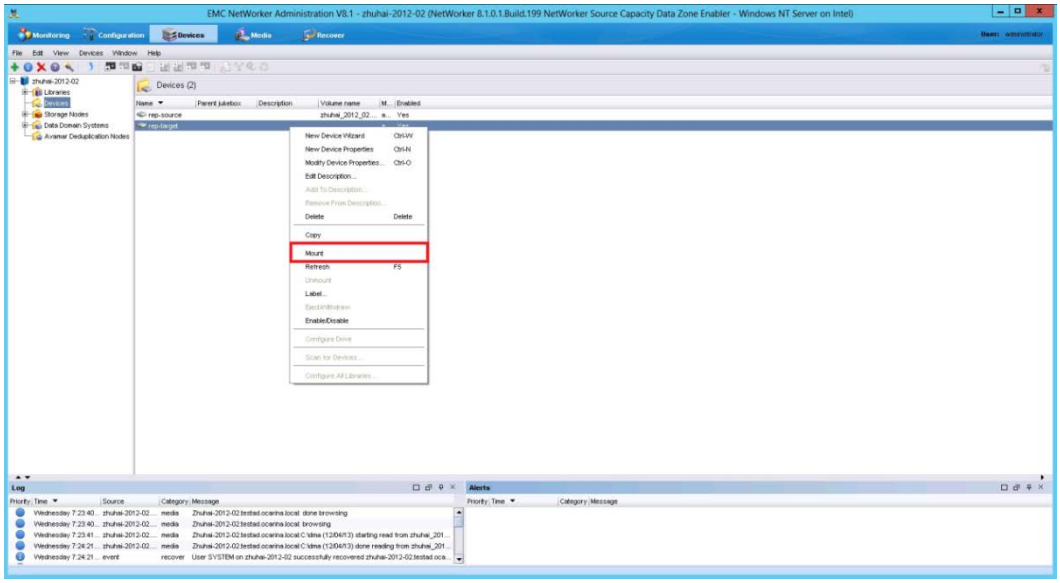


7. Verify that the replication relationship between the DR Series systems has been created and that the **Peer Status** is **Online**.



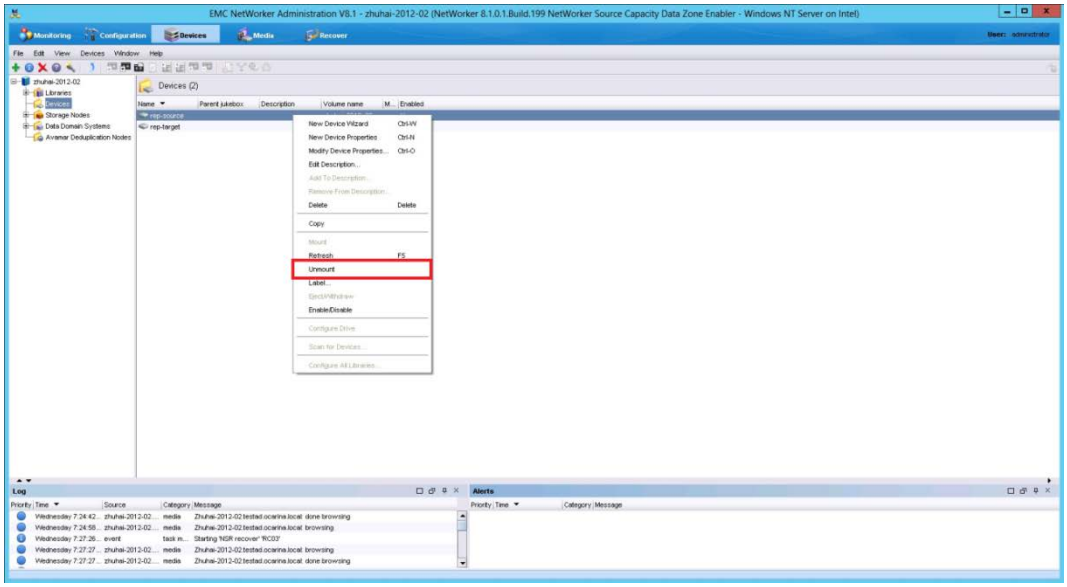
2.4.2 Restoring from the replication target container

1. Add the target container onto the Networker storage node. Right-Click **Device** > **New Device Properties**, and then enter necessary information for the target device. When complete, mount the device.

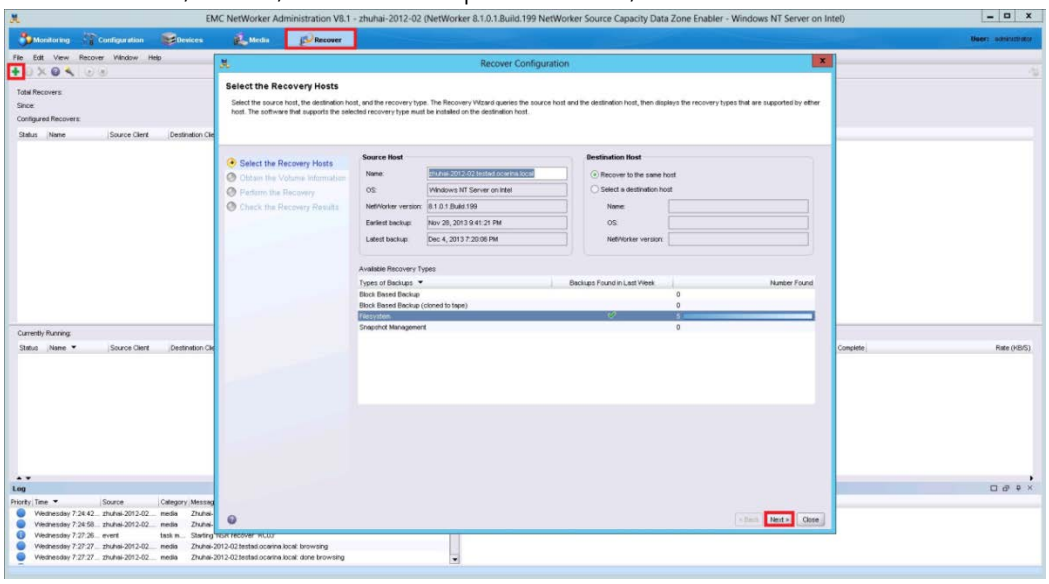


NOTE: Do not label the target device.

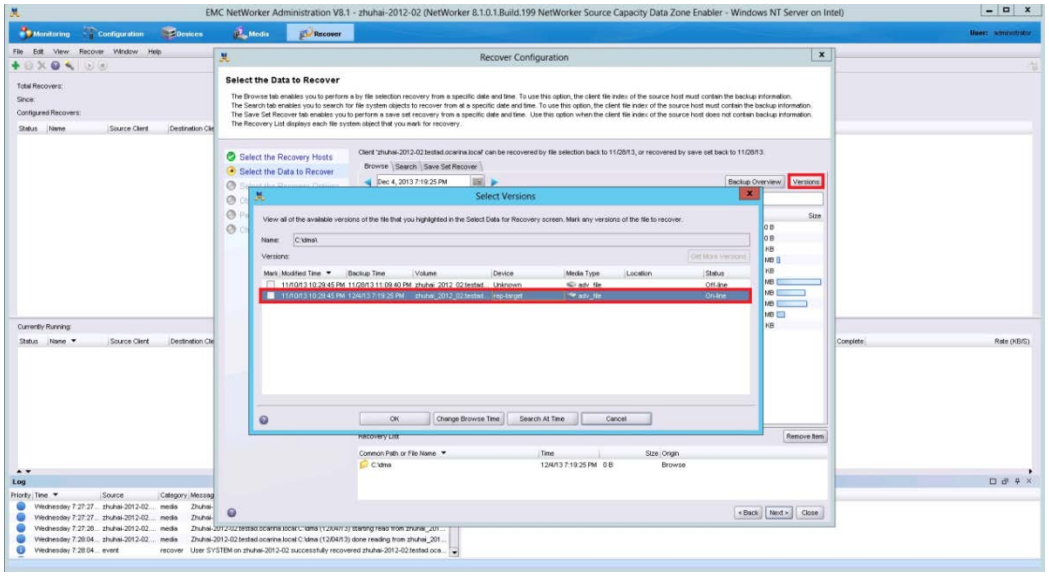
2. Unmount the source container.



3. Go to **Recover**, click **+**, select a backup source host, and click **Next**.

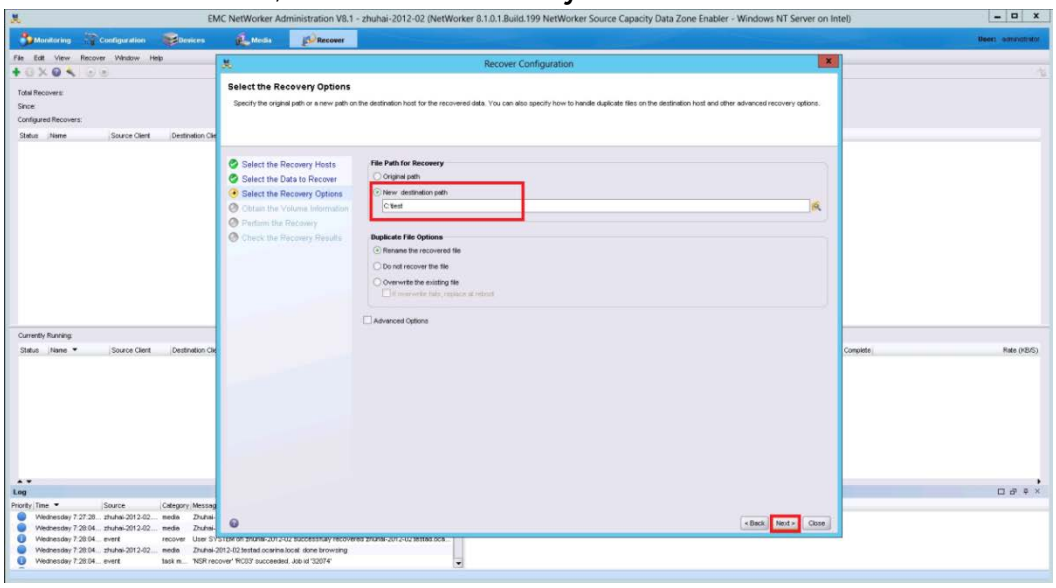


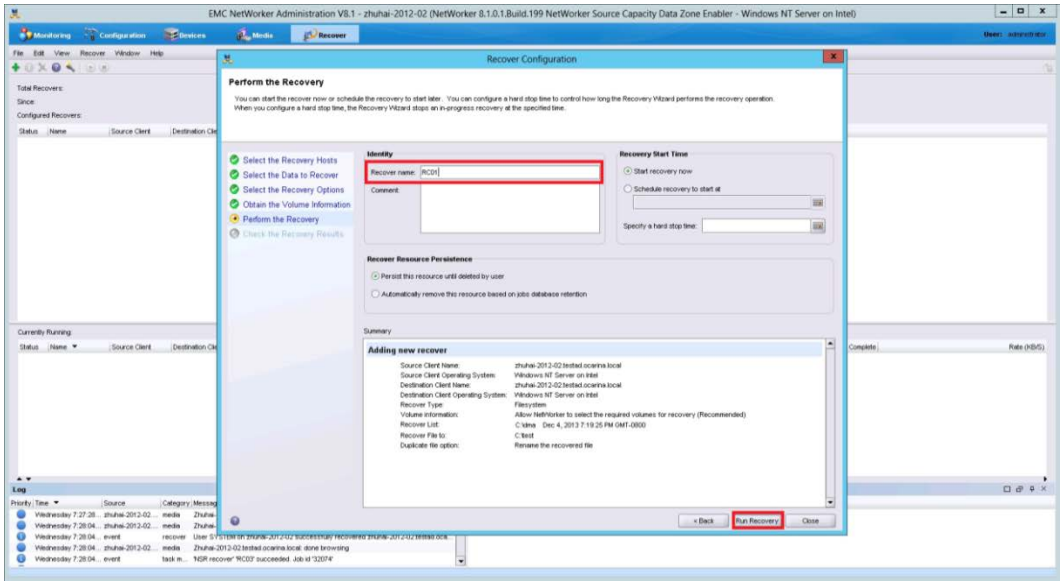
4. Select the data set to recover, click **Versions** to view the **Select Versions** window, select the data, and click **OK**.



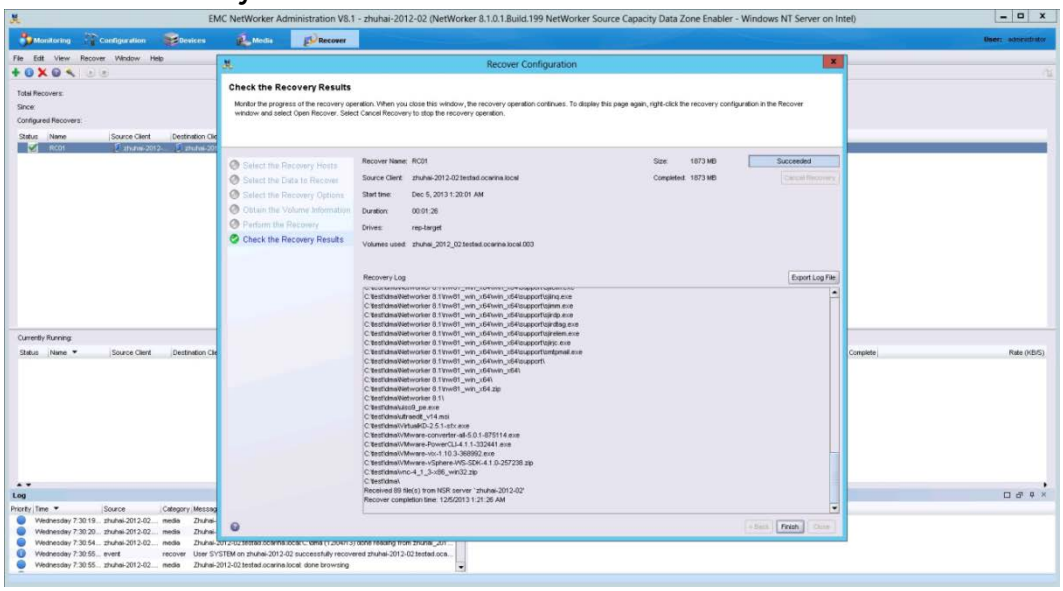
5. Select the **Recovery Options**, choose **Original path**, or enter a new destination path to which to recover data, and click **Next**.

6. Enter a **Recover name**, and click **Run Recovery**.





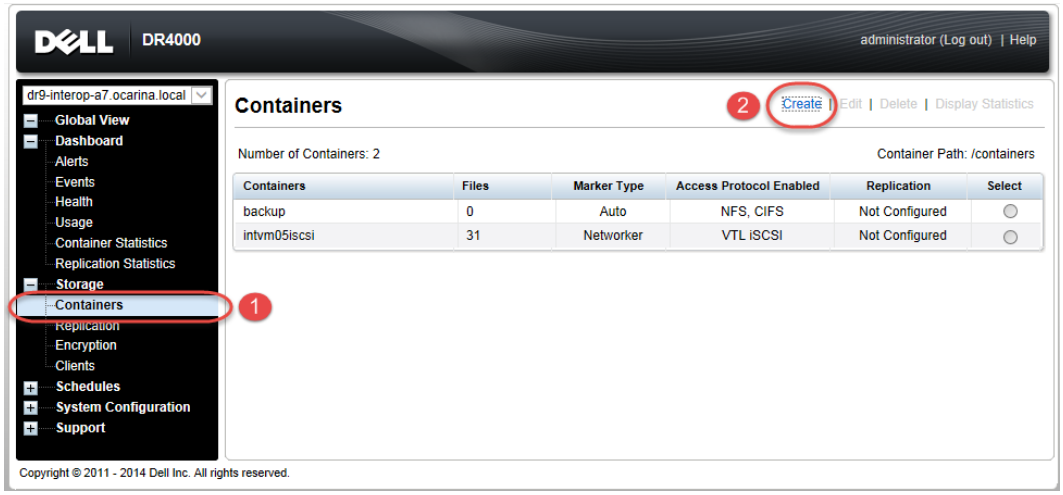
7. Check the **Recovery Results**.



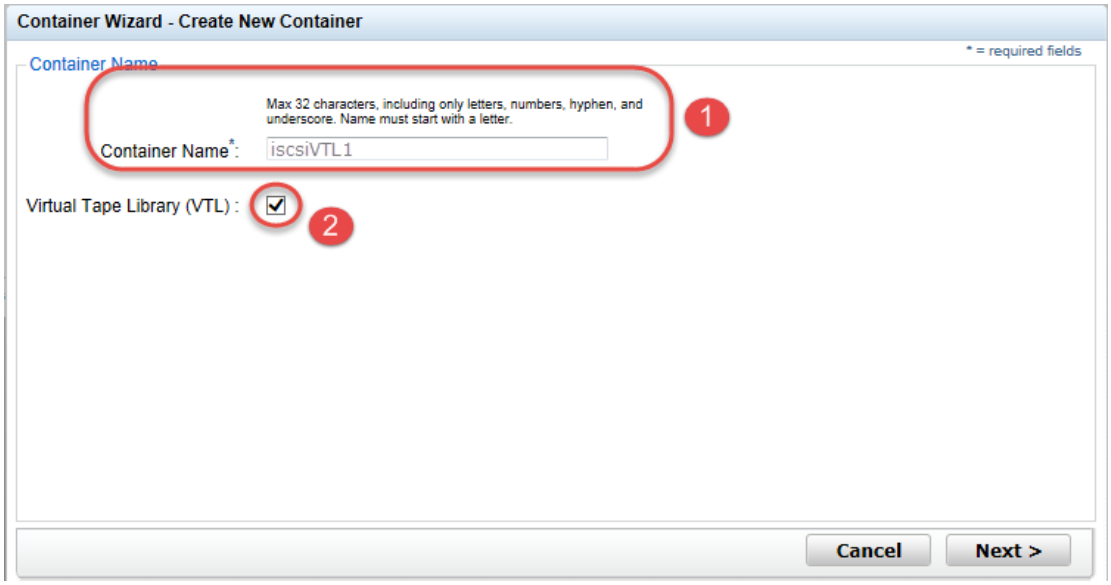
3 Creating and configuring iSCSI target container(s) for Networker

3.1 Creating an iSCSI VTL container for Networker use

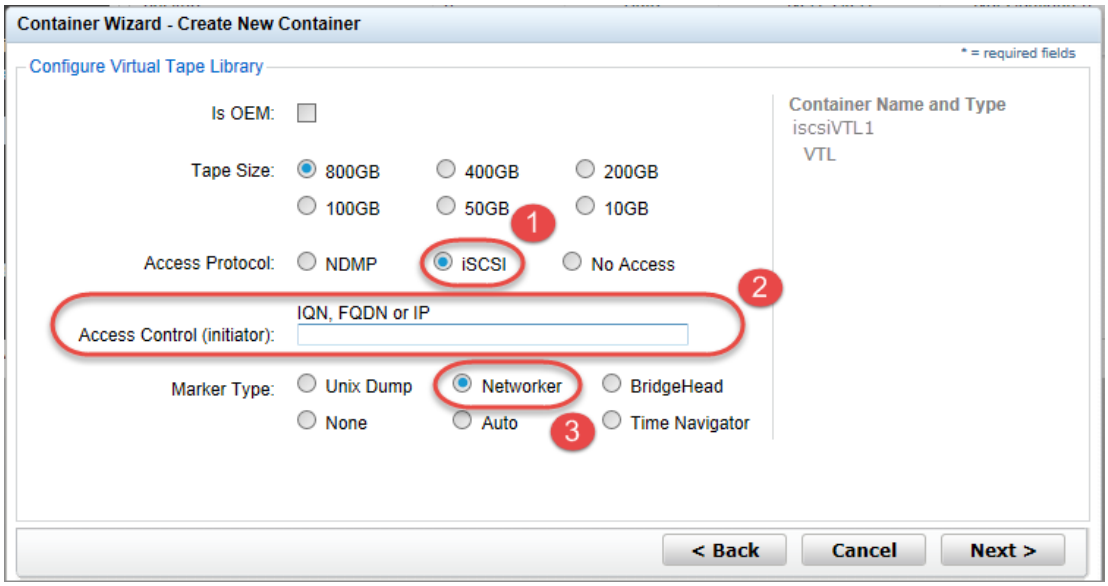
1. Create and export the iSCSI container by selecting **Containers** in the left navigation pane of the DR Series system GUI, and click **Create** at the top of the page.



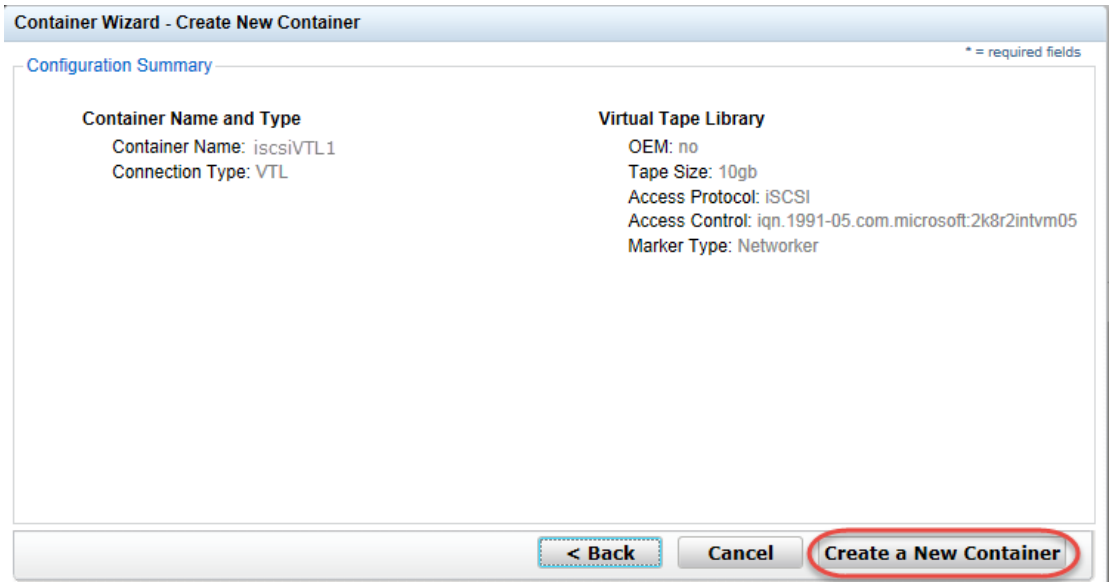
2. Enter a container name and select the **Virtual Tape Library (VTL)** container option. Click **Next**.



3. Select the iSCSI **Access Protocol**. Specify the DMA **Access Control** by providing the storage node / media node IP Address, IQN or FQDN. For Marker Type, select **Networker**. Click **Next**.



4. Click **Create a New Container**.

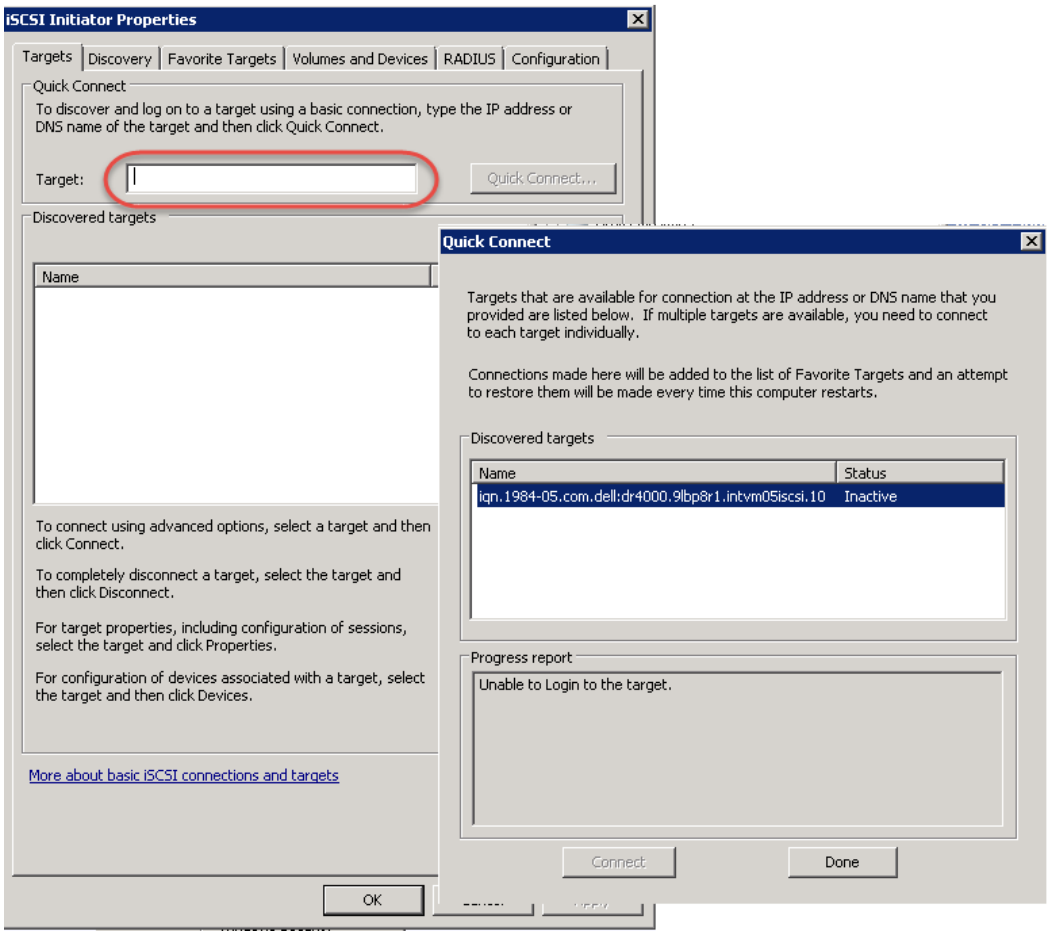


3.1.1 Configuring the iSCSI Networker storage node – Windows

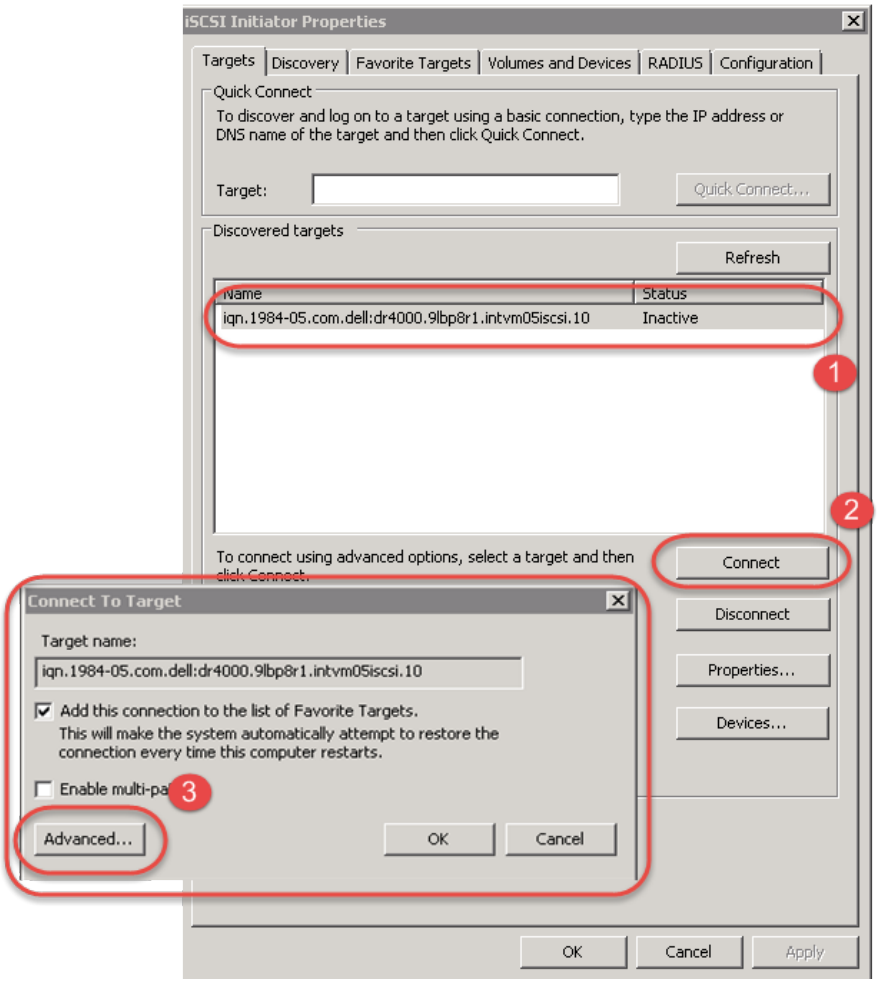
iSCSI initiator configuration is a two-step process, consisting of:

- Target discovery.
- Establishing an iSCSI session with the target using CHAP authentication.

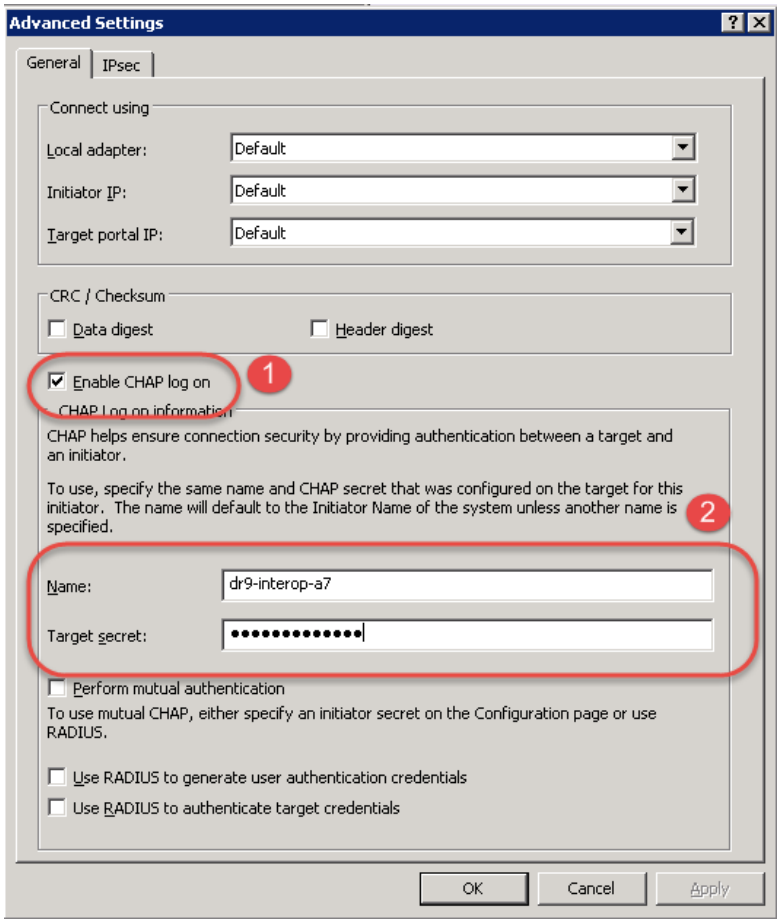
1. Provide the IP or FQN of the DR Series system in the **Target** field. Click **Quick Connect**, which results in target discovery, The Quick Connect dialog box lists all available targets on the DR Series system. At this point, the status will be Inactive. Click **Done** and close the dialog box.



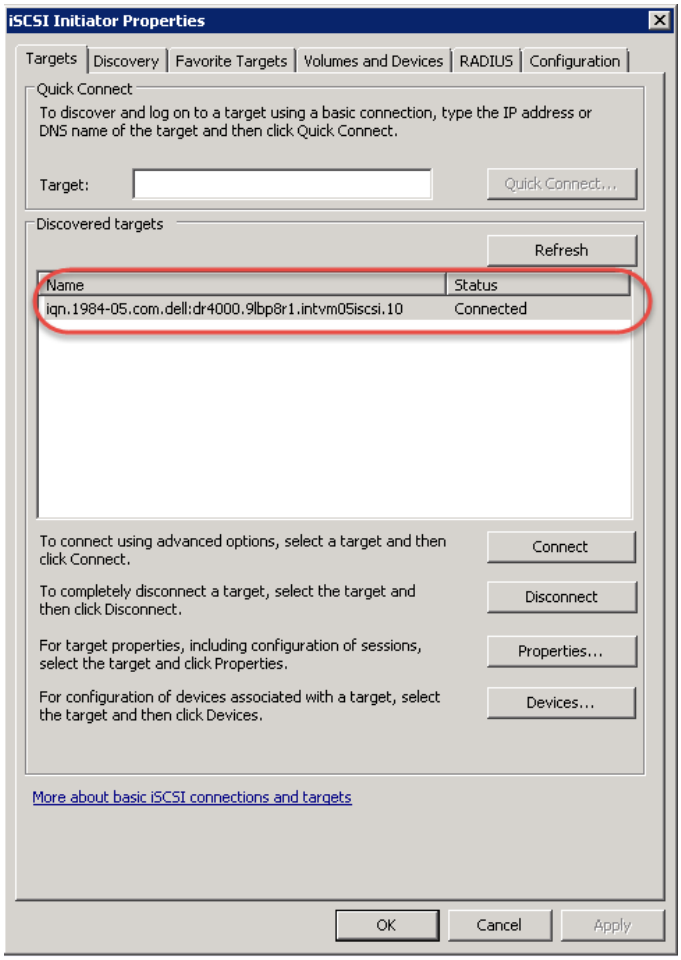
2. Close the dialog box and proceed by selecting the newly discovered target. This target will have an **Inactive Status** as it requires authentication parameters to be provided for iSCSI login. Select the Target from the list, click the **Connect** button, and then in the **Connect to Target** dialog box select the **Advanced** button.



3. In **Advanced Settings**, select to **Enable CHAP log on** and type the **User Name** and **Target Secret / Password**. Select **OK** to save the settings. Refer to *Appendix A* for further details about accounts and credentials.

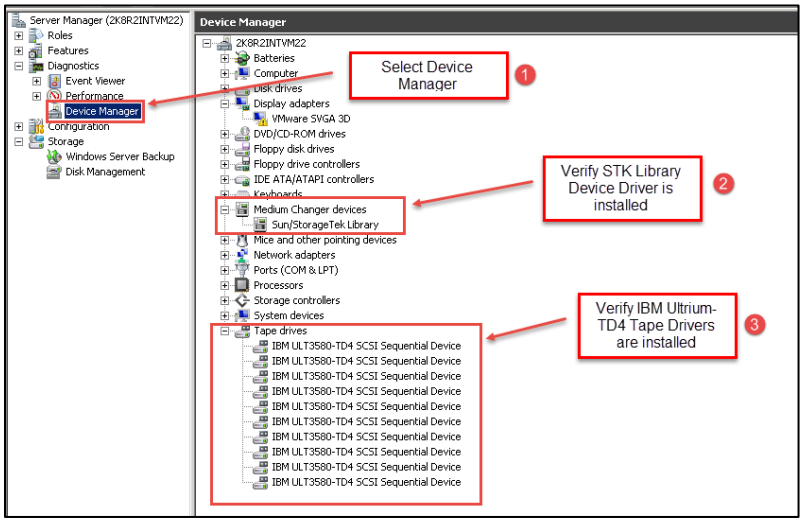


The iSCSI target should now appear as connected and the device discovery can now proceed.



4. Open the **Server Manager Snap-in** and verify that the newly connected devices appear in the **Device Manager**. Verify that the STK Library and IBM Ultrium-TD4 Device Drivers are installed.

Note: (Refer to the link, http://catalog.update.microsoft.com/v7/site/home.aspx for information and assistance in acquiring Microsoft Device Drivers , for example, StorageTek Library Drivers).



3.1.2 Configuring the iSCSI target – Linux

Before you begin this procedure, ensure that the iSCSI initiator is installed (iscsi-initiator-utils). For example:

```
yum install iscsi-initiator-utils ; /etc/init.d/iscsi start
```

To configure the iSCSI target for Linux, follow these steps.

1. Add the CHAP Authentication details for the DR Series system on the Linux Initiator as follows:
   a. Edit /etc/iscsi/iscsid.conf and un-comment the following line:

      ```
      node.session.auth.authmethod = CHAP
      ```

   b. Modify the following lines:

      ```
      # To set a CHAP username and password for initiator
      # authentication by the target(s), uncomment the following lines:
      node.session.auth.username = iscsi_user
      node.session.auth.password = St0r@ge!iscsi
      ```

2. Set the Discovery Target Node(s) by using this command:

   ```
   iscsiadm -m discovery -t st -p <IP or IQN of DR>
   ```

For example:

```
iscsiadm -m discovery -t st -p 10.8.230.108
```

3. Enable logon to the DR Series system iSCSI VTL target(s) by using the following command:

   ```
   iscsiadm -m node --portal <IP or IQN of DR:PORT> --login
   ```

   For example:

   ```
   iscsiadm -m node --portal "10.8.230.108:3260" --login
   ```

4. Display the open session(s) with DR VTL(s) by using the following command:

   ```
   iscsiadm -m session
   ```

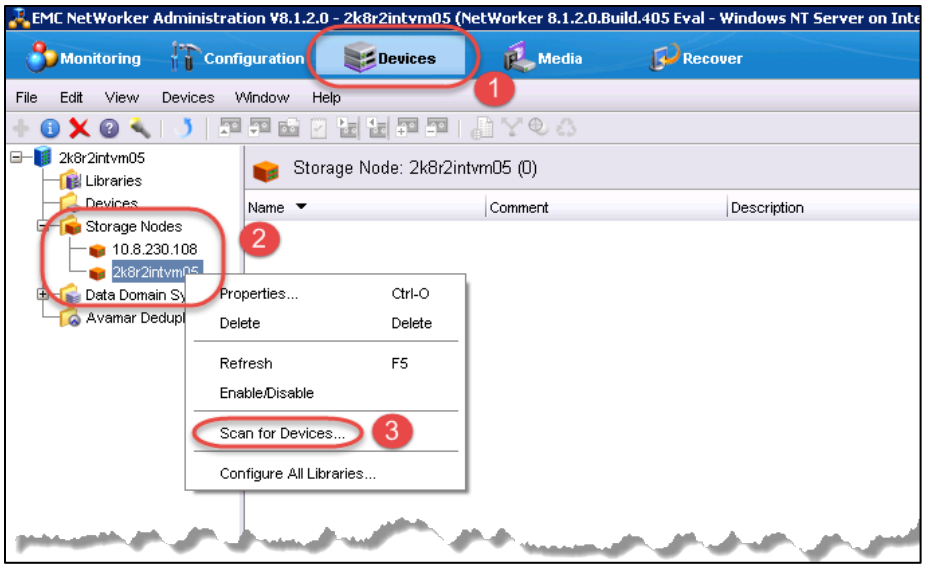
   For example:

   ```
   iscsiadm -m session = tcp: [8] 10.8.230.108:3260,1 iqn.1984-
   05.com.dell:dr4000.3071067.interoprhel52n1.30
   ```

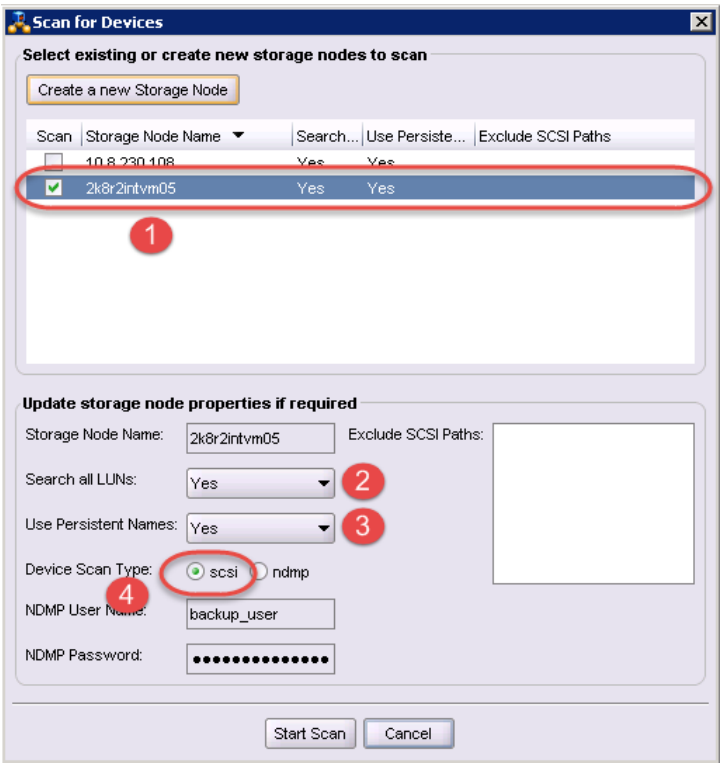
5. Review dmesg or /var/log/messages for details about the tape devices created upon adding the DR Series system iSCSI VTL.

3.2 Setting up Networker to use the newly created iSCSI VTL

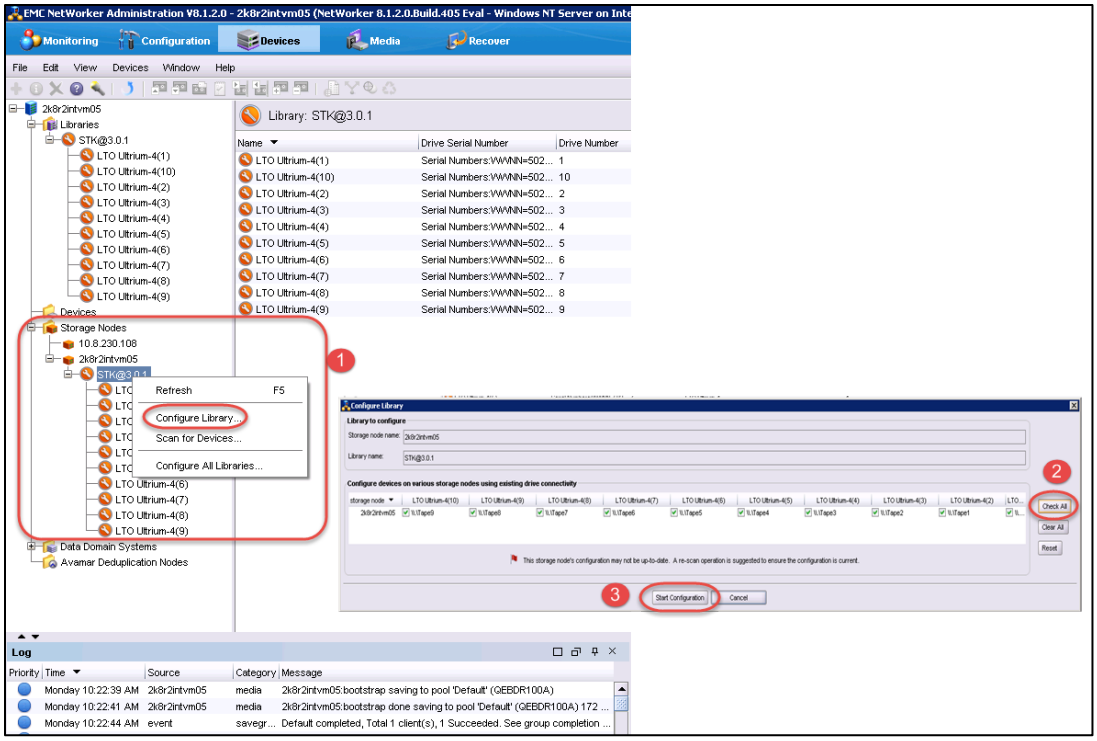
1. Access the **Devices** menu within the Networker Administration interface. Select the Storage Node that has had the NDMP VTL configured for access. Select to **Scan for Devices**.



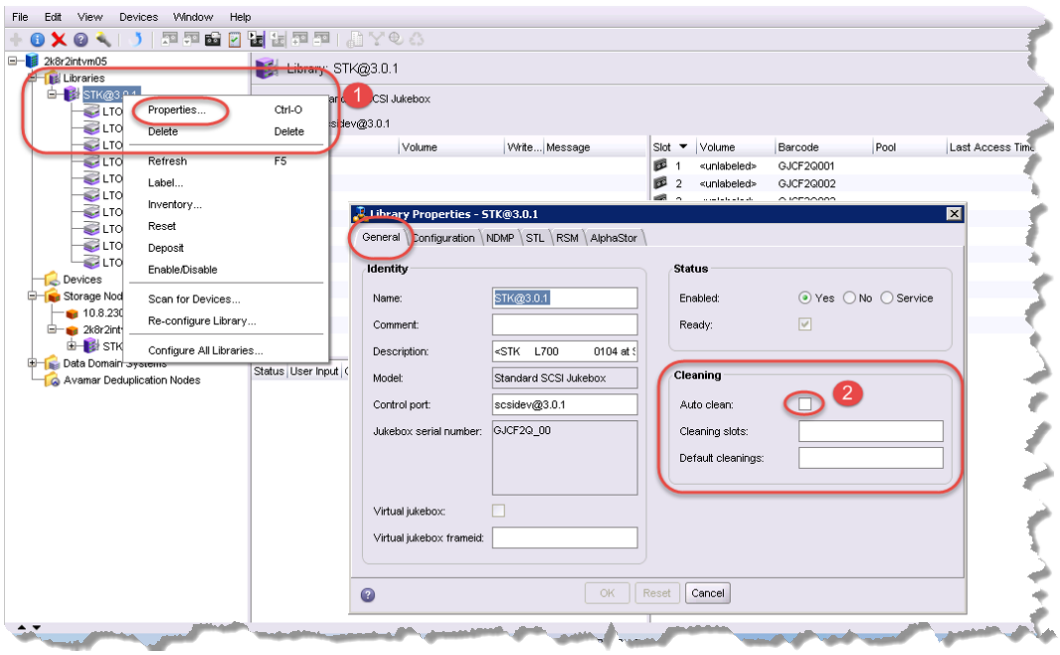
2. In the **Scan for Device** dialog box, select the appropriate storage node with the settings to **Search all LUNs**, **Use Persistent Names** and **Device Scan Type** of **scsi.**



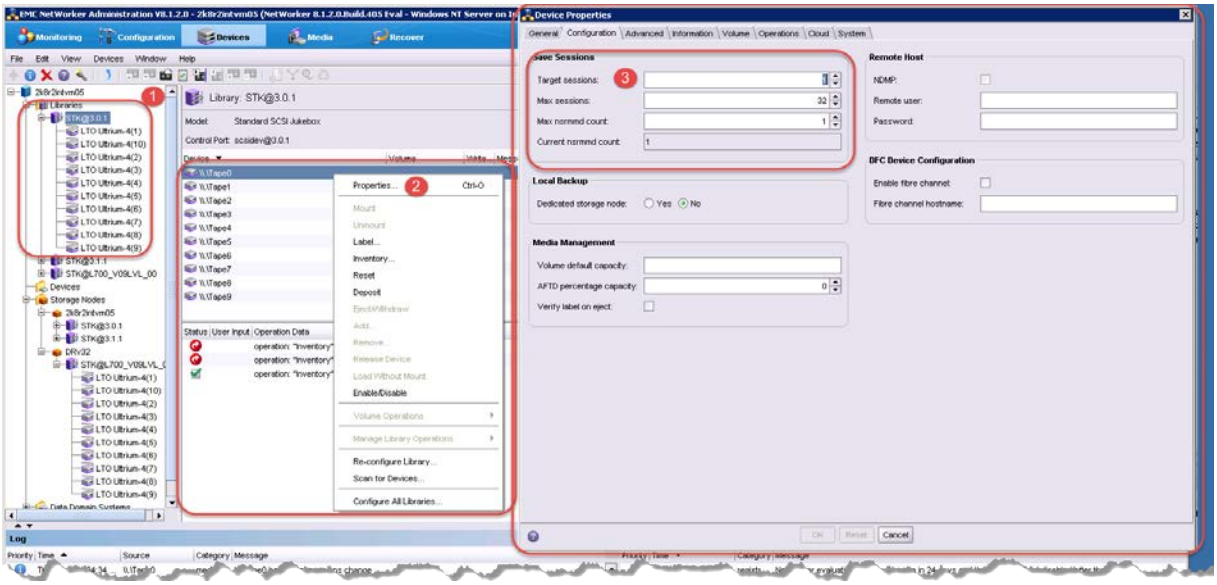
3. After the device scans, the iSCSI VTL should now appear and must be configured for use. Select the library within the **Storage Nodes** navigation tree and proceed with the **Configure Library** option. In the **Configure Library** dialog box, **Check All** drives and click **Start Configuration**.



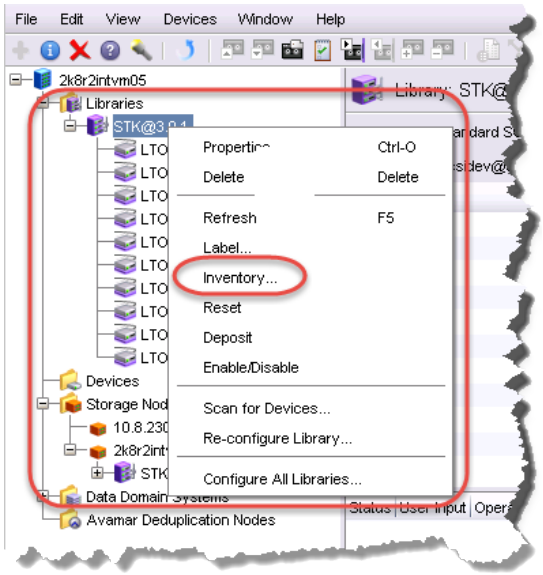
4. The VTL should now show up ready for use. By default, the cleaning option is enabled, which must be disabled. Within the navigation tree, select the Library and **Properties** option. In the dialog box, disable the **Auto-clean** option, and omit the default slot and cleanings settings. Click **OK** to save the changes.



5. After the library has been configured, the individual tape drives must be configured so that they service only one target session at any given time. Multiplexing to virtual tape drives has an adverse effect on deduplication and thus requires that each drive only handle a single target session.



6. Conduct a full inventory of the library.

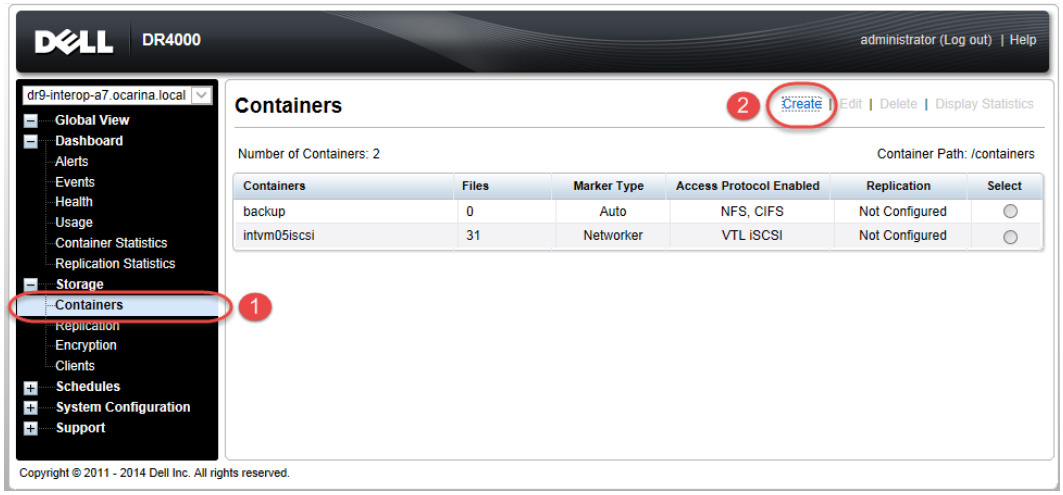


7. Label all the media with labels and place them in their respective media pools for use.

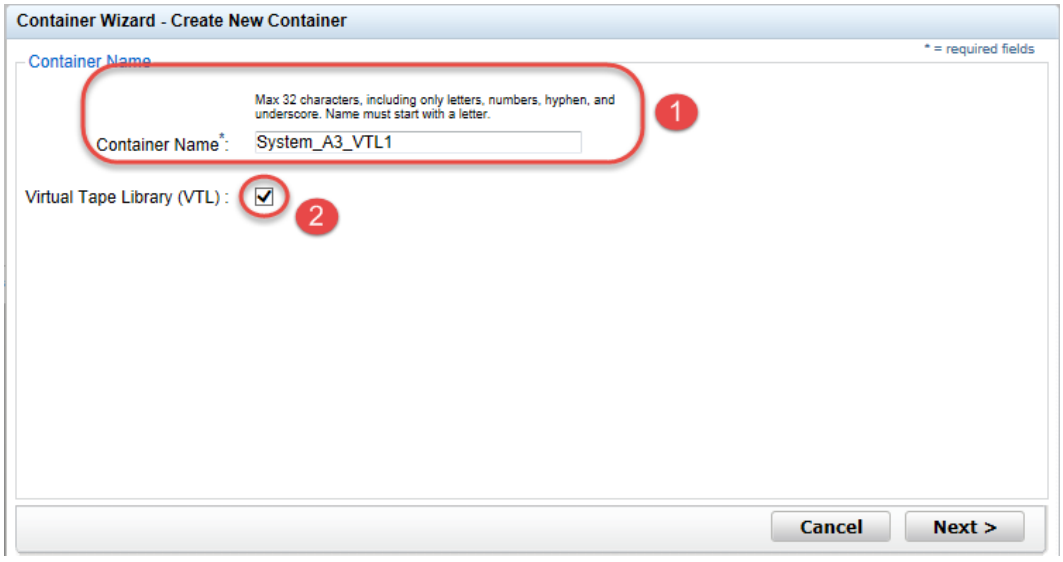
4 Creating and configuring NDMP target container(s) for Networker

4.1 Creating the NDMP VTL container for Networker use

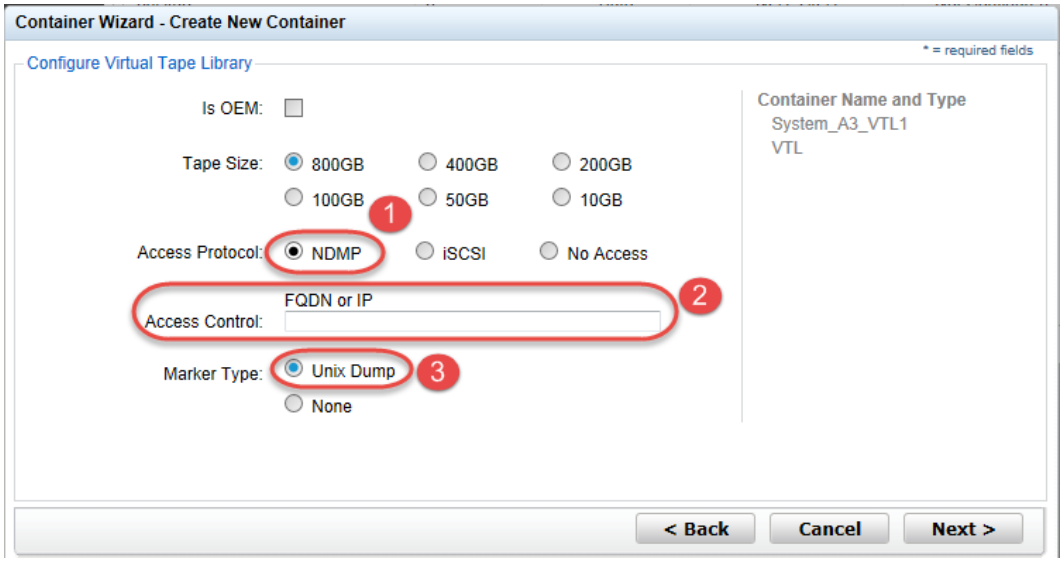
1. Create and export the iSCSI container by selecting **Containers** in the navigation area of the GUI, and then clicking **Create** at the top of the page.



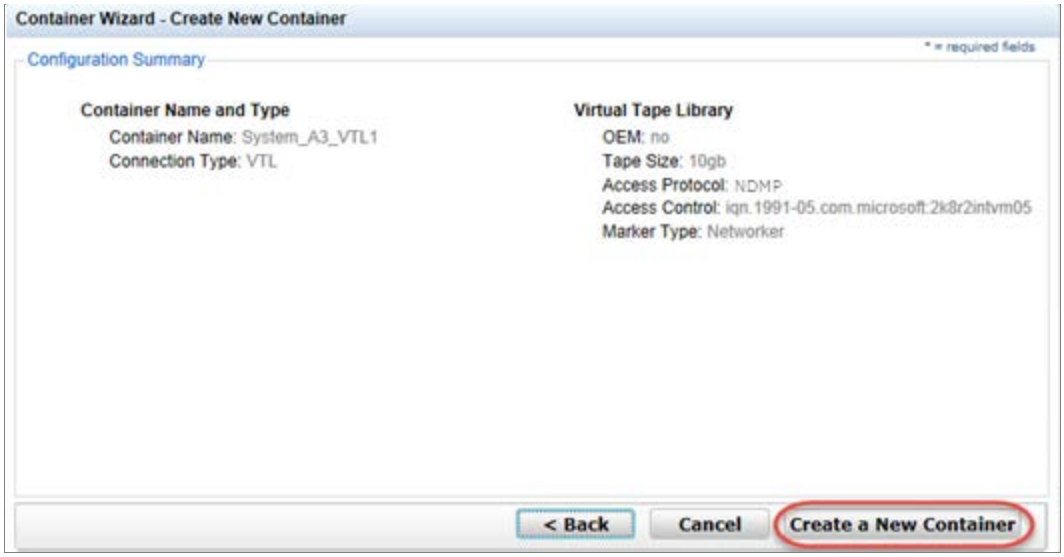
2. In the **Create New Container** wizard, enter the container name, select the **Virtual Tape Library (VTL)** container option, and click **Next**.



3. Select the NDMP **Access Protocol**. Specify the DMA **Access Control** information by providing the storage node or, media node IP Address or FQDN. Select the Marker Type as **Unix Dump** and click **Next.**

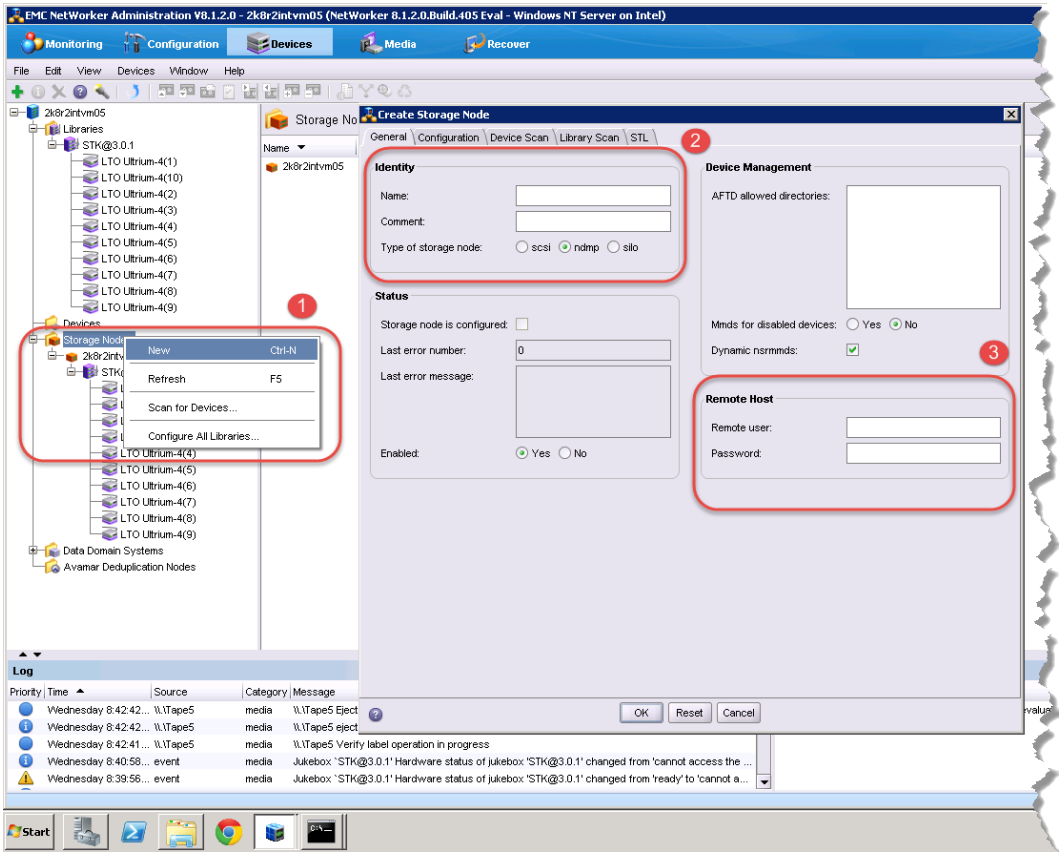


4. Finalize the VTL creation request by clicking **Create a New Container**.

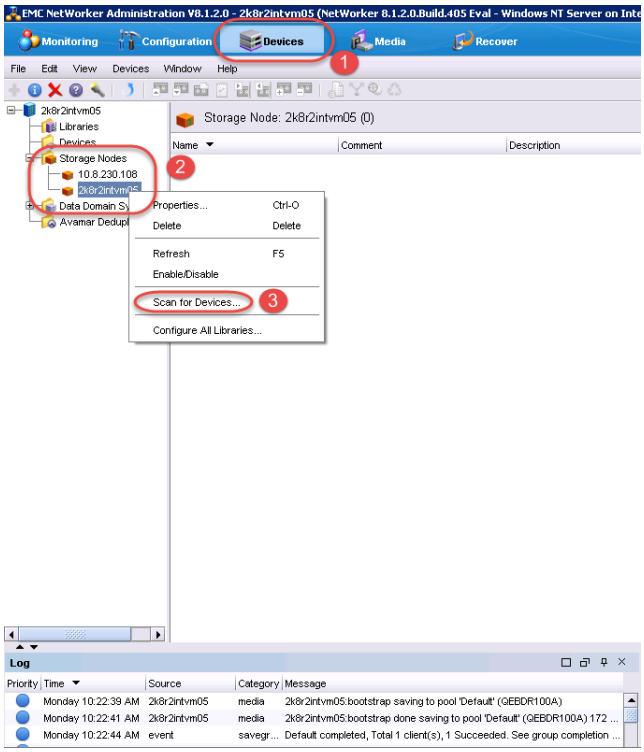


4.2 Configuring Networker to use the newly created NDMP VTL

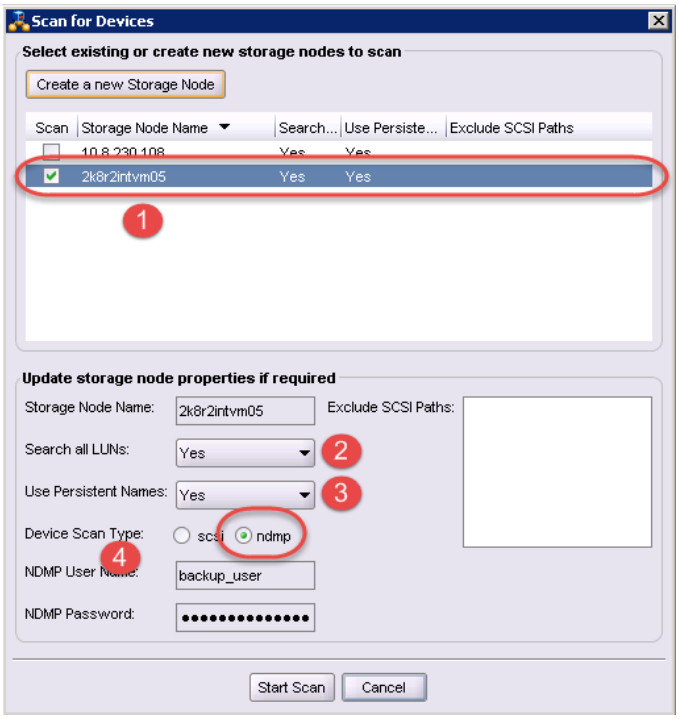
1. Add the DR Series system as a storage node via NDMP.
   a. Navigate to the Devices menu, select the **Storage Nodes** Sub-Tree object within the EMC Networker navigation pane, and add a new storage node.
   b. In the **Create Storage Node** window enter the name of the node (this must be resolvable via DNS or host file resolution). Provide the logon credentials for the ndmp user account on the DR Series system.



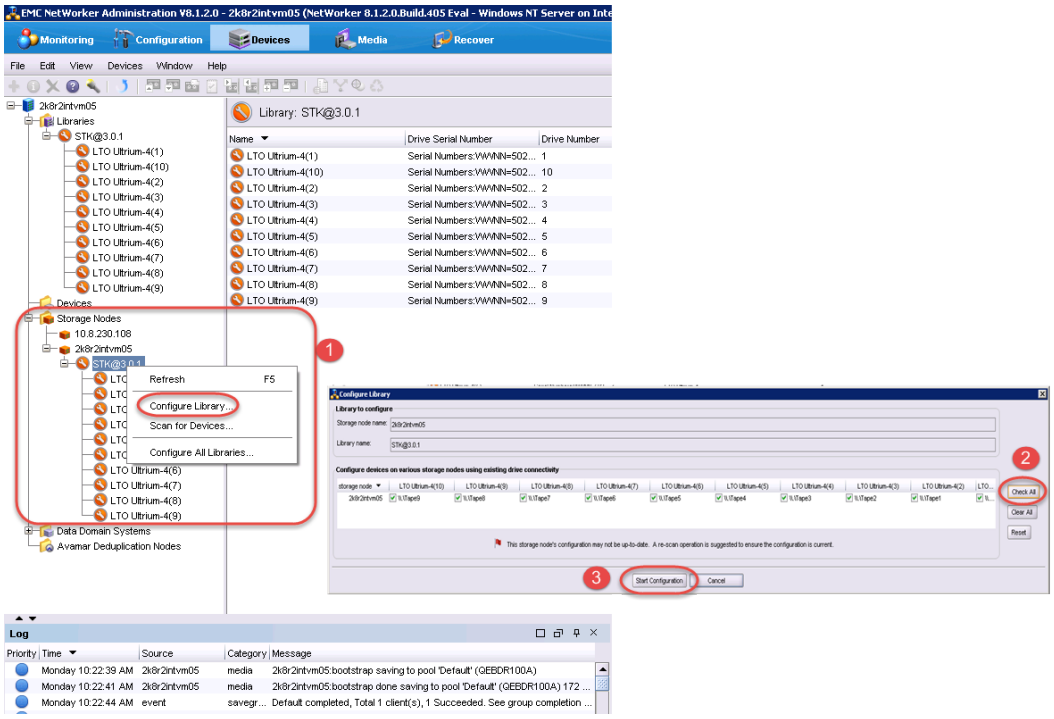
2. Access the **Devices** menu within the Networker Administration interface. Select the Storage Node that has the NDMP VTL configured for access. Select to **Scan for Devices**.



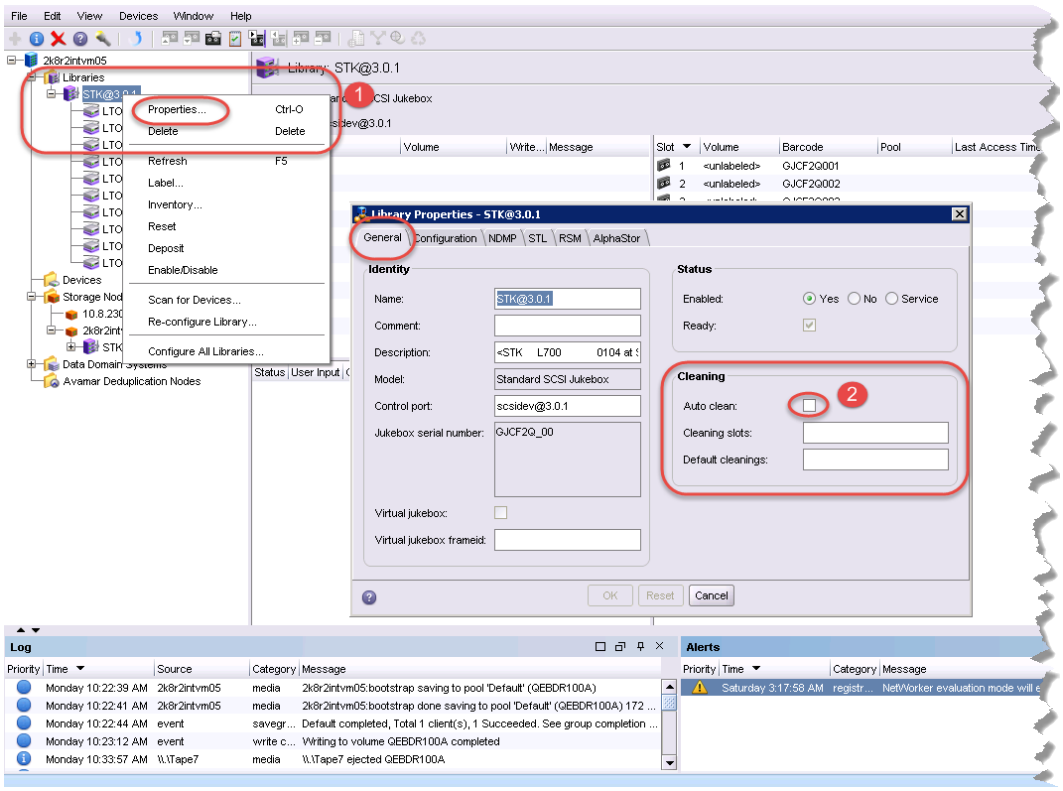
3. In the **Scan for Device** dialog box select the appropriate storage node with the settings to **Search all LUNs**, **Use Persistent Names** and **Device Scan Type** of **ndmp.**



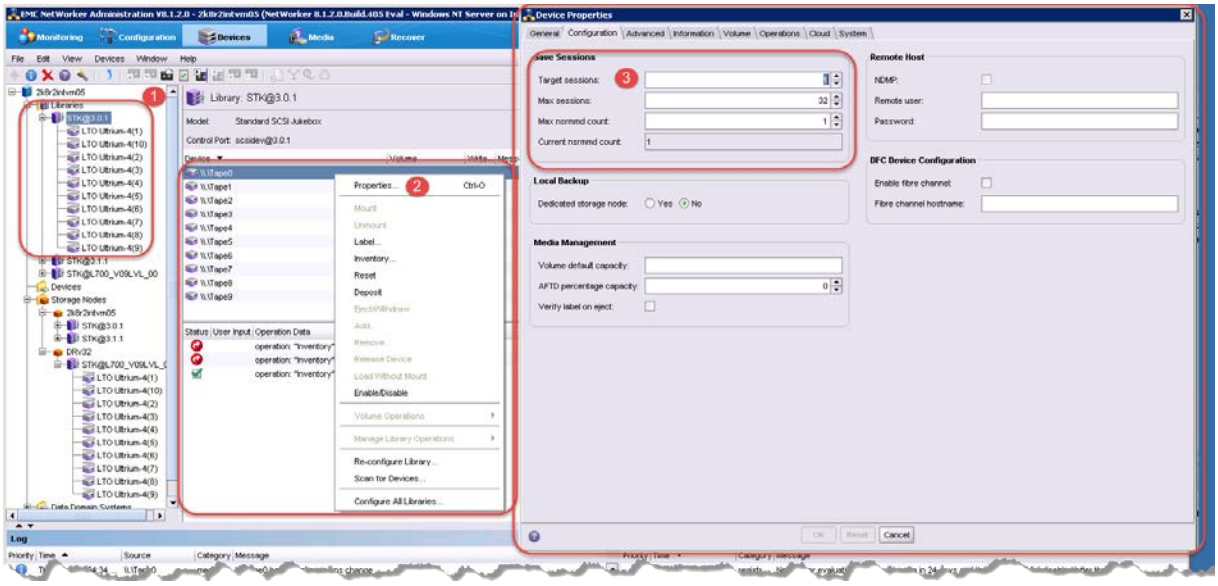
4. After the device scan, the NDMP VTL should now appear and can be configured for use. Select the library within the storage nodes navigation tree and proceed with the **Configure Library** option. In the **Configure Library** dialog box, **Check All** drives and click the **Start Configuration** button.



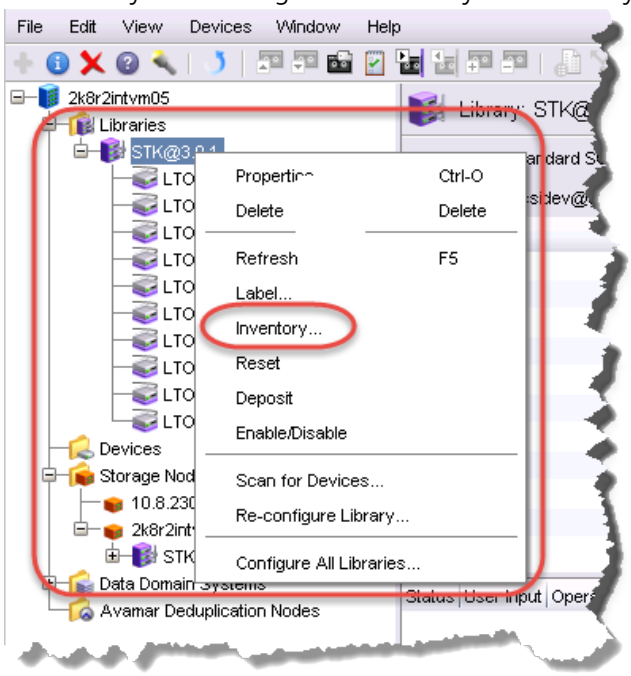
5. The VTL should now appear ready for use. By default, the cleaning option is enabled, and it must be disabled. Within the navigation tree, select the Library, and then select the **Properties** option. In the dialog box, disable the **Auto-clean** option and omit the default slot and cleanings settings. Click **OK** to save the changes.



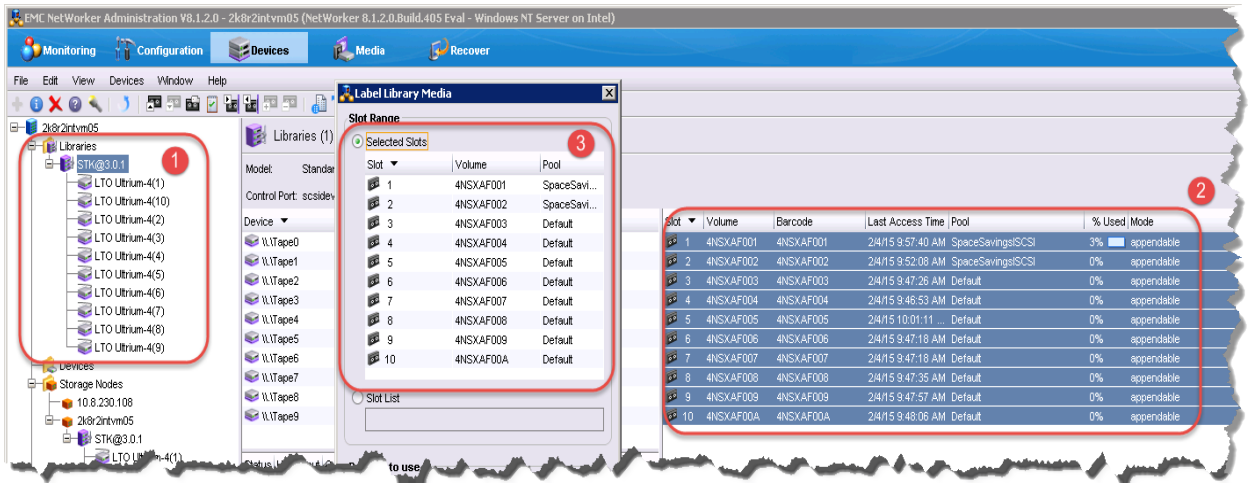
6. After the library has been configured, the individual tape drives must be configured so that they service only one target session at any given time. Multiplexing to virtual tape drives has an adverse effect on deduplication and thus requires that each drive only handle a single target session.



7. Proceed by conducting a full inventory of the library.



8. Label all the media and place them in their respective media pools for use.

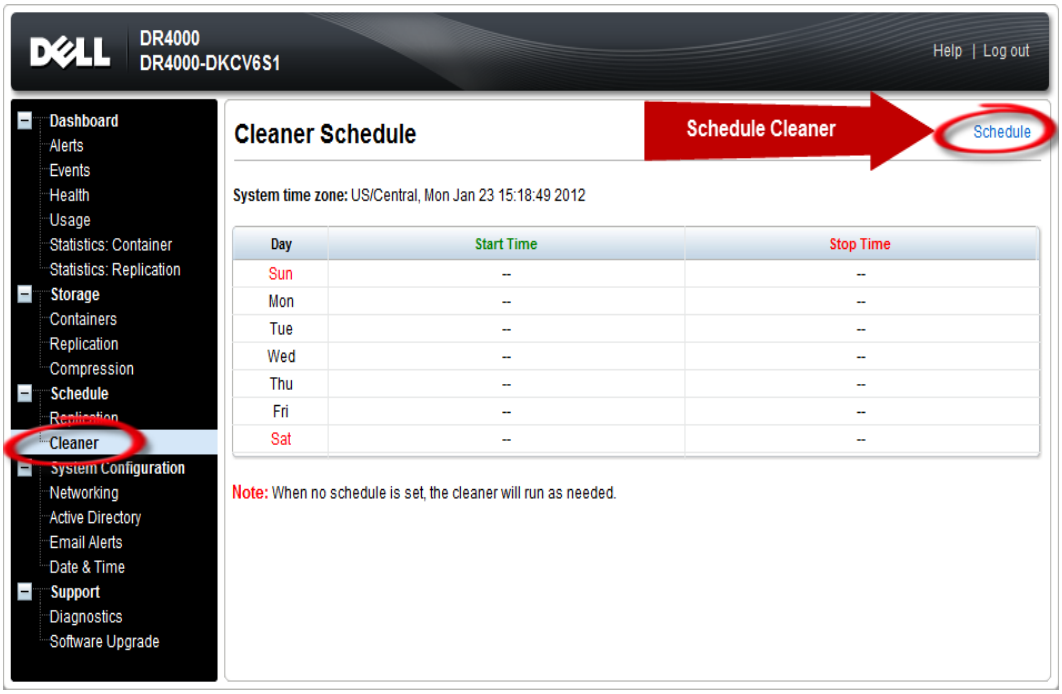


5 Setting up the DR Series system cleaner

Performing scheduled disk space reclamation operations are recommended as a method for recovering disk space from system containers in which files are deleted, as a result of deduplication.

The cleaner runs during idle time. If your workflow does not have a sufficient amount of idle time on a daily basis, then you should consider scheduling the cleaner to force it to run during a scheduled time.

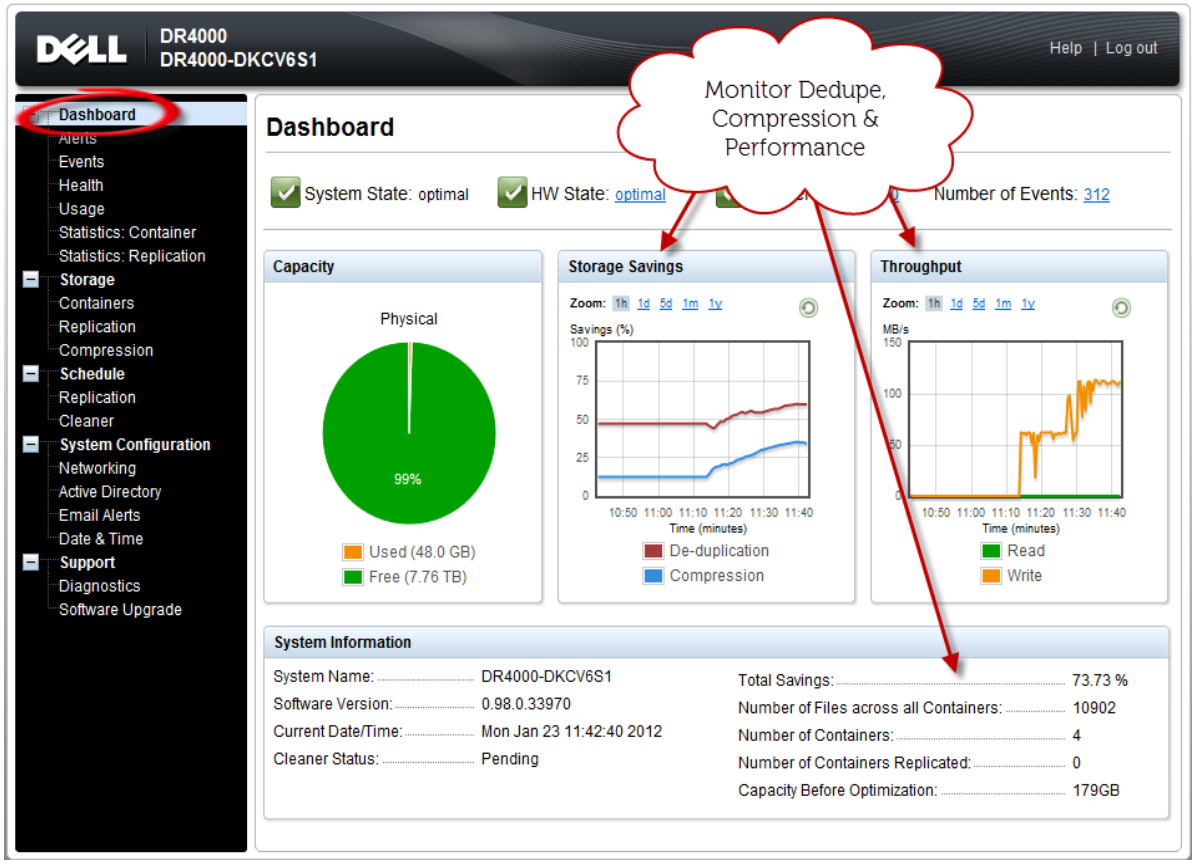
If necessary, you can perform the procedure shown in the following screenshot to force the cleaner to run. After all the backup jobs are set up, the DR Series system cleaner can be scheduled. The DR Series system cleaner should run at least 40 hours per week when backups are not taking place, and generally after a backup job has completed.



6 Monitoring deduplication, compression, and performance

After backup jobs have run, the DR Series system tracks capacity, storage savings, and throughput on the DR Series system dashboard. This information is valuable in understanding the benefits of the DR Series system.

Note: Deduplication ratios increase over time. It is not uncommon to see a 2-4x reduction (25-50% total savings) on the initial backup. As additional full backup jobs are completed, the ratios will increase. Backup jobs with a 12-week retention will average a 15x ratio, in most cases.



A Managing VTL protocol accounts and credentials

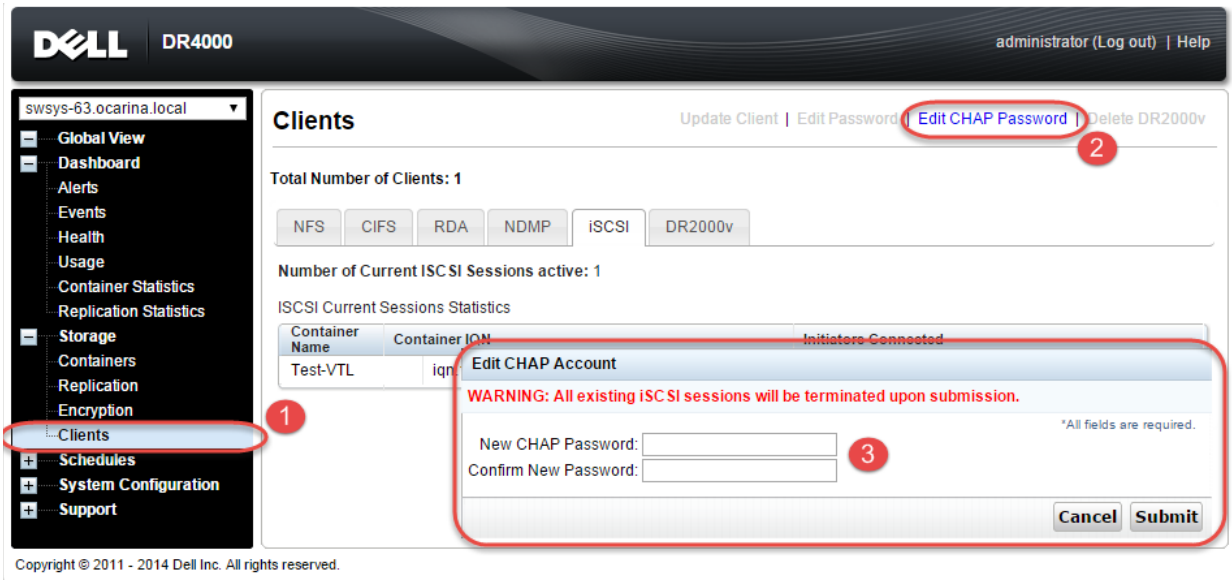
A.1 iSCSI account details and management

By default the iSCSI Username will be the **hostname** of the DR and can be confirmed by reviewing the output of the `iscsi –account --user` command. For example:

```
>iscsi --account --user

user: dr9-interop-a7
```

The default iSCSI Password is "**St0r@ge!iscsi**". This can be modified by navigating to the **Clients** Navigation option and selecting the **iSCSI** tab under the **Clients** menu. Select the the **Edit CHAP Password** and fill in the new password as needed.

IMPORTANT NOTE: iSCSI CHAP Passwords must be between 12 and 16 characters long.

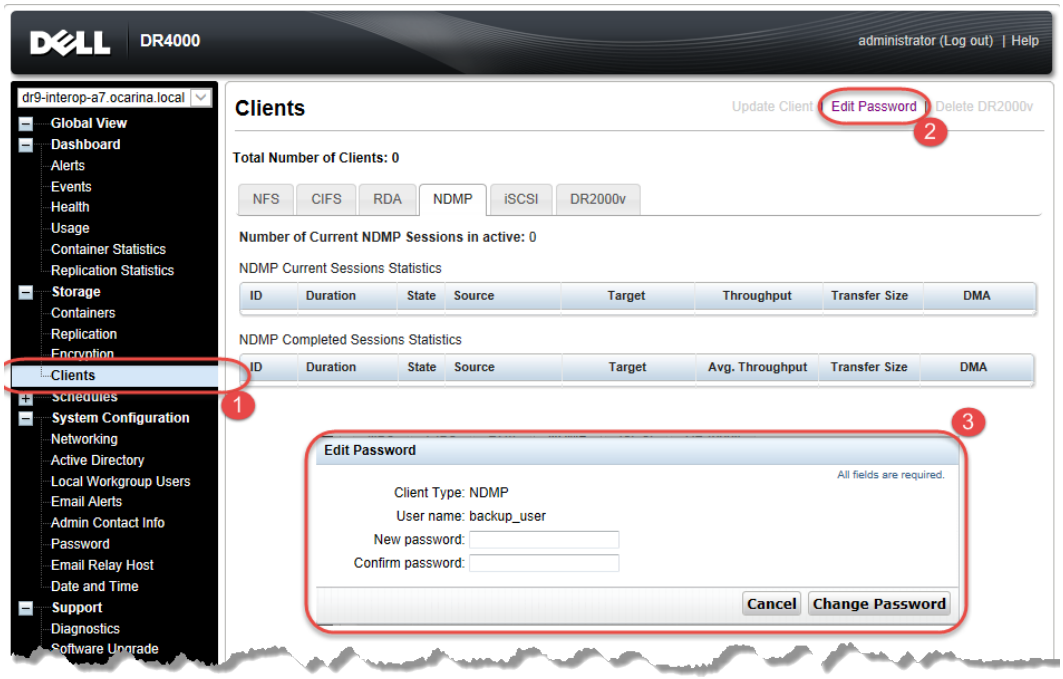


Alternatively, you may also use the "iscsi –setpassword" cli tool to change the iSCSI CHAP Password setting as shown in the following example:

```
> iscsi --setpassword

WARNING: All existing iSCSI sessions will be terminated!

Do you want to continue? (Yes/no) [n]?

Enter new CHAP password:############

Re-type CHAP password:############
```

A.2 NDMP account details and management

The default username for the NDMP service is "**backup_user**" and can be confirmed using the web UI interface:



Or, by using the following commands:

```
ndmp –show command:

administrator@dr9-interop-a7 > ndmp --show

NDMP User:      backup_user

NDMP Port:      10000
```

The default password is St0r@ge! and can be modified by running the `ndmp –setpassword` command:

```
> ndmp --setpassword

Enter new NDMP password:#########

Re-type NDMP password:#########

NDMP password successfully updated.
```

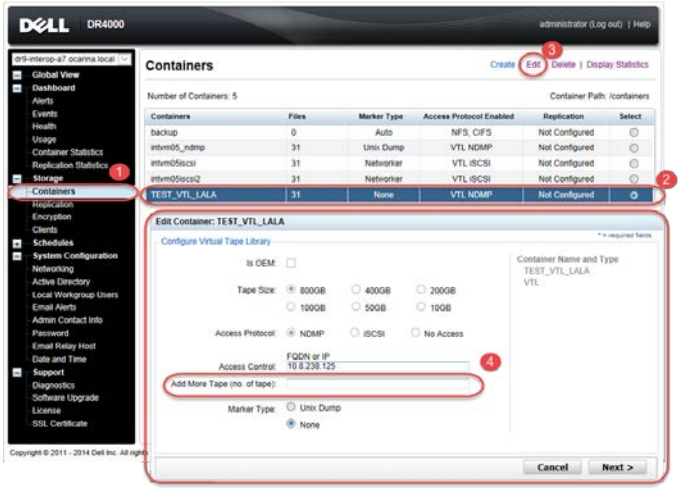
A.3 VTL default account summary table

Service	Account	Default Credentials	CLI Modifier
NDMP	backup_user	St0r@ge!	ndmp --setpassword
iSCSI	<Appliance Hostname>	St0r@ge!iscsi	iscsi –setpassword

B Adding VTL media

B.1 Adding the VTL media to the container

To add media to an existing VTL container navigate to the **Containers** menu option. Select and edit the target VTL container. Use the resulting dialog box field **Add More Tape (no of Tape)** field to input the number of tapes to add to the VTL container.



Alternatively you may also use the `"vtl –create_carts"` cli command for this operation:

```
> vtl --create_carts --name TEST_VTL_LALA --tapes 10
Created 10 cartridges
```

B.1.1 VTL media count guidelines

Type	Capacity	Max number of Tapes supported
LTO-4	800GiB	2000
LTO-3	400GiB	4000
LTO-2	200GiB	8000
LTO-1	100Gib	10000
LTO-1	50Gib	10000
LTO-1	10GiB	10000

B.2 Updating Networker to identify newly added VTL media

After the VTL media has been added to the target VTL container NetWorker must now be updated to be able to use media. Select the VTL and conduct an inventory update. Input the new range created (e.g. 10 new tapes would result in 20 Slots) and select the option to reinitialize the library.