

# NetWorker Installation, Configuration and Administration Lab Guide

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## Lab Introduction

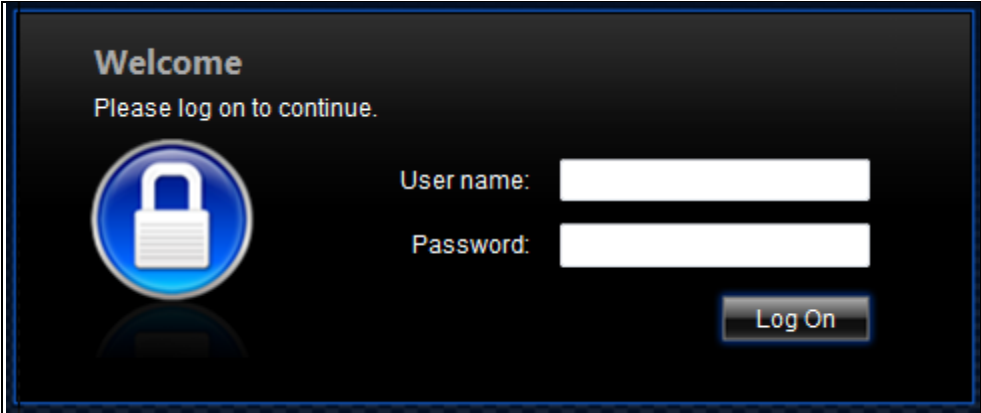
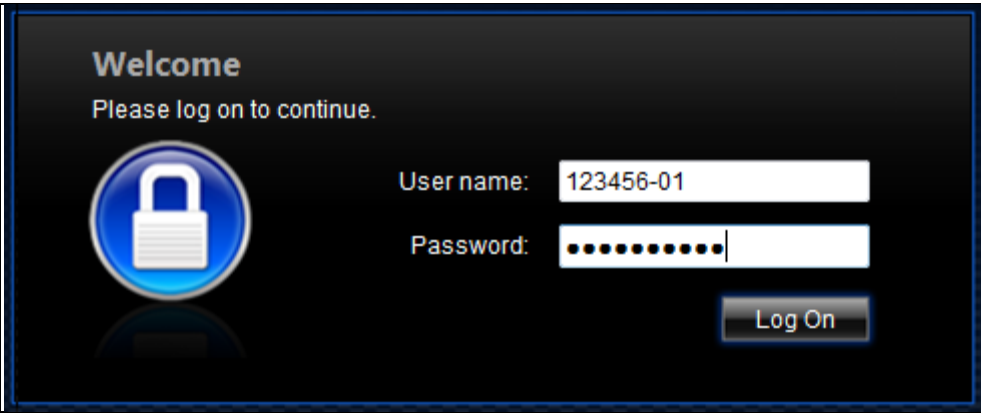
<b>Purpose:</b>	The lab exercises contained in this guide give you an opportunity to reinforce the information you are learning in the course. The lab exercises are designed to be run in a test lab environment on the NetWorker training lab system as described below. Some of the lab exercises may make changes to the system. For this reason, do <i>not</i> attempt to run the lab exercises on a production system.
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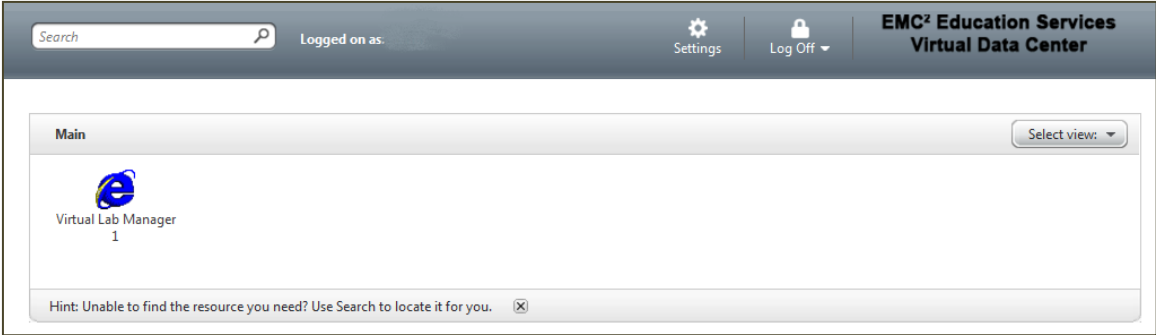
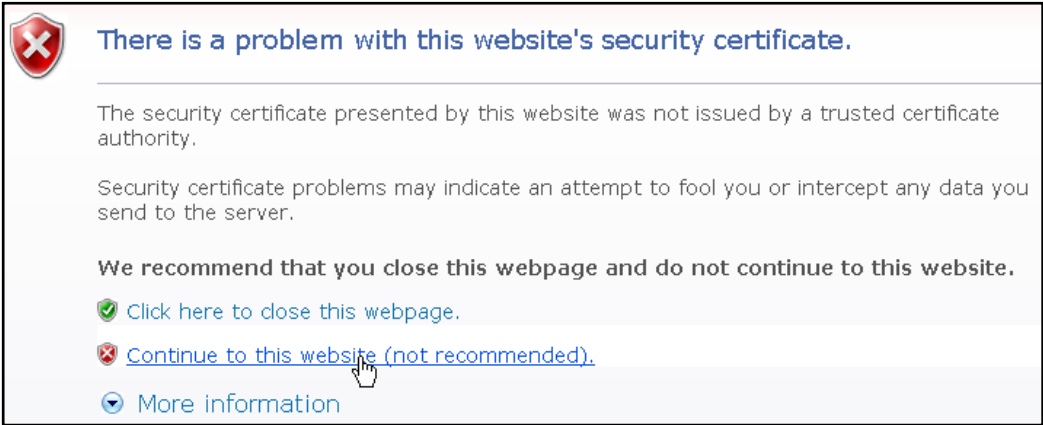
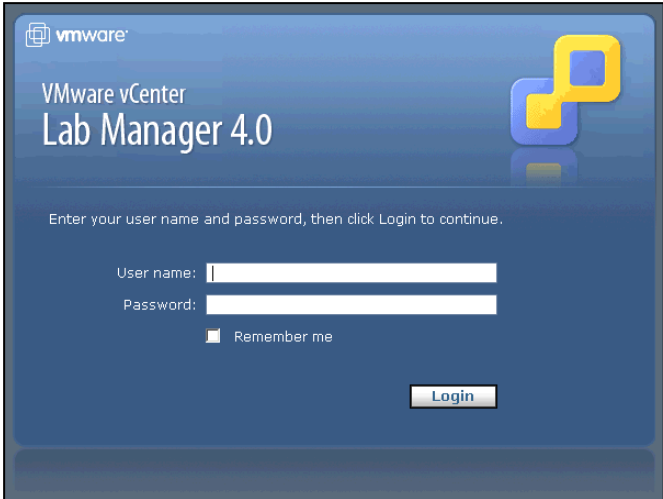
<b>Lab Environment:</b>	<p>You will be using a Virtual Data Center (VDC) environment in Lab Manager to perform the EMC NetWorker Installation, Configuration and Administration course lab exercises.</p> <p>Each student works in their own VDC configuration, accessed with an assigned VDC/Lab Manager username and password. The NetWorker Installation, Configuration and Administration Lab Manager configuration consists of these 5 virtual machines:</p> <ul style="list-style-type: none"><li>• nwwindows - This will be your primary Windows workstation for the labs.</li><li>• nwlinux – This is your Linux host for the labs.</li><li>• dc - This is a domain controller and DNS for your configuration.</li><li>• winclient – This will be your Windows client.</li><li>• vtl – Virtual Tape Library</li></ul> <p>Additionally there is a physical Data Domain system that will be used for some labs. The username and login information for this system will be provided in the labs that require it.</p>
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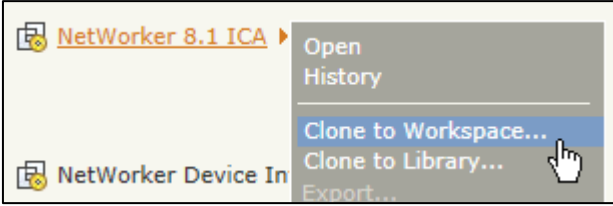
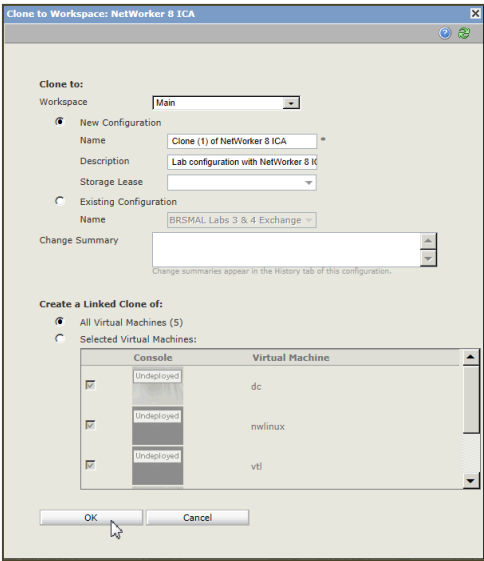
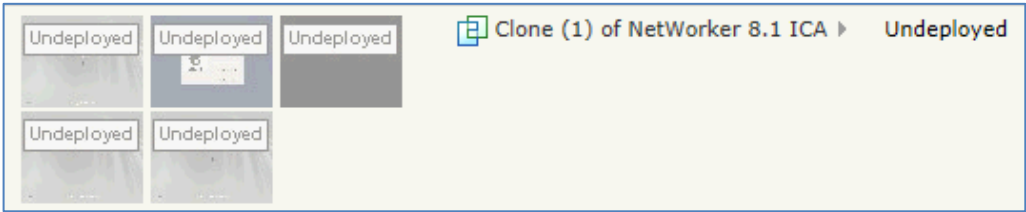
<b>Important</b>	The labs contain tasks and the solutions to those tasks. Many screenshots are presented which contain information showing how to perform a task. However, the actual information in the screenshot may or may not exactly reflect your particular lab environment. Thus, <b>you should not simply type what you see in a screenshot and assume that it will work.</b> Always consider the task that is being performed and determine for your lab environment whether the steps shown to perform the task are applicable.
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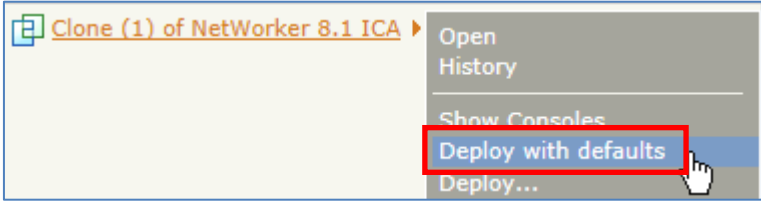
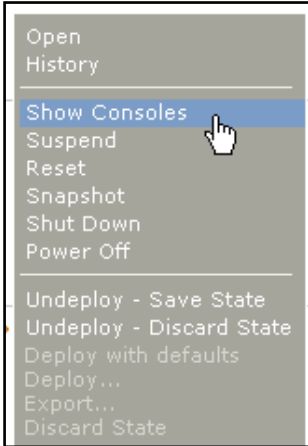

<b>References:</b>	EMC NetWorker Installation, Configuration and Administration course student guide EMC NetWorker Administration Guide
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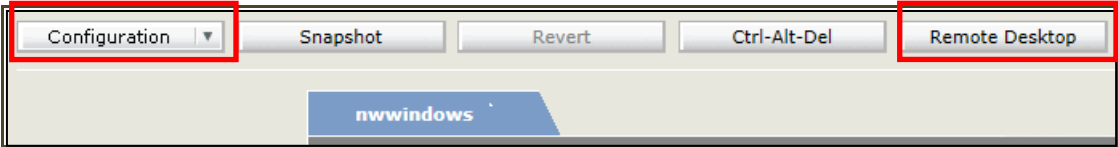
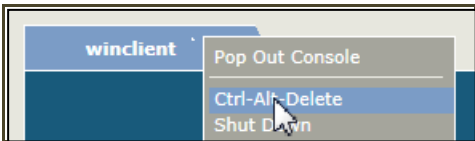
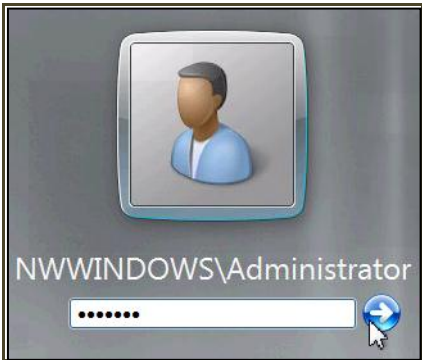
# Logging into the Lab Environment

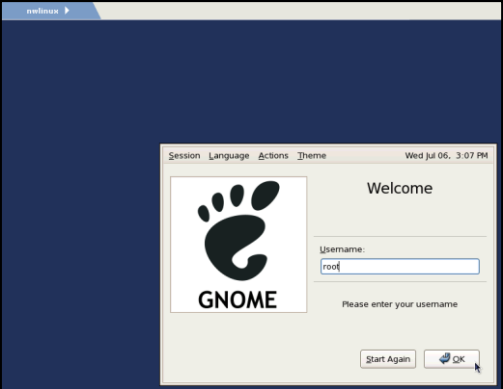
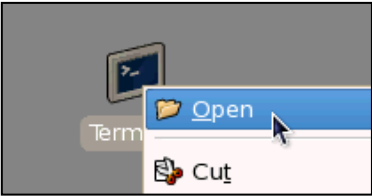

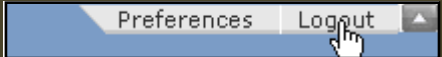
Step	Action
1	<p>Follow these steps to log into the EMC NetWorker ICA VDC lab environment.</p> <p>Log in to a Windows classroom computer with the login information provided by your instructor.</p>
2	<p>Open Microsoft Internet Explorer and go to the URL, <a href="https://vdc.emc.com">https://vdc.emc.com</a></p>  <p>The screenshot shows a dark-themed login window titled "Welcome" with the instruction "Please log on to continue." On the left is a blue padlock icon. To the right are two white input fields: "User name:" and "Password:". A "Log On" button is located at the bottom right.</p>
3	<p>Log in to the Virtual Data Center with the user name and password provided to you by the instructor.</p>  <p>The screenshot shows the same login window as in step 2, but with the "User name:" field containing the text "123456-01" and the "Password:" field filled with a series of black dots. The "Log On" button remains at the bottom right.</p>

Step	Action
4	<p>At the <b>Applications</b> screen, click the <b>Virtual Lab Manager</b> link.</p> 
5	<p>If you see this message, click <b>Continue to this website</b>.</p> 
6	<p>At the Lab Manager login screen, enter the Lab Manager Login <b>User name</b> and <b>Password</b> assigned to you by your instructor. Then, click <b>Login</b>.</p> 

Step	Action
7	<p>You will be working in the <b>NetWorker 8.1 ICA</b> configuration for all the labs for this course. To get your own personal copy of the configuration, clone the configuration to your Lab Manager workspace.</p> <p>In the left pane of the Lab Manager screen, click <b>Library</b>. Next, right-click the <b>NetWorker 8.1 ICA</b> configuration and select <b>Clone to Workspace</b>.</p> 
8	<p>In <b>Clone to Workspace</b>, click <b>OK</b>.</p> 
9	<p>Click <b>Workspace</b> on the left side of the screen.</p> <p><u>Result:</u> When the clone operation completes, you see a clone copy of the NetWorker 8.1 ICA lab configuration in your workspace on the right side of the screen with 5 small console windows as shown here. The status of each window and the configuration is <b>Undeployed</b>.</p> 

Step	Action
10	<p>To be able to use the configuration, it must first be deployed. Highlight the <b>Clone (1) of NetWorker 8.1 ICA</b> configuration and select <b>Deploy with defaults</b>.</p>  <p><u>Note:</u> Deploying the configuration may take 4-5 minutes.</p>
11	<p>After the status of the configuration changes to <b>Deployed</b>, highlight the arrow next to the <b>Clone (1) of NetWorker 8.1 ICA</b> configuration and select <b>Show Consoles</b>.</p> 
12	<p>Alternatively, to see just one console window at a time, click in the small console view of the virtual machine that you want to work in.</p> 

Step	Action
	<p><b>Result:</b> Only the console window for that machine is displayed for you to work on that machine. When you wish to work on another virtual machine, click <b>Configuration</b> in the upper left of the screen and choose another virtual machine console. You can also view a console with Remote Desktop by clicking the <b>Remote Desktop</b> button.</p>  <p><b>Note:</b> For <b>best performance</b>, it is <b>recommended</b> that you perform <b>all labs</b> from a <b>remote desktop</b> session on the <b>nwwindows.emc.edu</b> server. From there you can log in to all other servers.</p>
14	<p>To work on a virtual machine, click inside its console window, or for best performance launch a <b>Remote Desktop</b> session.</p>
15	<p>To send a Ctrl-Alt-Delete sequence to one of the Windows machines if using the console, right-click or mouse over the arrow next to the machine name in the tab and select <b>Ctrl-Alt-Delete</b>.</p>  <p><b>Note:</b> To send Ctrl-Alt-Delete using a key sequence, press <b>Ctrl-Alt-Insert</b>.</p>
16	<p>When prompted to log onto or unlock a Windows virtual machine (nwwindows or winclient), enter the following information in the login screen:</p> <p><u>User name:</u> <b>Administrator</b>  <u>Password:</u> <b>student</b></p> 

Step	Action
17	<p>When prompted to log onto or unlock the Linux virtual machine (nwlinux), best performance can be achieved by initiating a putty session from the nwwindows server. Alternatively you can click in the console window for the machine and enter the following information:</p> <p><u>User name:</u> <b>root</b>  <u>Password:</u> <b>student</b></p> 
18	<p>To bring up a terminal window on the nwlinux host, right-click the <b>Terminal</b> icon and select <b>Open</b>.</p> 
19	<p>You can access the Linux host from the Windows host nwwindows with PuTTY for command line access or with remote desktop for GUI access.</p> 
20	<p>To release the cursor from a console, press <b>Ctrl-Alt</b>.</p>
21	<p>When you are finished with your Lab Manager configuration for the day, just logout of Lab Manager. (There's <i>no</i> need to undeploy the virtual machines until you are finished with all the labs at the end of the class.)  To log out of Lab Manager, click <b>Logout</b> in the upper right corner of the Lab Manager screen.</p> 

*End of Lab Manager Logon Instructions*

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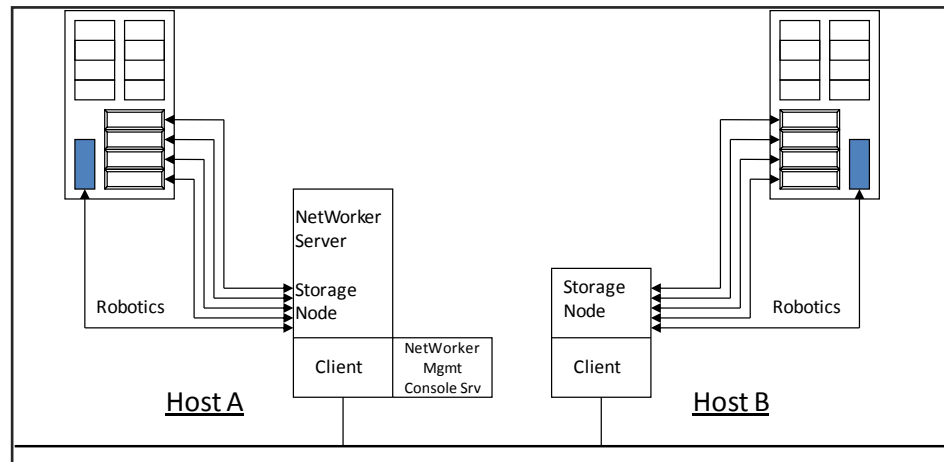
## Lab 2: NetWorker Software Installation

### Purpose:

In this lab you install NetWorker Server and NetWorker Management Console software on either nwwindows or nwlinux. This host will be used for configuration and administration of NetWorker during the remainder of the class. You then configure the host you didn't choose (either nwwindows or nwlinux) as a NetWorker storage node. The storage node will be used in a later lab. In the last section of this lab, you install NetWorker client software on the Windows client, winclient.

### Lab Environment:

In the Virtual Data Center (VDC) environment, two host computers in the VDC are assigned to you as potential NetWorker servers: one is a Linux host (nwlinux) and the other is a Windows 2008 system (nwwindows). You decide which host to use as the NetWorker and Console server. This host is referred to as Host A in the diagram. The other host will be a remote storage node. This host is referred to as Host B in the diagram.



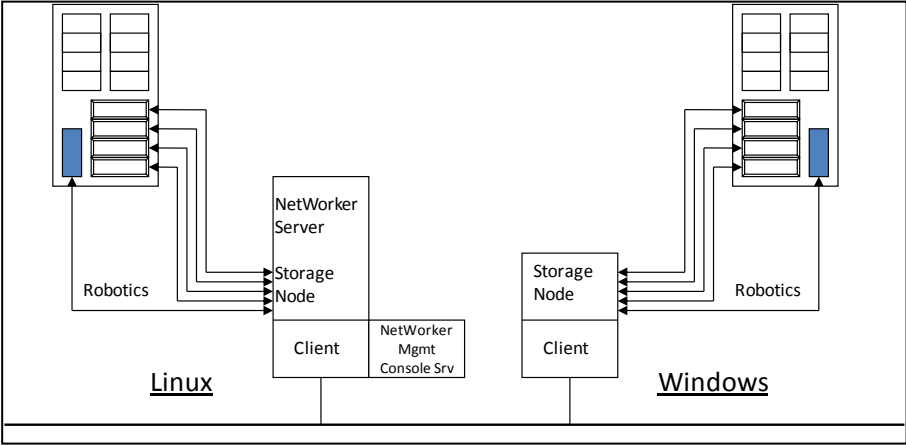
**You decide:** If your Windows host, nwwindows, is Host A, then your Linux host, nwlinux, is Host B. If your Linux host, nwlinux, is Host A, then your Windows host, nwwindows, is Host B.

### Lab 2 Instructions:

If you decide to install the NetWorker Server and NetWorker Management Console on the **Linux** host, nwlinux, perform **Lab 2-1**.

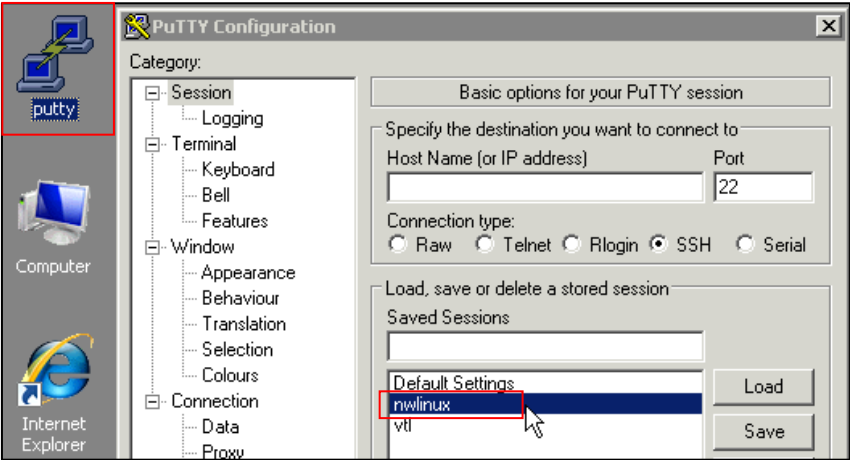

If you decide to install the NetWorker Server and NetWorker Management Console on the **Windows** host, nwwindows, perform **Lab 2-2**.

## Lab Exercise 2-1: Install NetWorker and NMC Software on Linux

<b>Purpose:</b>	In this lab you install the NetWorker server and NetWorker Management Console server software on the Linux host, nwlinux. This host will be used for configuration and administration of NetWorker during the remainder of the class. You configure your Windows host, nwwindows, as a client and remote NetWorker storage node. The storage node is used in a later lab.
<b>Tasks:</b>	<p>In this lab you:</p> <ul style="list-style-type: none"><li>• Install and configure your Linux host, nwlinux, as both a NetWorker server and a NetWorker Management Console server.</li><li>• Verify the installation was successful.</li><li>• Stop and restart the NetWorker processes/services.</li><li>• Install your Windows host, nwwindows, as a NetWorker storage node.</li></ul>
<b>Lab Environment:</b>	 <p>The diagram illustrates the lab environment. On the left, a Linux host is shown with a 'Robotics' component and a 'Storage Node' component. On the right, a Windows host is shown with a 'Storage Node' component and a 'Robotics' component. In the center, a 'NetWorker Server' and a 'NetWorker Mgmt Console Srv' are connected to a 'Client' component. The 'Storage Node' components on both the Linux and Windows hosts are connected to the 'Client' component in the center. The 'Robotics' components on both hosts are also connected to the 'Client' component. The entire setup is labeled 'Linux' and 'Windows' at the bottom.</p>

## Lab Exercise 2-1 Part 1: Install NetWorker Server and Console Server on a Linux Host

Perform the steps in Lab 2-1 *only* if you are installing the NetWorker Server and NetWorker Management Console software on your **Linux** host.

Step	Action
1	<p>Open a remote desktop session and log in to the Windows host, <b>nwwindows</b> with user administrator password student. Then, open a PuTTY session to nwlinux using the PuTTY icon on the desktop.</p>  <p>Log in to nwlinux using the following credentials:</p> <p><u>Username:</u> <b>root</b> <u>Password:</u> <b>student</b></p>
2	<p>Change directory to the location of the EMC NetWorker software. Unzip and untar the software file.</p> <p>Type the following:</p> <ul style="list-style-type: none"><li>• <code>cd /software</code></li><li>• <code>tar xzvf nw81_linux*</code> </li><li>• <code>cd linux_x86_64</code></li></ul> <p><u>Result:</u> The directory <code>/software/linux_x86_64</code> contains the rpm files for the Linux installation.</p> <pre data-bbox="337 1528 1485 1822">[root@nwlinux linux_x86_64]# ls lgtocln-8.1.0.1-1.x86_64.rpm  LGTO_METADATA.linuxx86_64 lgtocln_8.1.0.1_amd64.deb   lgtommc-8.1-1.x86_64.rpm lgtofr-8.1.0.1-1.x86_64.rpm  lgtonode-8.1.0.1-1.x86_64.rpm lgtolja-8.1.0.1-1.x86_64.rpm lgtoserv-8.1.0.1-1.x86_64.rpm lgtoko-8.1.0.1-1.x86_64.rpm  lgtozh-8.1.0.1-1.x86_64.rpm lgtolicm-8.1.0.1-1.x86_64.rpm NetWorkerAdaptor-1.1.0-28-linux-x64.run lgtoman-8.1.0.1-1.x86_64.rpm sd_products.res [root@nwlinux linux_x86_64]#</pre>

Step	Action
3	<p>To install the NetWorker server, install the following rpm files in this order:</p> <p style="text-align: center;">lgtocInt, lgtonode, lgtoserv</p> <p>In the terminal type:</p> <pre style="text-align: center;">rpm -ivh lgtocInt*.rpm lgtonode* lgtoserv*</pre> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <pre>[root@nwlinux linux_x86_64]# rpm -ivh lgtocInt*.rpm lgtonode* lgtoserv* Preparing...                               ##### [100%]  1:lgtocInt                                ##### [ 33%]  2:lgtonode                                ##### [ 67%]  3:lgtoserv                                ##### [100%] [root@nwlinux linux_x86_64]#</pre> </div>
4	<p>To install the man pages and the NetWorker Management Console software on this machine, install the following rpm files:</p> <p style="text-align: center;">lgtoman, lgtonmc</p> <p>In the terminal type:</p> <pre style="text-align: center;">rpm -ivh lgtoman* lgtonmc*</pre> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <pre>[root@nwlinux linux_x86_64]# rpm -ivh lgtoman* lgtonmc* Preparing...                               ##### [100%]  1:lgtonmc                                 ##### [ 50%]  NOTE: To complete configuration execute the following script as root:       /opt/lgtonmc/bin/nmc_config   2:lgtoman                                 ##### [100%] [root@nwlinux linux_x86_64]#</pre> </div>
5	<p>To complete the NetWorker Management Console installation, run the nmc_config script. <b>Accept all default values.</b></p> <p>In the terminal type:</p> <pre style="text-align: center;">/opt/lgtonmc/bin/nmc_config</pre>
6	<p>After all the specified packages are successfully installed, start all the NetWorker processes.</p> <pre style="text-align: center;">/etc/init.d/networker start</pre> <p>Start all Console server processes.</p> <pre style="text-align: center;">/etc/init.d/gst start</pre>
7	<p>During installation of the NetWorker server software, several entries are appended to /etc/syslog.conf. Send a HUP signal to syslogd so that it will reread its configuration file.</p> <pre style="text-align: center;">pkill -HUP syslog</pre>



## Lab Exercise 2-1 Part 2: Verify a Successful Installation on the Linux Host

Step	Action
1	<p>Verify that all the required NetWorker and Console server processes are running:</p> <pre> nsrd                nsrexecd nsrmmdbd           gstd nsrindexd          httpd nsrjobd            dbsrv12                     </pre> <p>In the terminal Type:</p> <pre> ps -eaf   egrep 'nsr gst dbsrv httpd'                     </pre> <pre> [root@nwlinux linux_x86_64]# ps -eaf   egrep 'nsr gst dbsrv httpd' root      4548      1  0 15:31 ?        00:00:00 /usr/sbin/nsrexecd root      4559      1  0 15:32 ?        00:00:00 /usr/sbin/nsrd root      4573  4559  0 15:32 ?        00:00:00 /usr/sbin/nsrmmdbd root      4577  4559  0 15:32 ?        00:00:00 /usr/sbin/nsrindexd root      4580  4559  0 15:32 ?        00:00:00 /usr/sbin/nsrdispd root      4583  4559  0 15:32 ?        00:00:00 /usr/sbin/nsrjobd root      4588  4548  0 15:32 ?        00:00:00 /usr/sbin/nsrlogd root      4633      1  0 15:32 ?        00:00:00 /opt/igtonmc/bin/gstd root      4645  4559  0 15:32 ?        00:00:00 /usr/sbin/nsrvmwsd root      4670  4633  5 15:32 ?        00:00:03 /opt/igtonmc/sybase/bin/dbsrv12 -x tcpip(ServerPort=2638) -ti 1500 -tl 6000 -sb 0 -Q -gk all -o /opt/igtonmc/lo s/db_output.log -ch 500m -n gst_on_nwlinux /opt/igtonmc/igto_gstdb/igto_gst.db root      4697  4548  0 15:32 ?        00:00:00 /usr/sbin/nsrsnmd -s nwlinux.em .edu -M 655 -n 424768513 -N 1 root      4714      1  0 15:32 ?        00:00:00 /opt/igtonmc/apache/bin/httpd - /opt/igtonmc/apache/conf/httpd.conf nobody    4715  4714  0 15:32 ?        00:00:00 /opt/igtonmc/apache/bin/httpd - /opt/igtonmc/apache/conf/httpd.conf root      4735  4261  0 15:33 pts/1    00:00:00 egrep nsr gst dbsrv httpd [root@nwlinux linux_x86_64]# █                     </pre>
2	<p>Stop all the NetWorker daemons. Verify they are no longer running.</p> <pre> nsr_shutdown ps -ef   grep nsr                     </pre> <pre> [root@nwlinux linux_x86_64]# nsr_shutdown Stopping service: nsrd (4559) Waiting for service: nsrd (4559) Waiting for service: nsrd (4559) Waiting for service: nsrd (4559) Service nsrd (4559) shutdown. Stopping service: nsrexecd (4548) Service nsrexecd (4548) shutdown. [root@nwlinux linux_x86_64]# ps -ef  grep nsr root      5075  4261  0 15:36 pts/1    00:00:00 grep nsr [root@nwlinux linux_x86_64]# █                     </pre>

Step	Action
3	Restart all the NetWorker daemons.  <pre data-bbox="461 262 935 289">/etc/init.d/networker start</pre>
4	Stop all the Console server daemons and verify they are no longer running.  <pre data-bbox="461 409 1029 474">/etc/init.d/gst stop ps -eaf   egrep 'gst dbsrv httpd'</pre> <div data-bbox="354 514 1469 674" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <pre>[root@nwlinux linux_x86_64]# /etc/init.d/gst stop Stopping GST: .. done. [root@nwlinux linux_x86_64]# ps -eaf   egrep 'gst dbsrv httpd' root      11142 10047  0 13:57 pts/2    00:00:00 egrep gst dbsrv httpd</pre> </div>
5	Restart the Console server daemons.  <pre data-bbox="461 793 829 821">/etc/init.d/gst start</pre> <div data-bbox="506 861 1313 1054" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <pre>[root@nwlinux linux_x86_64]# /etc/init.d/gst start Starting GST: GST Services, Version 8.1.Build.199  done. [root@nwlinux linux_x86_64]# █</pre> </div>
6	Change directory to /opt. You should see the directory containing the Console server software, lgtonmc.  <pre data-bbox="415 1213 542 1278">cd /opt ls -al</pre> <p data-bbox="321 1325 1398 1390">Change directory to the location of the Console server database lgto_gstdb and list the contents.</p> <pre data-bbox="415 1419 873 1484">cd /opt/lgtonmc/lgto_gstdb ls -al</pre> <p data-bbox="321 1530 1438 1596">Change directory to /nsr and list the contents. Among the other NetWorker directories, you should see the directories for the NetWorker control data: index, mm and res.</p> <pre data-bbox="415 1631 542 1696">cd /nsr ls -al</pre>

## Lab Exercise 2-1 Part 3: Install a NetWorker Storage Node on a Windows Host

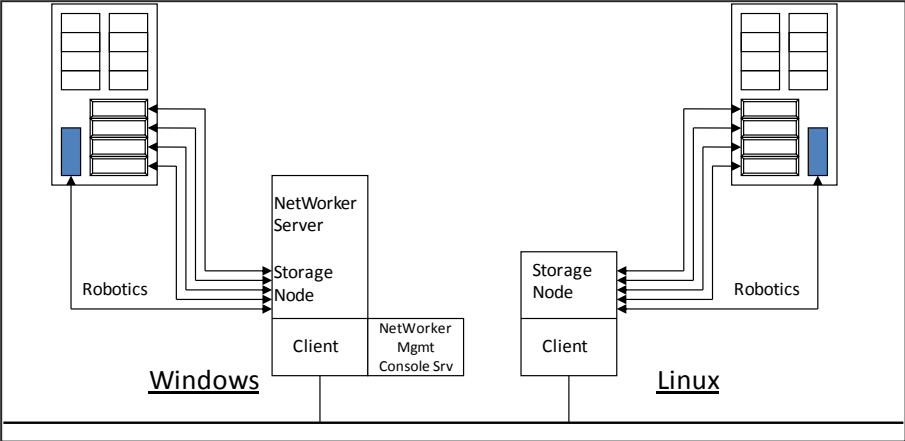
In this lab, you install the NetWorker storage node software on the **nwwindows** machine.

Step	Action
1	If not already there, log in to the Windows host, <b>nwwindows.emc.edu</b> , using the <b>administrator</b> account, password <b>student</b> if you have not already done so.
2	Open the <b>C:\software\nw81_win_x64\win_x64</b> folder.
3	<p>From Windows explorer, run the following file. <u>Double-click or execute:</u> <b>autorun</b></p> <p>In the Internet Explorer window that opens, click <b>Install EMC NetWorker 8.1 Software</b></p> <div style="border: 1px solid black; padding: 10px; text-align: center;"><p><a href="#">Install EMC NetWorker 8.1 software</a></p><p><a href="#">Visit the EMC Software web site</a></p></div>
4	<p>Install NetWorker, providing all the information specified below when prompted:</p> <ol style="list-style-type: none"><li>1. Click <b>Run</b> to run the software; click <b>Run</b> again.</li><li>2. Select a language for the installation.</li><li>3. Do <b>NOT</b> configure the <b>Windows firewall</b>.</li><li>4. Install <b>Storage Node</b> software. This also installs the client software.</li><li>5. Use the default installation directory.</li><li>6. When prompted for NetWorker servers that are allowed to back up your host, do not specify any. <u>Warning:</u> This is insecure but avoids possible backup failures in later Lab Exercises!</li><li>7. Do <b>not</b> run the Change Journal Manager after installation (uncheck the option).</li></ol>
5	Close the <b>Thank you for selecting EMC NetWorker</b> Internet Explorer window.

*End of Lab Exercise 2-1*

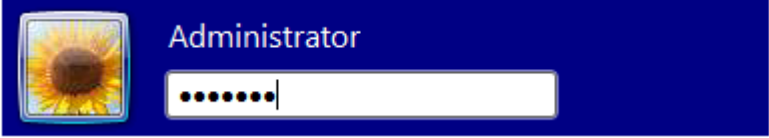
*Go to Lab 2-3*

## Lab Exercise 2-2: Install NetWorker and NMC Software on Windows

<b>Purpose:</b>	In this lab you install the NetWorker server and NetWorker Management Console server software on the Windows host, nwwindows. This host is used for configuration and administration of NetWorker during the remainder of the class. You will configure your Linux host, nwlinux, as a remote NetWorker storage node. The storage node is used in a later lab.
<b>Tasks:</b>	In this lab you: <ul style="list-style-type: none"><li>• Install and configure your Windows host, nwwindows, as both a NetWorker server and a NetWorker Management Console server.</li><li>• Verify the installation was successful.</li><li>• Stop and restart the NetWorker processes/services.</li><li>• Install your Linux host, nwlinux, as a NetWorker storage node.</li></ul>
<b>Lab Environment:</b>	 <p>The diagram illustrates the lab environment. On the left, a <b>Windows</b> host is shown with a server rack icon. It contains a <b>Robotics</b> component and is connected to a central <b>NetWorker Server</b> and <b>Storage Node</b>. Below the Windows host, the labels <b>NetWorker Server</b>, <b>Storage Node</b>, <b>Client</b>, and <b>NetWorker Mgmt Console Srv</b> are listed. On the right, a <b>Linux</b> host is shown with a server rack icon. It contains a <b>Storage Node</b> and a <b>Robotics</b> component. Below the Linux host, the labels <b>Storage Node</b> and <b>Client</b> are listed. Arrows indicate connections between the Robotics components and the Storage Nodes on both hosts, and between the Storage Nodes and the central NetWorker Server and Storage Node.</p>

### Lab Exercise 2-2 Part 1: Install NetWorker Server and NMC on a Windows Host

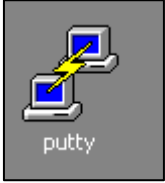
Perform the steps in Lab 2-2 **ONLY** if you are installing the NetWorker Server and NetWorker Management Console software on the **Windows** host, nwwindows.emc.edu.

Step	Action
1	<p>Log in to the Windows host, nwwindows, using the <b>administrator</b> account, password <b>student</b>.</p> 
2	<p>Browse to the <code>C:\software\nw81_win_x64\win_x64</code> folder.</p>
3	<p><b>Double-click</b> the file named <b>autorun</b>.</p> <p><b>Install</b> NetWorker, using the information below:</p> <ol style="list-style-type: none"> <li>1. Click <b>Run</b> to run the software.</li> <li>2. In the <i>Thank you for selecting EMC NetWorker</i> Internet Explorer window, click <b>Install EMC NetWorker 8.1 software</b>.</li> <li>3. Click <b>Run</b> to run the software; click <b>Run</b> again.</li> <li>4. Select a language for the installation.</li> <li>5. Do <b>NOT</b> configure the Windows firewall.</li> <li>6. Install <b>Server and Client</b> and <b>NetWorker Management Console</b> software. (This also installs the storage node software.)</li> <li>7. <b>Uncheck</b> Block Based Backups</li> <li>8. Use the default installation directory.</li> <li>9. Accept the terms of the license agreement</li> <li>10. When prompted for NetWorker servers that are allowed to back up your host, do not specify any. <u>Warning</u>: This is less secure but avoids possible backup failures in later labs.</li> </ol>
4	<p>Use the following information for <b>the NetWorker Management Console</b> part of the installation:</p> <ul style="list-style-type: none"> <li>• Use the default installation directories.</li> <li>• Use the default port numbers for the Web Server and the Client Service.</li> <li>• Do not launch the Console client after installation (uncheck the option).</li> </ul> <p>Click <b>Finish</b> to exit the wizard.</p>
5	<p>Do <b>NOT</b> run the Change Journal Manager after NetWorker server installation.</p> <p>Click <b>Finish</b> to exit the installation process.</p>
6	<p>Close Internet Explorer.</p>

## Lab Exercise 2-2 Part 2: Verify Successful Installation on the Windows Host

Step	Action
1	<p>On <b>nwwindows</b>, open the <b>Services</b> window and verify that the following services are running:</p> <ul style="list-style-type: none"> <li>• NetWorker Backup and Recover Server</li> <li>• NetWorker Remote Exec Service</li> <li>• EMC GST Service</li> <li>• EMC GST Web Service</li> </ul> <p><u>Note:</u> Services are viewed using <b>Start &gt; All Programs &gt; Administrative Tools &gt; Services</b>, or by typing <b>services.msc</b> in the <b>Start &gt; Run</b> box.</p>
2	<p>Right-click the <b>NetWorker Remote Exec Service</b> and select <b>Stop</b> from the menu. Note that the other services depend on this service and therefore will be stopped as well.</p>
3	<p>Start all the services that were stopped. <u>Note:</u> EMC GST Web Service is started automatically when the EMC GST service is started.</p> <p>Right-click <b>NetWorker Remote Exec Service</b> and select <b>Start</b> from the menu. Right-click <b>NetWorker Backup and Recover Server</b> and select <b>Start</b>. Right-click <b>EMC GST Service</b> and select <b>Start</b>.</p> <p>Close the <b>Services</b> window.</p>
4	<p>Open the Task Manager and verify that all required NetWorker and Console processes are running. Right-click the task bar at the bottom of the screen, select <b>Task Manager</b> and go to the <b>Processes</b> tab. Check the box at the bottom of the window entitled <b>Show processes from all users</b>.</p> <ul style="list-style-type: none"> <li>• Dbsrv12</li> <li>• gstd</li> <li>• httpd</li> <li>• nsrd</li> <li>• nsrexcd</li> <li>• nsrindexd</li> <li>• nsrjobd</li> <li>• nsrlogd</li> <li>• nsrmdbd</li> <li>• nsrsnmd</li> </ul> <p>Close Task Manager.</p>

## Lab Exercise 2-2 Part 3: Install a NetWorker Storage Node on the Linux Host

Step	Action
1	<p>Log in to the Linux host, nwlinux, via the <b>puTTY</b> link on the desktop with the following:</p> <ul style="list-style-type: none"> <li>• <u>Username</u>: <b>Root</b></li> <li>• <u>Password</u>: <b>Student</b></li> </ul> <div style="text-align: center;">  </div>
2	<p>Change to the <b>/software</b> directory and extract the software files.</p> <p><u>Type</u>:</p> <pre>cd /software tar xzvf nw81_linux* cd linux_x86_64</pre> <p><u>Result</u>: The directory <code>/software/linux_x86_64</code> contains the rpm files for the Linux installation.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <pre>[root@nwlinux linux_x86_64]# ls lgtocln-8.1-1.x86_64.rpm  LGTO_METADATA.linuxx86_64 lgtocln_8.1_amd64.deb    lgtommc-8.1-1.x86_64.rpm lgtofr-8.1-1.x86_64.rpm  lgtonode-8.1-1.x86_64.rpm lgtolja-8.1-1.x86_64.rpm lgtoserv-8.1-1.x86_64.rpm lgtoko-8.1-1.x86_64.rpm lgtozh-8.1-1.x86_64.rpm lgtolicm-8.1-1.x86_64.rpm NetWorkerAdaptor-1.1.0-28-linux-x64.run lgtoman-8.1-1.x86_64.rpm sd_products.res [root@nwlinux linux_x86_64]#</pre> </div>
3	<p>To install the NetWorker storage node, the following rpm files must be installed in the following order:</p> <p style="text-align: center;">lgtocln, lgtoman, lgtonode</p> <p>In the putty terminal type:</p> <p style="text-align: center;"><b>rpm -ivh lgtocln*.rpm lgtoman* lgtonode*</b></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <pre>[root@nwlinux linux_x86_64]# rpm -ivh lgtocln*.rpm lgtoman* lgtonode* Preparing...                               ##### [100%]  1:lgtocln                                  ##### [ 33%]  2:lgtoman                                  ##### [ 67%]  3:lgtonode                                  ##### [100%] [root@nwlinux linux_x86_64]#</pre> </div>

Step	Action
4	<p>Start the NetWorker client process and verify that it is running.</p> <p><u>Type:</u>     <code>/etc/init.d/networker start</code></p> <p><u>Type:</u>     <code>ps -ef   grep nsr</code></p>

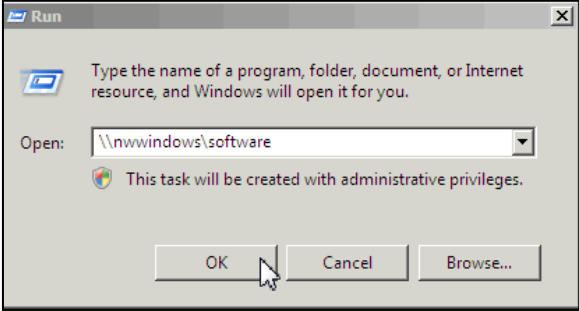
*End of Lab Exercise 2-2*

*Go to Lab Exercise 2-3*

## Lab Exercise 2-3: Install NetWorker Client Software on Windows

<b>Purpose:</b>	In this lab you install NetWorker client software on your Windows client machine, winclient.
<b>Tasks:</b>	In this lab you: <ul style="list-style-type: none"><li>• Install NetWorker client software on the Windows machine, winclient.</li></ul>

## Lab Exercise 2-3 Part 1: Install NetWorker Client Software on a Windows Host

Step	Action
1	<p>Start a remote desktop session using the link on the desktop and log in to the Windows host, <b>winclient.emc.edu</b> using the following:</p> <ul style="list-style-type: none"> <li>• <u>Username</u>: <b>Administrator</b></li> <li>• <u>Password</u>: <b>Student</b></li> </ul>
2	<p>From Windows <b>Start &gt; Run</b>, open the share <b>\\nwwindows\software</b>.</p> 
2	<p>Open the <b>nw81_win_x64\win_x64</b> folder in the share.</p>
3	<p>Double-click or execute: <b>autorun</b></p> <p>Install NetWorker, providing all the information specified below when prompted:</p> <ol style="list-style-type: none"> <li>1. Click <b>Run</b> to run the software.</li> <li>2. In the <b>Thank you for selecting EMC NetWorker</b> Internet Explorer window, click <b>Install EMC NetWorker 8.1 software</b>.</li> <li>3. Click <b>Run</b> to run the software. Click <b>Run</b> again.</li> <li>4. Do <i>not</i> configure the Windows firewall.</li> <li>5. Install <b>Client</b> software only.</li> <li>6. Use the default installation directory.</li> <li>7. When prompted for NetWorker servers that are allowed to back up your host, do not specify any.</li> <li>8. Do <i>not</i> run the Change Journal Manager after installation (uncheck the option).</li> </ol>
4	<p>Close Internet Explorer.</p>

Step	Action
5	Enter the server names of the servers you selected for each client:  <Networker_Server> _____  <Storage_Node> _____  <Client> _____
6	<b>Reboot</b> each of the machines that you installed software on. <ul style="list-style-type: none"> <li>• For <b>nwwindows</b> and <b>winclient</b>, select <b>Start -&gt; Restart</b></li> <li>• For <b>nwlinux</b>, from a command prompt type: <b>reboot</b></li> </ul>

*End of Lab 2-3*

*End of Lab 2*

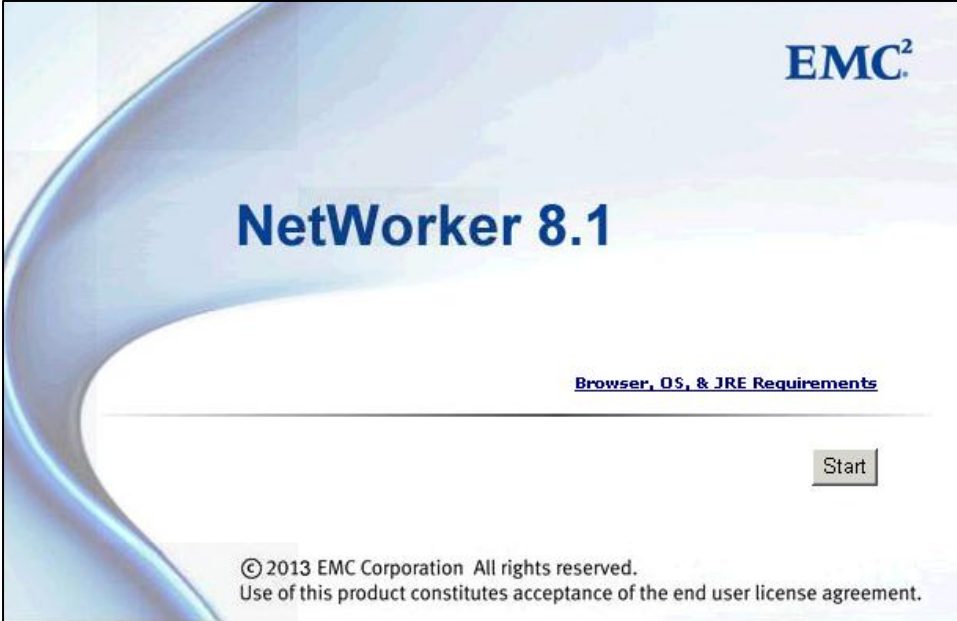
## Lab 3: Using the NetWorker Management Console

<b>Purpose:</b>	In this lab, you explore the Console GUI
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<b>Tasks:</b>	In this lab you will: <ul style="list-style-type: none"><li>• Launch Console and define a NetWorker server to manage.</li></ul>
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## Lab Exercise 3-1: Connect to the Console Server from the Windows Host


Note: For all of the labs in this course you will be connecting to the console server from the Windows server, `nwwindows`.

Step	Action
1	<p>Open a <b>remote desktop</b> session to the <code>nwwindows.emc.edu</code> server.</p> <p>From <code>nwwindows</code>, connect to the Console server by opening Internet Explorer on that host and browsing to the following URL:</p> <p style="text-align: center;"><code>http://console_server:9000</code></p> <p>Replace <code>console_server</code> with the host name of your Console server, either <code>nwlinux.emc.edu</code> or <code>nwwindows.emc.edu</code>.</p> <div data-bbox="435 806 1386 1423" style="border: 1px solid black; padding: 10px;"></div>

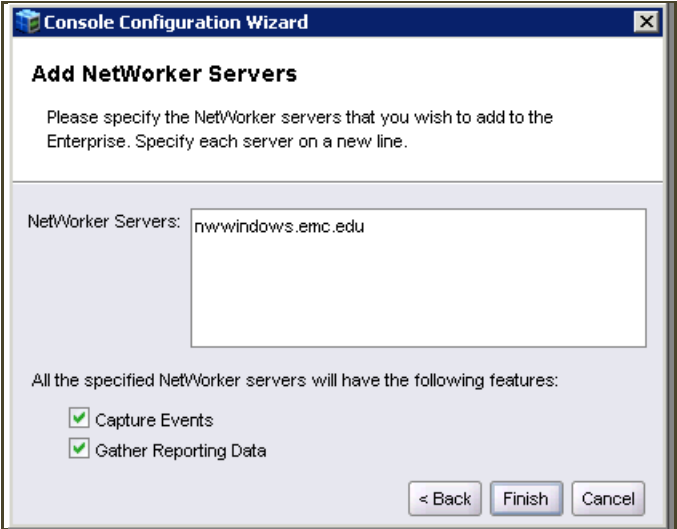
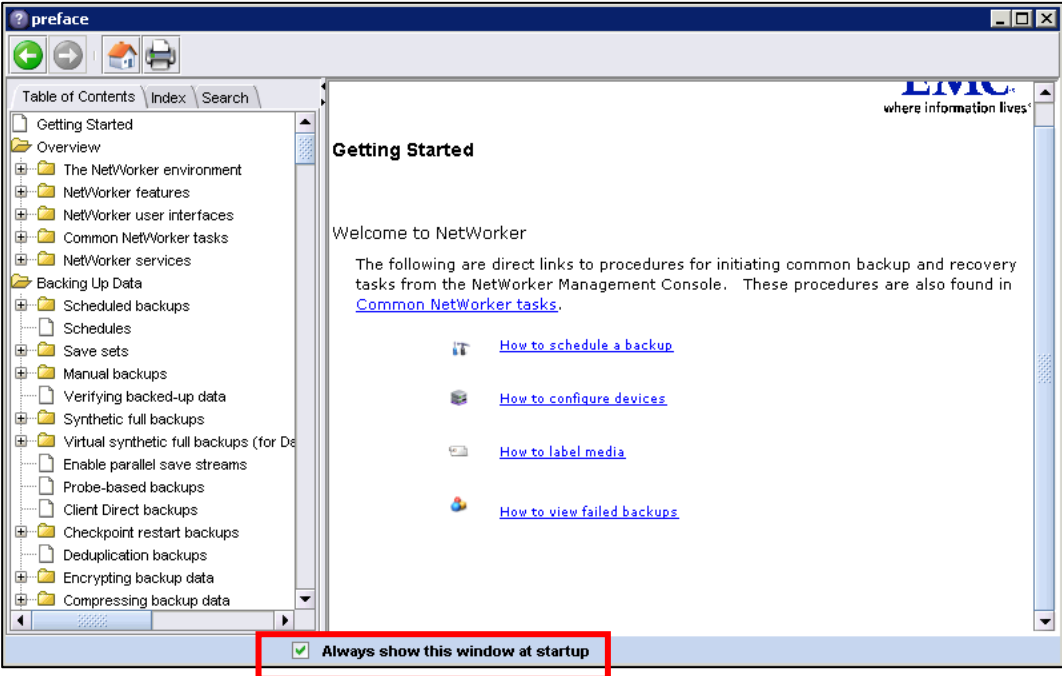
Step	Action
2	<p>Click <b>Start</b> to launch the Console client. Answer <b>yes</b> to any security questions.</p> <p>Click <b>Run</b> to start the application.</p> <p><b>Accept</b> the End User License Agreement.</p> <p>The first time you log in to NetWorker Management Console, the <b>Console Configuration Wizard</b> starts.</p> <p>It will be used in the <b>next lab</b> to initially configure portions of your NetWorker environment.</p> <div data-bbox="500 548 1318 1140" data-label="Image"> </div> <p><u>Note</u>: Whenever the Console server is used in the remaining labs for this course, start it from the Windows host, <b>nwwindows.emc.edu</b>.</p>

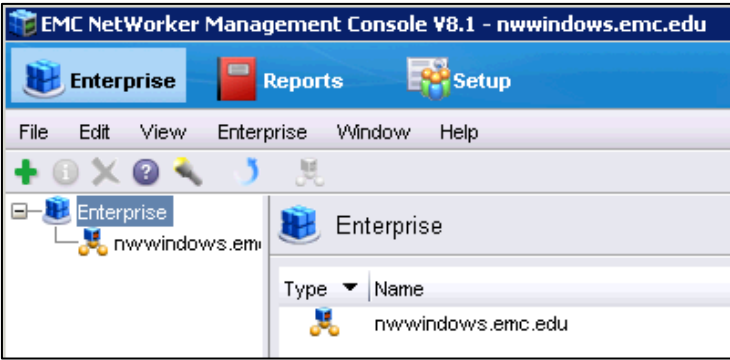
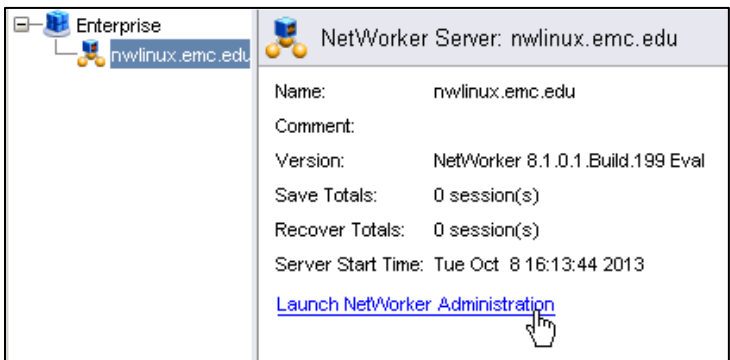
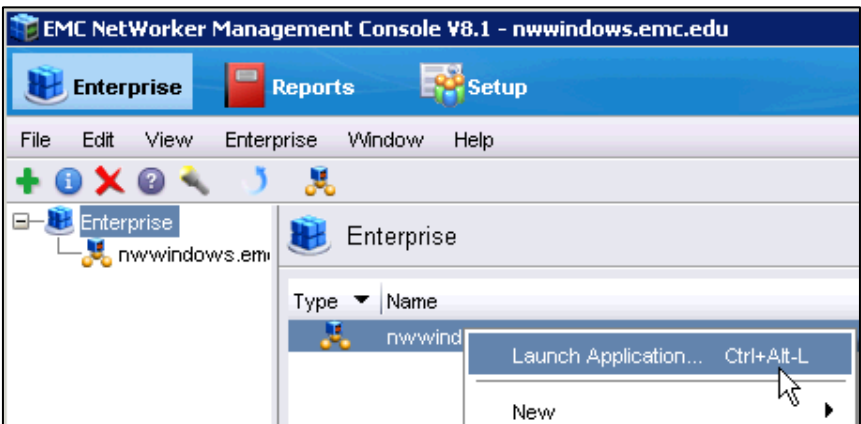
*End of Lab Exercise 3-1*

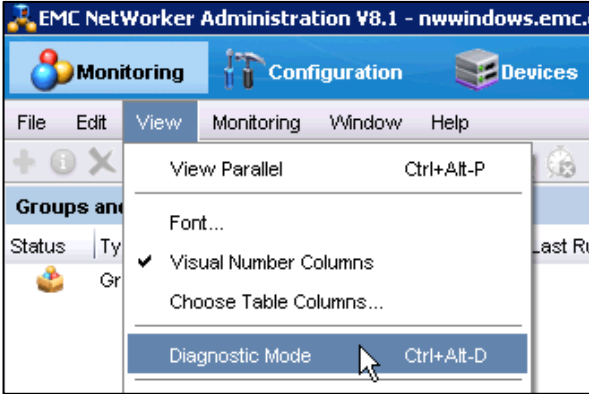
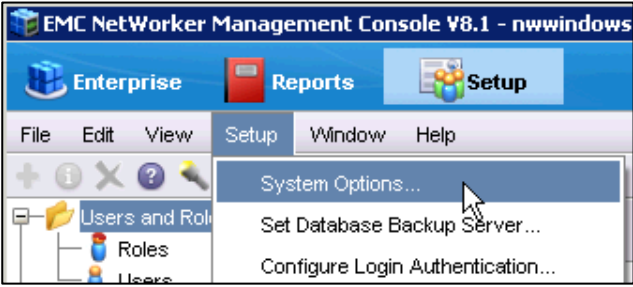
## Lab Exercise 3-2: Customize the NetWorker Management Console Server

Step	Action
1	<p>The first time you log in to the NetWorker Management Console, the <b>Console Configuration Wizard</b> starts and displays a welcome screen.</p> <p>Run the wizard and follow the instructions.</p> <p><u>Note:</u> If the wizard is not currently running, start it from the Console <b>Setup</b> window. Select <b>Setup &gt; Configuration Wizard</b>. Also, the wizard can be rerun at any time.</p> <div data-bbox="500 655 1318 1247" style="border: 1px solid black; padding: 10px;"></div> <p>Click <b>Next</b>.</p>

Step	Action
2	<p>Set the password for the NetWorker Administrator user account to: <b>networker</b> Confirm the password.</p> <div data-bbox="576 304 1242 787" style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p><b>Console Configuration Wizard</b></p> <p><b>Set Administrator Password</b></p> <p>The password must contain at least eight characters and cannot be the same as user name.</p> <p>Password: <input type="password" value="••••••••"/></p> <p>Confirm Password: <input type="password" value="••••••••"/></p> <p style="text-align: right;"> <input style="margin-right: 5px;" type="button" value=" &lt; Back "/> <input style="margin-right: 5px;" type="button" value=" Next &gt; "/> <input style="margin-right: 5px;" type="button" value=" Cancel "/> </p> </div> <p>Click <b>Next</b>.</p>
3	<p>Specify <b>the fully qualified name</b> of your NetWorker server in the <b>NetWorker Server</b> field.</p> <p><u>Note</u>: Ensure that the client name matches the NetWorker Server name exactly and that the <b>FQDN</b> is used for both.</p> <div data-bbox="576 1081 1242 1606" style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p><b>Console Configuration Wizard</b></p> <p><b>Set Database Backup Server</b></p> <p>Please specify the NetWorker server that will backup the Console database. If you do not wish to set/change the backup server click Next.</p> <p>NetWorker Server: <input type="text" value="nwwindows.emc.edu"/></p> <p>Create client resource on this server: <input checked="" type="checkbox"/></p> <p>Client name: <input type="text" value="nwwindows.emc.edu"/></p> <p style="text-align: right;"> <input style="margin-right: 5px;" type="button" value=" &lt; Back "/> <input style="margin-right: 5px;" type="button" value=" Next &gt; "/> <input style="margin-right: 5px;" type="button" value=" Cancel "/> </p> </div> <p>Click <b>Next</b>.</p>

Step	Action
4	<p>Enter the <b>FQDN</b> of your NetWorker server in the <b>NetWorker Servers</b> field.</p>  <p>Click <b>Finish</b> to perform the configuration wizard tasks.</p>
5	<p>The NetWorker Management Console interface is opened and the <b>Getting Started</b> window is displayed.</p> <p><b>Uncheck</b> the box at the bottom of the window so that this window is not displayed every time the Console interface is started.</p>  <p>Close the window.</p>

Step	Action
6	<p>The NetWorker Console window is displayed with the <b>Enterprise</b> button open.</p> 
7	<p>In the Console <b>Enterprise</b> window, click the name of your NetWorker server (either nwwindows or nwlinux) in the left pane. Then, click <b>Launch NetWorker Administration</b>.</p>  <p>You can also right-click <b>NetWorker</b> in the right pane and select <b>Launch Application</b>.</p> 

Step	Action
8	<p>From the menu bar, select <b>View &gt; Diagnostic Mode</b>.</p>  <p><b>Note:</b> Diagnostic mode is needed to see many of the NetWorker resource attributes that we will be using in the following labs.</p>
9	<p>To facilitate faster monitoring of NetWorker activities,</p> <p>From the Console <b>Setup</b> tab, select <b>System Options</b> from the <b>Setup</b> pull-down menu.</p> 

Step	Action
10	<p>In the <b>System Options</b> window, set the following field values:</p> <ul style="list-style-type: none"> <li>• <u>Polling interval for events and reporting</u>: <b>2</b></li> <li>• <u>Polling thread factor</u>: <b>2</b></li> </ul> <div data-bbox="573 373 1250 1056" data-label="Image"> </div> <p>Click <b>OK</b> to save the settings and close the dialog box.</p>

*End of Lab Exercise 3-2*

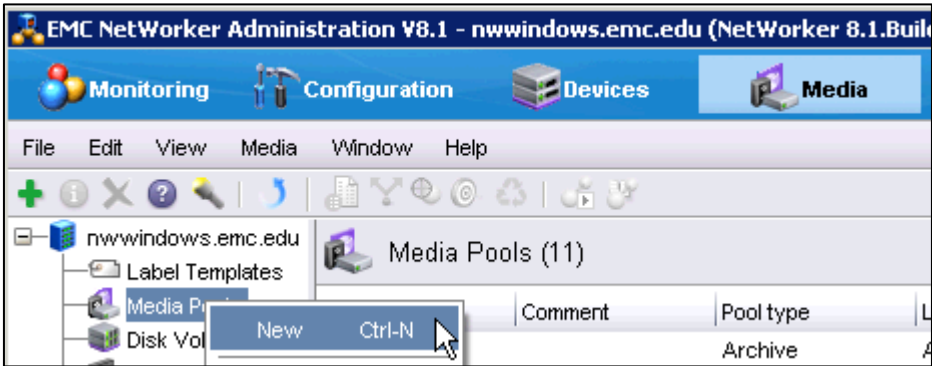
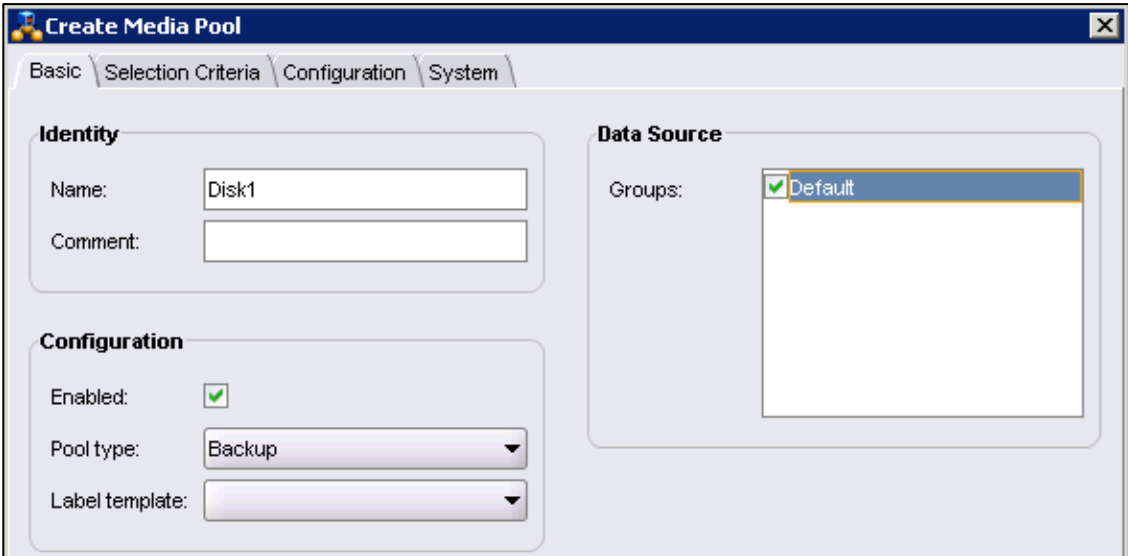
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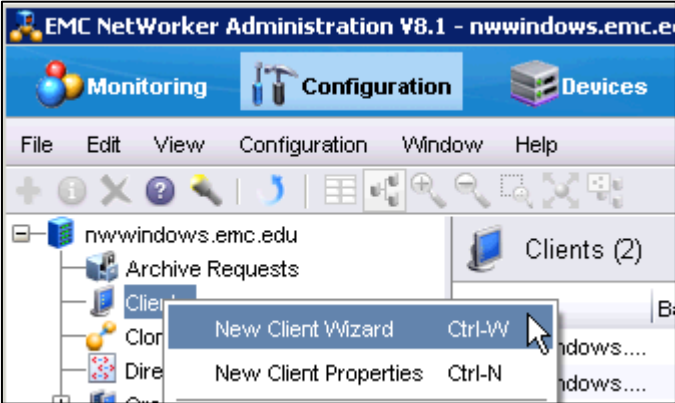
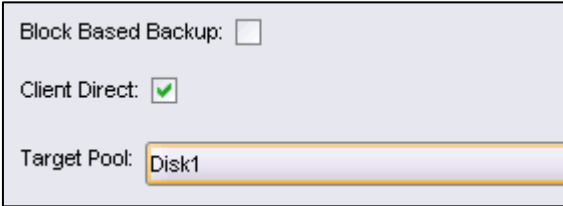
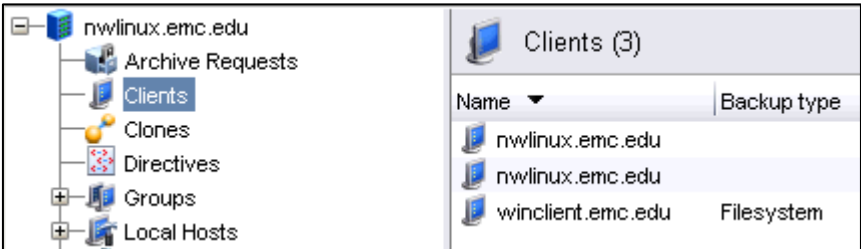
## Lab 4: Perform NetWorker Backups

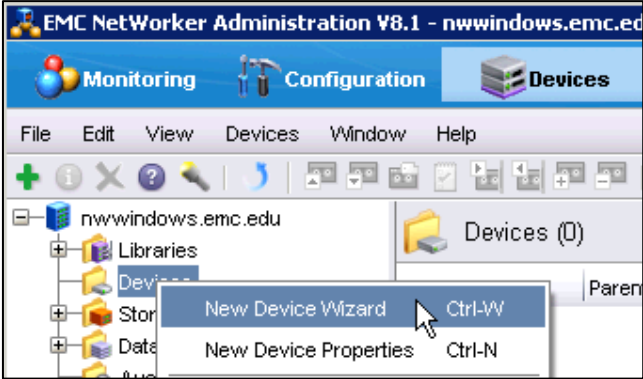
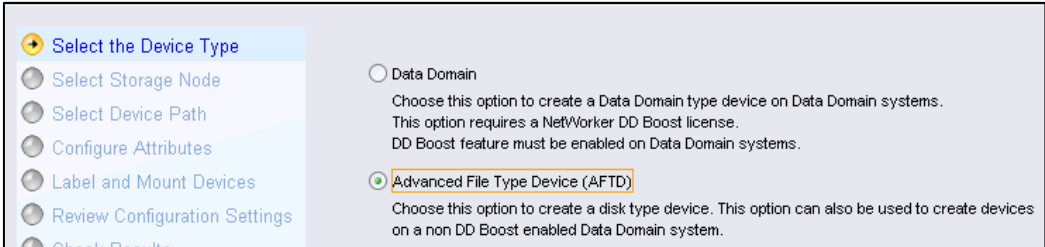
<b>Purpose:</b>	In this lab, you perform various backups of the NetWorker client, winclient.emc.edu.
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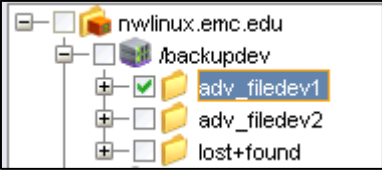
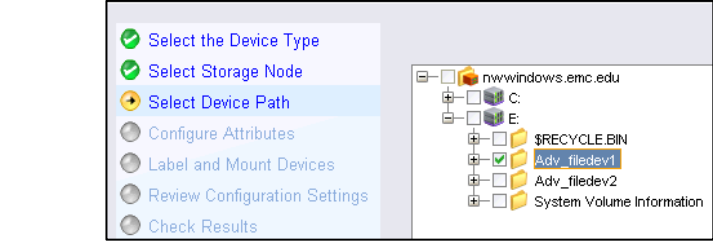
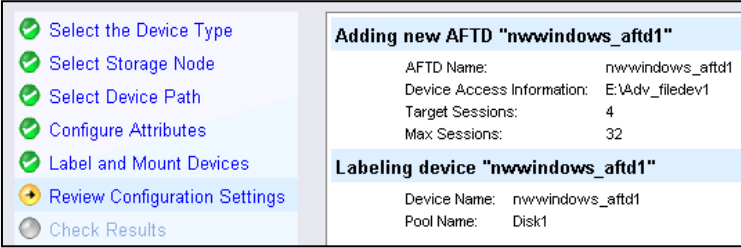
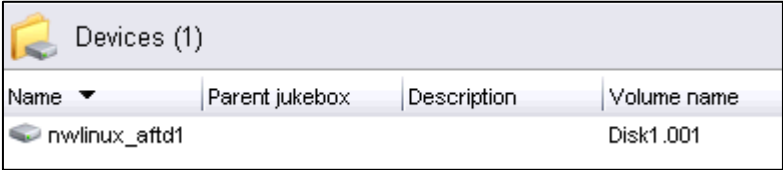
<b>Tasks:</b>	<p>In this lab you:</p> <ul style="list-style-type: none"><li>• Perform client-initiated backups using NetWorker User and the save.</li><li>• Perform server-initiated backups.</li><li>• Configure the resources required to satisfy a given scenario.</li><li>• Configure server-side and client-side directives.</li></ul>
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## Lab Exercise 4-1: Prepare for Backups

Step	Action
1	Start <b>NetWorker Administration</b> from a remote desktop session to the <b>nwwindows.emc.edu</b> host.
2	<p>A pool is a NetWorker resource that represents a set of volumes. To separate our disk backup data from data stored on other media later in the course, we'll create a pool for our disk devices.</p> <p>From the <b>Media</b> tab, right-click <b>Media Pools</b> in the left pane and select <b>New</b>.</p> 
3	<p>Type <b>Disk1</b> for <b>Name</b>. Leave the <b>Label template</b> field blank and check <b>Default</b> for <b>Groups</b>.</p>  <p>Click <b>OK</b>. An error box displays telling you that no label template was selected. Click <b>OK</b> to acknowledge the error box, and click <b>OK</b> again on the Media Pool Creation window again. This automatically creates and applies a label template with the same name of the Media Pool.</p>

Step	Action										
4	<p>Create a resource for the Windows host, <b>winclient</b>, using the <b>Client Backup Configuration</b> wizard. From the <b>Configuration</b> tab, right-click <b>Clients</b> in the left pane and select <b>New Client Wizard</b>.</p> 										
5	<p>Enter the following information in the <b>Client Backup Configuration</b> wizard:</p> <p><b>Client Backup Configuration Wizard</b></p> <ul style="list-style-type: none"> <li>• <u>Client Name</u>: <b>winclient.emc.edu</b></li> <li>• Click <b>Next</b> to accept defaults until prompted to select a <b>pool</b></li> <li>• <u>Target Pool</u>: <b>Disk1</b></li> </ul>  <p>Click <b>Create</b> to create the client resource. Click <b>Finish</b> to exit the wizard.</p> <p><u>Result</u>: A client resource is created for <b>winclient.emc.edu</b>.</p>  <table border="1" data-bbox="930 1371 1339 1617"> <thead> <tr> <th colspan="2">Clients (3)</th> </tr> <tr> <th>Name</th> <th>Backup type</th> </tr> </thead> <tbody> <tr> <td>nwlinux.emc.edu</td> <td></td> </tr> <tr> <td>nwlinux.emc.edu</td> <td></td> </tr> <tr> <td>winclient.emc.edu</td> <td>Filesystem</td> </tr> </tbody> </table>	Clients (3)		Name	Backup type	nwlinux.emc.edu		nwlinux.emc.edu		winclient.emc.edu	Filesystem
Clients (3)											
Name	Backup type										
nwlinux.emc.edu											
nwlinux.emc.edu											
winclient.emc.edu	Filesystem										

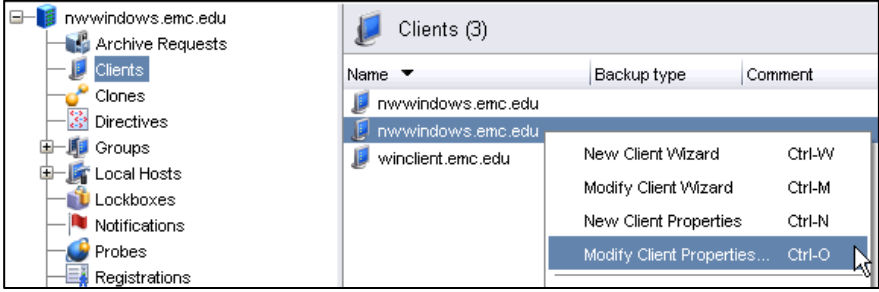
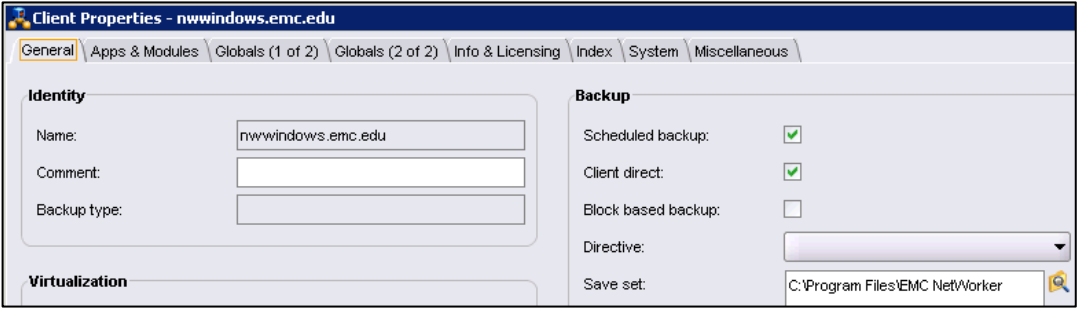
Step	Action
6	<p>An AFTD is a NetWorker disk device that supports concurrent backup and restore operations. An AFTD uses a directory within a file system as its volume. We will label this device into the pool, Disk1. A directory on the NetWorker server has already been created for you to use for the AFTD.</p> <p>From the <b>Devices</b> tab, right-click <b>Devices</b> in the left pane and select <b>New Device Wizard</b>.</p> 
7	<p>Select <b>Advanced File Type Device (AFTD)</b> for device type.</p>  <p>Click <b>Next</b>.</p>
8	<p>On the <b>Select Storage Node</b> screen:</p> <p>Select <b>Next</b>, and accept all default settings to use the NetWorker server as the storage node.</p>

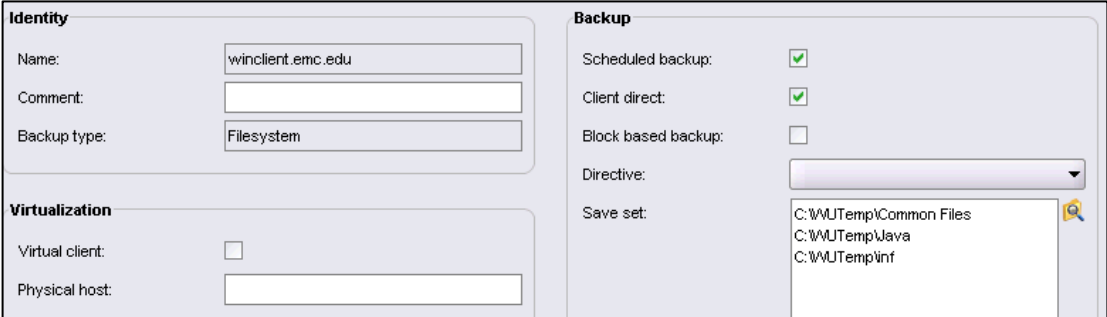
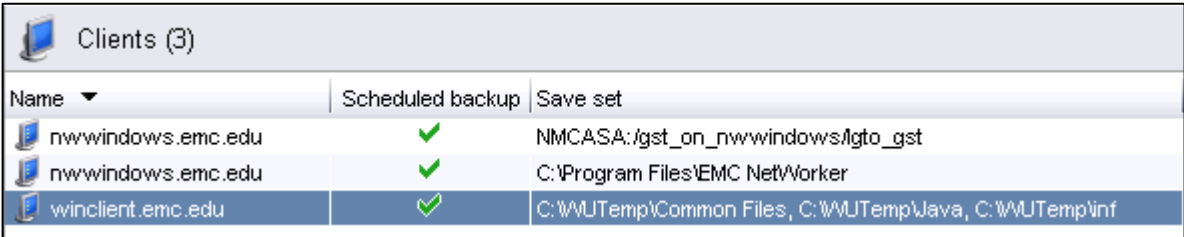
Step	Action
9	<p>On the <b>Select Device Path</b> screen select the folder to use based on which server you chose as your NetWorker server:</p> <ul style="list-style-type: none"> <li>• <u>Linux NetWorker Server:</u> <b>/backupdev/adv_filedev1</b></li> </ul>  <ul style="list-style-type: none"> <li>• <u>Windows NetWorker Server:</u> <b>E:\Adv_filedev1</b></li> </ul> 
10	<p>For device name, enter:</p> <ul style="list-style-type: none"> <li>• <u>Windows NetWorker Server:</u> <b>nwwindows_aftd1</b></li> <li>• <u>Linux NetWorker Server:</u> <b>nwlinux_aftd1</b></li> </ul> <p>For pool, select: <b>Disk1</b></p> <p>Use default values for the other attributes, clicking <b>next</b> to continue.</p> 
11	<p>Click <b>Configure</b> to create the AFTD. Then, click <b>Finish</b> to exit the wizard.</p> 

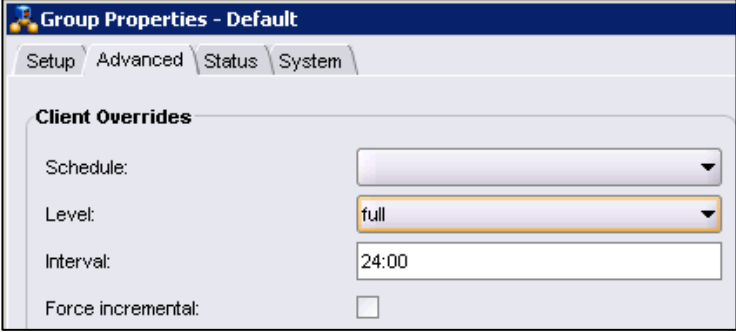
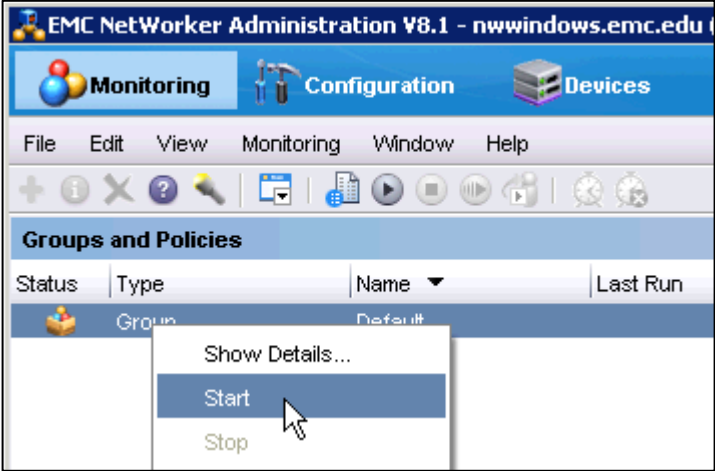
*End of Lab Exercise 4-1*

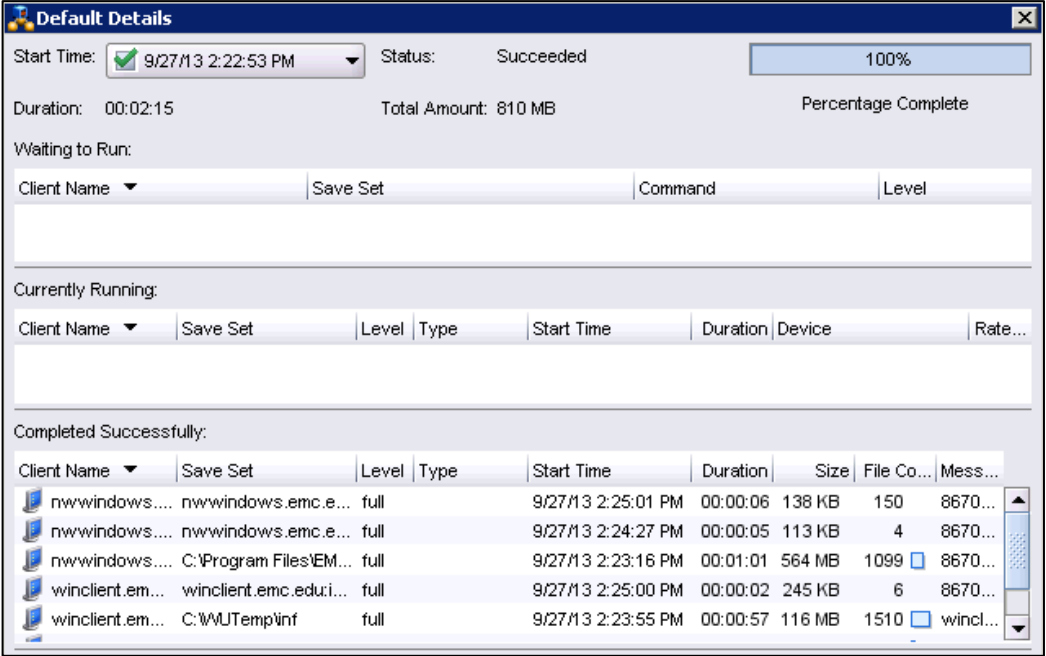
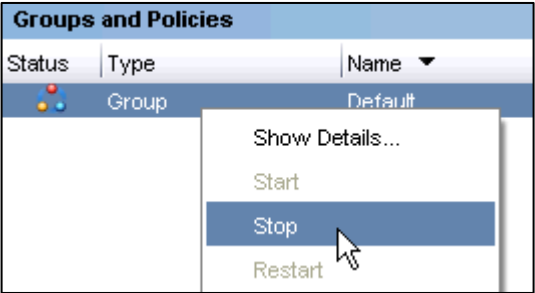


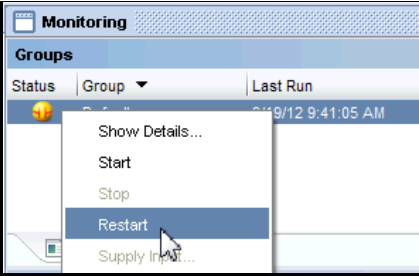
## Lab Exercise 4-2: Perform Backups Using NetWorker Administration

Step	Action
1	<p>Change the <b>Save set</b> attribute of the client resources to prevent the entire disks from being backed up. Change only the client resources that currently have a save set of <b>All</b>.</p> <p>From NetWorker Administration on <b>nwwindows.emc.edu</b>, open the <b>Configuration</b> tab and highlight the <b>Clients</b> node in the left pane.</p> <p>Right-click your NetWorker server in the <b>Clients</b> list and click <b>Modify Client Properties</b>.  <u>Note:</u> Make sure to select the NetWorker server's client resource that has a save set of <b>All</b>.</p>  <p>The screenshot shows the NetWorker Administration console. On the left is a tree view with nodes like Archive Requests, Clients, Clones, Directives, Groups, Local Hosts, Lockboxes, Notifications, Probes, and Registrations. The 'Clients' node is selected. On the right, a table lists clients: 'nwwindows.emc.edu' and 'winclient.emc.edu'. A context menu is open over the 'nwwindows.emc.edu' entry, showing options: 'New Client Wizard' (Ctrl-W), 'Modify Client Wizard' (Ctrl-M), 'New Client Properties' (Ctrl-N), and 'Modify Client Properties...' (Ctrl-O). The 'Modify Client Properties...' option is highlighted by the mouse.</p>
2	<p>For the <b>Save set</b> attribute, replace <b>All</b> with the following save set by typing it in the <b>Save Set</b> window.</p> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;"> <p><u>Linux NetWorker Server</u></p> <p><b>/nsr</b></p> </div> <div style="text-align: center;"> <p><u>Windows NetWorker Server</u></p> <p><b>C:\Program Files\EMC NetWorker</b></p> </div> </div>  <p>The screenshot shows the 'Client Properties - nwwindows.emc.edu' dialog box. The 'General' tab is active. Under the 'Identity' section, the 'Name' field contains 'nwwindows.emc.edu'. Under the 'Backup' section, 'Scheduled backup' and 'Client direct' are checked. The 'Save set' field is set to 'C:\Program Files\EMC NetWorker'.</p> <p>Click <b>OK</b> to save your changes.</p>

Step	Action
3	<p>Modify the save set attribute for <b>winclient.emc.edu</b>. Right-click <b>winclient.emc.edu</b> in the <b>Clients</b> list and click <b>Modify Client Properties</b>.</p> <p>For the <b>Save set</b> attribute, replace <b>All</b> with the following save sets:</p> <pre> Winclient C:\WUTemp\inf C:\WUTemp\Common Files C:\WUTemp\Java </pre> <p>Click <b>OK</b> to save the changes.</p>  <p><b>Note:</b> Ensure that you have three separate save sets listed. If using the save set browse wizard, it may consolidate the save sets to just C:\WUTemp if all subfolders are selected. If this happens change the save set to ensure you have three separate save sets listed.</p>
4	<p>You should now see the client resources with the modified Save set attributes.</p>  <p><b>Note:</b> Do NOT use, copy, or modify the NetWorker client resource with “NMCASA” in the save set name until specifically directed to do so in later labs.</p>


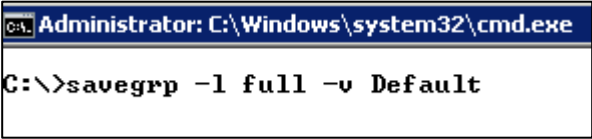

Step	Action
5	<p>Modify the <b>Default</b> group to ensure it always performs a <b>Full</b> backup. To do this, click <b>Groups</b> in the left pane of the <b>Configuration</b> tab, double-click <b>Default</b> in the right pane, and go to the <b>Advanced</b> tab.</p> <p>Set the following two attributes:</p> <ul style="list-style-type: none"> <li>• <u>Level</u>: <b>full</b></li> <li>• <u>Force Incremental</u>: <b>uncheck</b> the box</li> </ul>  <p>Click <b>OK</b> to save the changes.</p>
6	<p>From the <b>Monitoring</b> tab, right-click the <b>Default</b> group and select <b>Start</b>, to start a backup of the Default group.</p>  <p>Reply <b>Yes</b> to the pop-up message.</p>

Step	Action																																																						
7	<p>Review the save group details for the Default group after the backup has completed.</p> <p>From the <b>Monitoring</b> tab, double-click <b>Default</b> in the Group column.</p> <p>Ensure that all save sets show <b>completed successfully</b> and there are no save sets listed in the failed section.</p>  <p>The screenshot shows the 'Default Details' dialog box with the following information:</p> <ul style="list-style-type: none"> <li>Start Time: 9/27/13 2:22:53 PM (checked)</li> <li>Status: Succeeded</li> <li>Percentage Complete: 100%</li> <li>Duration: 00:02:15</li> <li>Total Amount: 810 MB</li> <li>Waiting to Run: (Empty table)</li> <li>Currently Running: (Empty table)</li> <li>Completed Successfully: <table border="1" data-bbox="414 856 1425 1050"> <thead> <tr> <th>Client Name</th> <th>Save Set</th> <th>Level</th> <th>Type</th> <th>Start Time</th> <th>Duration</th> <th>Size</th> <th>File Co...</th> <th>Mess...</th> </tr> </thead> <tbody> <tr> <td>nwwindows....</td> <td>nwwindows.emc.e...</td> <td>full</td> <td></td> <td>9/27/13 2:25:01 PM</td> <td>00:00:06</td> <td>138 KB</td> <td>150</td> <td>8670...</td> </tr> <tr> <td>nwwindows....</td> <td>nwwindows.emc.e...</td> <td>full</td> <td></td> <td>9/27/13 2:24:27 PM</td> <td>00:00:05</td> <td>113 KB</td> <td>4</td> <td>8670...</td> </tr> <tr> <td>nwwindows....</td> <td>C:\Program Files\EM...</td> <td>full</td> <td></td> <td>9/27/13 2:23:16 PM</td> <td>00:01:01</td> <td>564 MB</td> <td>1099</td> <td>8670...</td> </tr> <tr> <td>winclient.em...</td> <td>winclient.emc.edu.i...</td> <td>full</td> <td></td> <td>9/27/13 2:25:00 PM</td> <td>00:00:02</td> <td>245 KB</td> <td>6</td> <td>8670...</td> </tr> <tr> <td>winclient.em...</td> <td>C:\WUTemp\inf</td> <td>full</td> <td></td> <td>9/27/13 2:23:55 PM</td> <td>00:00:57</td> <td>116 MB</td> <td>1510</td> <td>wincl...</td> </tr> </tbody> </table> </li> </ul>	Client Name	Save Set	Level	Type	Start Time	Duration	Size	File Co...	Mess...	nwwindows....	nwwindows.emc.e...	full		9/27/13 2:25:01 PM	00:00:06	138 KB	150	8670...	nwwindows....	nwwindows.emc.e...	full		9/27/13 2:24:27 PM	00:00:05	113 KB	4	8670...	nwwindows....	C:\Program Files\EM...	full		9/27/13 2:23:16 PM	00:01:01	564 MB	1099	8670...	winclient.em...	winclient.emc.edu.i...	full		9/27/13 2:25:00 PM	00:00:02	245 KB	6	8670...	winclient.em...	C:\WUTemp\inf	full		9/27/13 2:23:55 PM	00:00:57	116 MB	1510	wincl...
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8	<p>Perform another backup of the <b>Default</b> group and <b>abort</b> the group after at least one of the save set finishes. Use <b>Show Details</b> to determine the save set status.</p> <p>To stop the group, use the same menu used to start the group.</p>  <p>The screenshot shows the 'Groups and Policies' dialog box with the following information:</p> <ul style="list-style-type: none"> <li>Group: Default</li> <li>Context menu options: Show Details..., Start, Stop (highlighted), Restart</li> </ul>																																																						

Step	Action																																																																																	
9	<p><b>Double-click</b> the group to view the details of the group and verify that not all save sets were backed up successfully.</p> <div data-bbox="347 302 1495 709" style="border: 1px solid black; padding: 5px;"> <p>Completed Successfully:</p> <table border="1"> <thead> <tr> <th>Client Name</th> <th>Save Set</th> <th>Level</th> <th>Type</th> <th>Start Time</th> <th>Duration</th> <th>Size</th> <th>File Co...</th> <th>Messages</th> </tr> </thead> <tbody> <tr> <td>nwwindows...</td> <td>nwwindows.emc.e...</td> <td>full</td> <td></td> <td>9/27/13 2:46:10 PM</td> <td>00:00:05</td> <td>225 KB</td> <td>5</td> <td>86705:s...</td> </tr> <tr> <td>nwwindows...</td> <td>C:\Program Files\EM...</td> <td>full</td> <td></td> <td>9/27/13 2:44:51 PM</td> <td>00:01:03</td> <td>564 MB</td> <td>1112</td> <td>86705:s...</td> </tr> <tr> <td>winclient.em...</td> <td>C:\WJUTemp\Java</td> <td>full</td> <td></td> <td>9/27/13 2:45:58 PM</td> <td>00:00:22</td> <td>100 MB</td> <td>651</td> <td>winclient...</td> </tr> <tr> <td>winclient.em...</td> <td>C:\WJUTemp\Commo...</td> <td>full</td> <td></td> <td>9/27/13 2:45:03 PM</td> <td>00:00:56</td> <td>28 MB</td> <td>271</td> <td>winclient...</td> </tr> </tbody> </table> <p>Failed:</p> <table border="1"> <thead> <tr> <th>Client Name</th> <th>Save Set</th> <th>Level</th> <th>Type</th> <th>Start Time</th> <th>Duration</th> <th>Messages</th> </tr> </thead> <tbody> <tr> <td>winclient.em...</td> <td>C:\WJUTemp\inf</td> <td>full</td> <td></td> <td>9/27/13 2:45:29 PM</td> <td>00:00:56</td> <td>Termination request was sen...</td> </tr> </tbody> </table> </div>	Client Name	Save Set	Level	Type	Start Time	Duration	Size	File Co...	Messages	nwwindows...	nwwindows.emc.e...	full		9/27/13 2:46:10 PM	00:00:05	225 KB	5	86705:s...	nwwindows...	C:\Program Files\EM...	full		9/27/13 2:44:51 PM	00:01:03	564 MB	1112	86705:s...	winclient.em...	C:\WJUTemp\Java	full		9/27/13 2:45:58 PM	00:00:22	100 MB	651	winclient...	winclient.em...	C:\WJUTemp\Commo...	full		9/27/13 2:45:03 PM	00:00:56	28 MB	271	winclient...	Client Name	Save Set	Level	Type	Start Time	Duration	Messages	winclient.em...	C:\WJUTemp\inf	full		9/27/13 2:45:29 PM	00:00:56	Termination request was sen...																						
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10	<p><b>Right-click</b> the <b>Default</b> group and select <b>Restart</b>. When prompted select <b>yes</b> and allow the group to complete.</p> <div data-bbox="711 869 1127 1142" style="border: 1px solid black; padding: 5px;">  </div>																																																																																	
11	<p><b>Right-click</b> the group and select <b>Show Details</b> to verify that the group completed successfully.</p> <p><u>Note:</u> Only the save sets that had not completed successfully when the group was stopped were run. Save sets that had already completed prior to stopping the group were not rerun.</p> <div data-bbox="444 1373 1398 1682" style="border: 1px solid black; padding: 5px;"> <p>Completed Successfully:</p> <table border="1"> <thead> <tr> <th>Client Name</th> <th>Save Set</th> <th>Level</th> <th>Type</th> <th>Start Time</th> <th>Duration</th> <th>Size</th> <th>File Co...</th> <th>Mess...</th> </tr> </thead> <tbody> <tr> <td>nwwindows...</td> <td>C:\Program Files\EM...</td> <td>full</td> <td></td> <td>9/27/13 2:44:51 PM</td> <td>00:01:03</td> <td>564 MB</td> <td>1112</td> <td>8670...</td> </tr> <tr> <td>nwwindows...</td> <td>nwwindows.emc.e...</td> <td>full</td> <td></td> <td>9/27/13 2:46:10 PM</td> <td>00:00:05</td> <td>225 KB</td> <td>5</td> <td>8670...</td> </tr> <tr> <td>nwwindows...</td> <td>nwwindows.emc.e...</td> <td>full</td> <td></td> <td>9/27/13 2:54:40 PM</td> <td>00:00:05</td> <td>144 KB</td> <td>150</td> <td>8670...</td> </tr> <tr> <td>nwwindows...</td> <td>nwwindows.emc.e...</td> <td>full</td> <td></td> <td>9/27/13 2:53:47 PM</td> <td>00:00:03</td> <td>225 KB</td> <td>5</td> <td>8670...</td> </tr> <tr> <td>winclient.em...</td> <td>C:\WJUTemp\Commo...</td> <td>full</td> <td></td> <td>9/27/13 2:45:03 PM</td> <td>00:00:56</td> <td>28 MB</td> <td>271</td> <td>wincl...</td> </tr> <tr> <td>winclient.em...</td> <td>C:\WJUTemp\Java</td> <td>full</td> <td></td> <td>9/27/13 2:45:58 PM</td> <td>00:00:22</td> <td>100 MB</td> <td>651</td> <td>wincl...</td> </tr> <tr> <td>winclient.em...</td> <td>winclient.emc.edu:i...</td> <td>full</td> <td></td> <td>9/27/13 2:54:38 PM</td> <td>00:00:02</td> <td>489 KB</td> <td>9</td> <td>8670...</td> </tr> <tr> <td>winclient.em...</td> <td>C:\WJUTemp\inf</td> <td>full</td> <td></td> <td>9/27/13 2:54:12 PM</td> <td>00:00:18</td> <td>116 MB</td> <td>1510</td> <td>wincl...</td> </tr> </tbody> </table> </div>	Client Name	Save Set	Level	Type	Start Time	Duration	Size	File Co...	Mess...	nwwindows...	C:\Program Files\EM...	full		9/27/13 2:44:51 PM	00:01:03	564 MB	1112	8670...	nwwindows...	nwwindows.emc.e...	full		9/27/13 2:46:10 PM	00:00:05	225 KB	5	8670...	nwwindows...	nwwindows.emc.e...	full		9/27/13 2:54:40 PM	00:00:05	144 KB	150	8670...	nwwindows...	nwwindows.emc.e...	full		9/27/13 2:53:47 PM	00:00:03	225 KB	5	8670...	winclient.em...	C:\WJUTemp\Commo...	full		9/27/13 2:45:03 PM	00:00:56	28 MB	271	wincl...	winclient.em...	C:\WJUTemp\Java	full		9/27/13 2:45:58 PM	00:00:22	100 MB	651	wincl...	winclient.em...	winclient.emc.edu:i...	full		9/27/13 2:54:38 PM	00:00:02	489 KB	9	8670...	winclient.em...	C:\WJUTemp\inf	full		9/27/13 2:54:12 PM	00:00:18	116 MB	1510	wincl...
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*End of Lab Exercise 4-2*

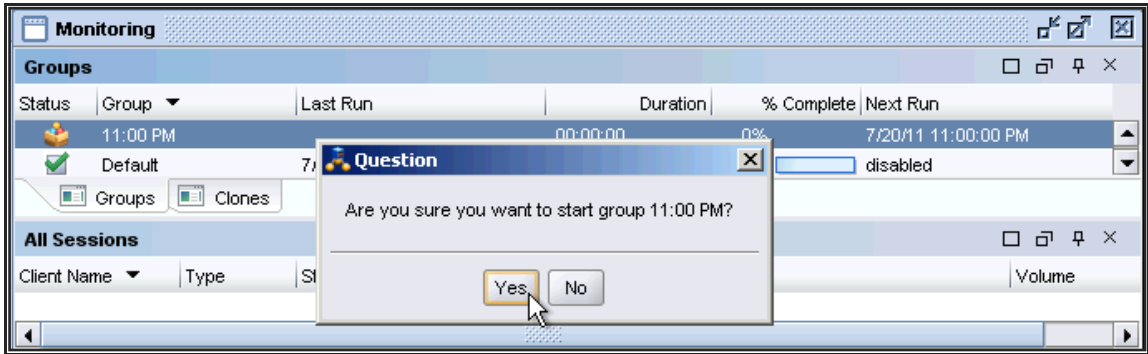
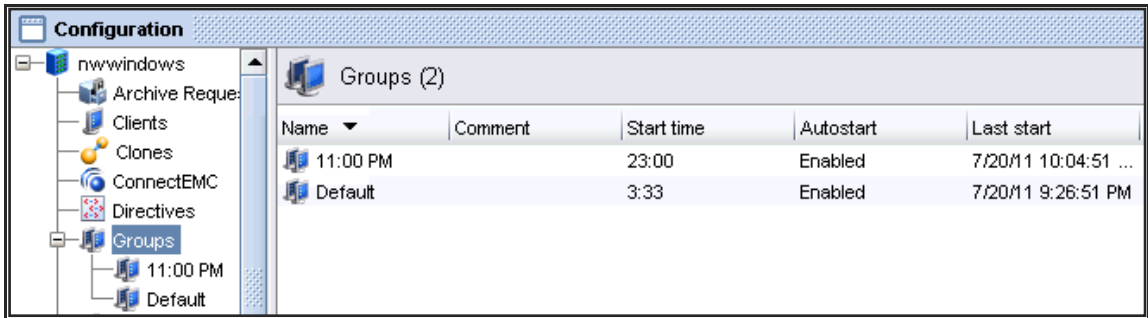
## Lab Exercise 4-3: Perform a Backup Using savegrp

Step	Action
1	<p>Open a <b>command prompt</b> on your <b>NetWorker server</b>.  <u>Note:</u> If you installed the NetWorker server on Linux, do this by opening a putty session to the nwlunix server. If you installed NetWorker server on Windows then just open a command prompt.</p> <p>At the command prompt, run <b>savegrp -p Default</b> for a preview of the backup of the <b>Default</b> group.  <u>Note:</u> Group names are case sensitive.</p> <p>At a command prompt type:   <b>savegrp -p Default</b></p> 
2	<p>Next use the <b>savegrp</b> command to perform a full backup of the <b>Default</b> group.</p> <p>Type: <b>savegrp -l full Default</b></p>  <p><u>Note:</u> While the backup is running, you can monitor it from the <b>Monitoring</b> window of the NetWorker Administration console. Additionally, you can add a <b>-v</b> to the savegrp command to increase the level of verbosity.</p>
3	<p>Validate that the backup <b>completes successfully</b>.</p> 

*End of Lab Exercise 4-3*

## Lab Exercise 4-4: Create New Resources

In this lab, you are presented with a scenario for a data zone configuration. You then configure the NetWorker resources needed to attain that configuration. You will create group, schedule, policy and client resources.

Step	Action
1	Configure all the resources needed to perform the backups requested in the following scenario as detailed in the next pages.
2	<p>Perform a backup of all groups using any method you want. Monitor their progress and verify they finish without error. If any problem occurs, attempt to diagnose and correct the problem, and perform a restart of the group(s) that failed.</p> 
3	<p>Verify that all groups have their <b>Autostart</b> attribute set to <b>Enabled</b> so they will back up automatically during the remainder of the week.</p> 

## Lab Exercise 4-4 SCENARIO

You will be backing up **two** hosts. The first host will be your **NetWorker server**. You will have **two client resources** for this host, in addition to the client resource with the NMC save set. You will modify the existing client resource for your NetWorker server. The second host will be your Windows client (**winclient.emc.edu**). Finally, a third client resource will be created for your NetWorker storage node.

Using the following backup requirements, create or modify resources to configure the data zone. **Before actually doing the configuration, use Table 4-4 on the following page to summarize all the resources that need to be created/configured.**

NetWorker Server (Client Resource #1)	
Save sets (Linux)	/nsr
Save sets (Windows)	C:\Program Files\EMC NetWorker
Backup time	9:00 a.m.
Schedule	Full backup on Monday No backup on Sunday Incremental backup on all other days
Policies	Data must be browsable for one month and recoverable for one year.
Pool	Ensure data is backed up to the <b>Disk1</b> pool

Winclient.emc.edu (Client Resource #2)	
Save sets (Windows)	C:\WUTemp\ , C:\WINDOWS\Help
Backup time	11:00 p.m.
Schedule	Full on the 1 <sup>st</sup> and the 15 <sup>th</sup> of each month Incremental on all other days
Policies	Data must be browsable for 2 months and recoverable for 3 years.
Pool	Ensure data is backed up to the <b>Disk1</b> pool

NetWorker Storage Node (Client Resource #3)	
Save sets (Linux)	/etc
Save sets (Windows)	C:\WINDOWS\Help
Backup time	11:00 p.m.
Schedule	Level 1 each Thursday A Full backup is needed on the 3 <sup>rd</sup> Friday of every month Incremental on all other days
Policies	Data must be browsable for one month and recoverable for two months.
Pool	Ensure data is backed up to the <b>Disk1</b> pool.

## Lab Exercise 4-4 Worksheet

(If desired, remove this page and fill in during the lab.)

	Client #1 (NetWorker Server)	Client #2 (Winclient.emc.edu)	Client #3 (NetWorker SN)
Client Name			
Save sets			
Group			
Schedule			
Browse Policy			
Retention Policy			

Table 4-4: Summary of Client Resource Information

(Use a '\*' to designate a resource that must be created.)

## Lab Exercise 4-4 Solutions

### Client Resource Information

	Client #1 (NetWorker Server)	Client #2 (Winclient.emc.edu)	Client #3 (NetWorker SN)
Save sets ( <u>Windows NW Server</u> )	C:\Program Files\EMC NetWorker	C:\WUTemp C:\WINDOWS\Help	/etc
Save sets ( <u>Linux NW Server</u> )	/nsr		C:\WINDOWS\Help
Group	NSRBackup ***	11PM ***	11PM ***
Schedule	Full on Monday ***	Full on 1st and 15th ***	Full on 3rd Friday ***
Browse Policy	Month	2 Months ***	Month
Retention Policy	Year	3 Years***	2 Months ***

( '\*\*\*' - designates a resource that must be created prior to configuring the client resource)

## Lab Exercise 4-4 Solution Steps

### Action

All resources are configured using the **Configuration** and **Media** tabs in the **NetWorker Administration** interface.

Note: The names listed below for groups, schedules, and policies were selected as representative names for the resources. You may choose different names if you desire, however, it is important that you remember which of your chosen names relate to the names used in the labs. The lab guide will always reference the resources by the representative names below.

#### Group: NSRBackup

From the **Configuration** tab right-click **Groups** in the left pane and select **New**.

**Create Group** window > **Setup** tab:

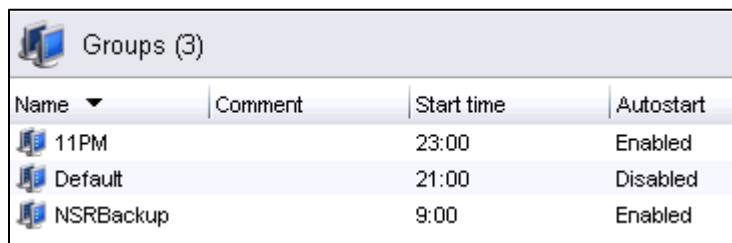
- Name: **NSRBackup**
- Start time: **9:00**
- Autostart: **Enabled**

#### Group: 11PM

Right-click **Groups** in the left pane and select **New**.

**Create Group** window > **Setup** tab:

- Name: **11PM**
- Start time: **23:00**
- Autostart: **Enabled**

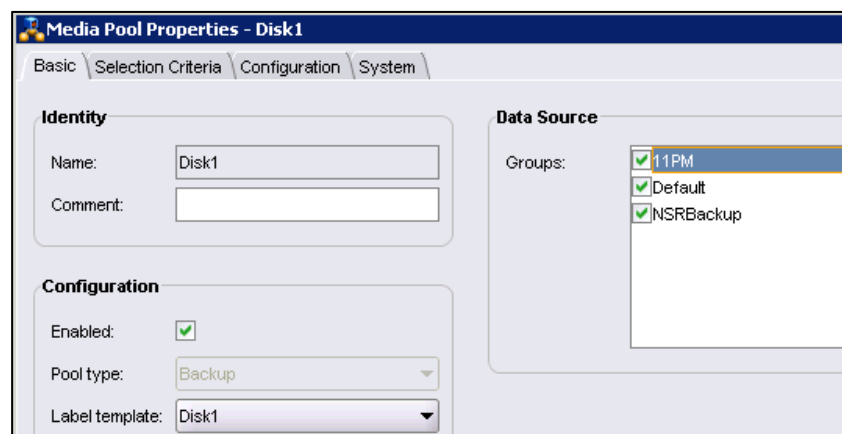


Name	Comment	Start time	Autostart
11PM		23:00	Enabled
Default		21:00	Disabled
NSRBackup		9:00	Enabled

#### Pool: Disk1

From the **Media** tab, select **Media Pools** and double-click the **Disk1** pool to open its properties.

In the **Data Source** field, select the **two** newly created groups so that **all groups** are selected for this pool.



**Media Pool Properties - Disk1**

Basic | Selection Criteria | Configuration | System

**Identity**

Name: Disk1

Comment:

**Configuration**

Enabled:

Pool type: Backup

Label template: Disk1

**Data Source**

Groups:

- 11PM
- Default
- NSRBackup

Click **OK**.

**Schedule: Full on Monday**

On the **Configuration** tab, Right-click **Schedules** in left pane and create a **New** schedule with the following:

**Create Schedule** window:

- **Name:** Full on Monday
- **Period:** Week
- Right-click any **Sunday** -> **Set Level** -> **Skip**
- Right-click any **Monday** -> **Set Level** -> **Full**

**Create Schedule**

Name: Full on Monday

Period: Week

Comment:

September 2013 September 27, 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 Skip	2 Full	3 Incremental	4 Incremental	5 Incremental	6 Incremental	7 Incremental
8 Skip	9 Full	10 Incremental	11 Incremental	12 Incremental	13 Incremental	14 Incremental
15 Skip	16 Full	17 Incremental	18 Incremental	19 Incremental	20 Incremental	21 Incremental
22 Skip	23 Full	24 Incremental	25 Incremental	26 Incremental	27 Incremental	28 Incremental
29 Skip	30 Full					

? OK Reset Cancel

Click **OK**.

**Schedule: Full on 1st and 15th****Create Schedule** window:

- **Name:** Full on 1st and 15th
- **Period:** Month
- Right-click the **15th** > **Set Level** > **Full**
- Right-click the **8th** > **Set Level** > **5**
- Right-click the **22nd** > **Set Level** > **5**

**Create Schedule**

Name:

Period:

Comment:

September 2013 September 27, 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 Full	2 Incremental	3 Incremental	4 Incremental	5 Incremental	6 Incremental	7 Incremental
8 5	9 Incremental	10 Incremental	11 Incremental	12 Incremental	13 Incremental	14 Incremental
15 Full	16 Incremental	17 Incremental	18 Incremental	19 Incremental	20 Incremental	21 Incremental
22 5	23 Incremental	24 Incremental	25 Incremental	26 Incremental	27 Incremental	28 Incremental
29 Incremental	30 Incremental					

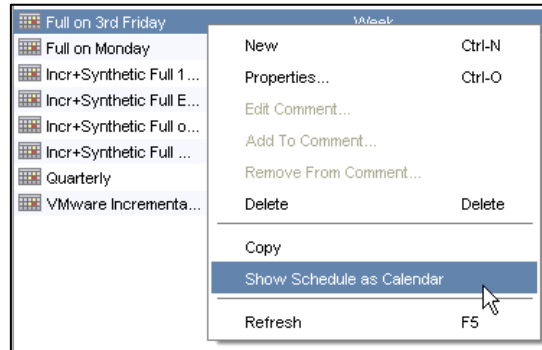
Buttons:

Click **OK**.

**Full Schedule: Full on 3rd Friday****Create Schedule** window:

- Name: **Full on 3rd Friday**
- Period: **Week**
- Click **ok** to save schedule

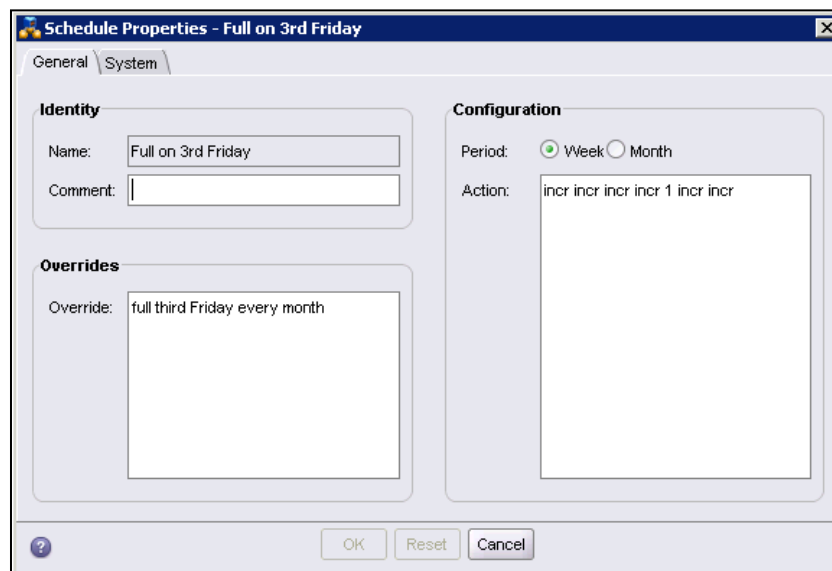
From the list of schedules, right-click your newly created schedule and **uncheck** the option **show schedule as calendar**



Right-click **Full on 3rd Friday** schedule and select **properties** to make the following changes:

**Schedule Properties** window:

- Action: **incr incr incr incr 1 incr incr**
- Override: **full third Friday every month**



Click **OK**.

**Note:** The method for schedule creation shown in this step is particularly useful for the creation of complex schedules that need to repeat over consecutive years. Any option supported by `nsr_get_date` can be used in the override section

**Time Policy: 2 Months**

Right-click **Time Policies** in left pane and create a **New** time policy with the following attributes:

**Create Policy** window:

- Name: **2 Months**
- Number of periods: **2**
- Period: **Months**



Click **OK**.

**Time Policy: 3 Years**

**Create Policy** window:

- Name: **3 Years**
- Number of periods: **3**
- Period: **Years**

Click **OK**.

Time Policies (8)			
Name ▼	Comment	Number of periods	Period
 2 Months		2 <input type="text"/>	Months
 3 Years		3 <input type="text"/>	Years

**Client: Client #1 (NetWorker Server)**

From the **Configuration** tab, click **Clients** in the left pane and double-click the existing client (**not** the GST client) in the right pane.

Choose the save sets to back up by clicking **Browse** in the client **Properties** window, **General** tab and selecting the directories from the **Choose Directory** window.

- Save Set:
  - Linux NW Server: **/nsr**
  - Windows NW Server: **C:\Program Files\EMC NetWorker**
- Schedule: **Full on Monday**
- Group: **NSRBackup** only

Click **OK**.

**Client: Client #2 (winclient.emc.edu)**

**Right-click** the **winclient.emc.edu** client and select **Modify Client Properties**.

- Save Set:
  - C:\WUTemp**
  - C:\Windows\Help**
- Browse policy: **2 Months**
- Retention policy: **3 Years**
- Backup Schedule: **Full on 1st and 15th**
- Group: **11PM** only
- Pool: **Disk1**

Click **OK**.

**Client: Client #3 (NW Storage Node)**

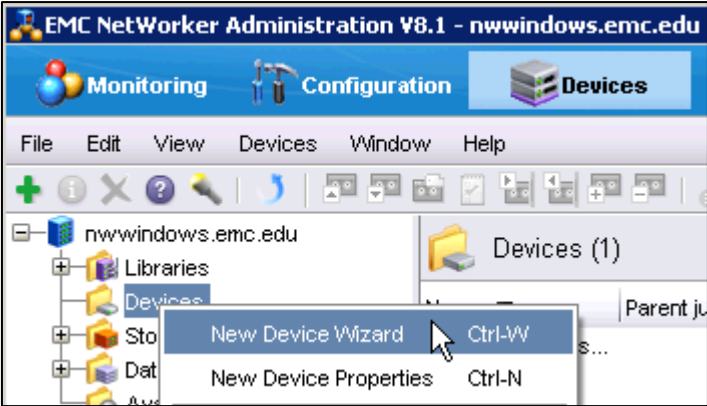
**Right-click Clients** in the left pane and select **New Client Wizard**.

- Name: **nwlinux.emc.edu** or **nwwindows.emc.edu**
- Target Pool: **Disk1**
- Save set:
  - Linux Storage Node: **/etc**
  - Windows Storage Node: **C:\WINDOWS\Help**
- Browse policy: **Month**
- Retention policy: **2 Months**
- Schedule: **Full on 3rd Friday**
- Group: **11PM** only

Click **Create**.

*End of Lab Exercise 4-4*

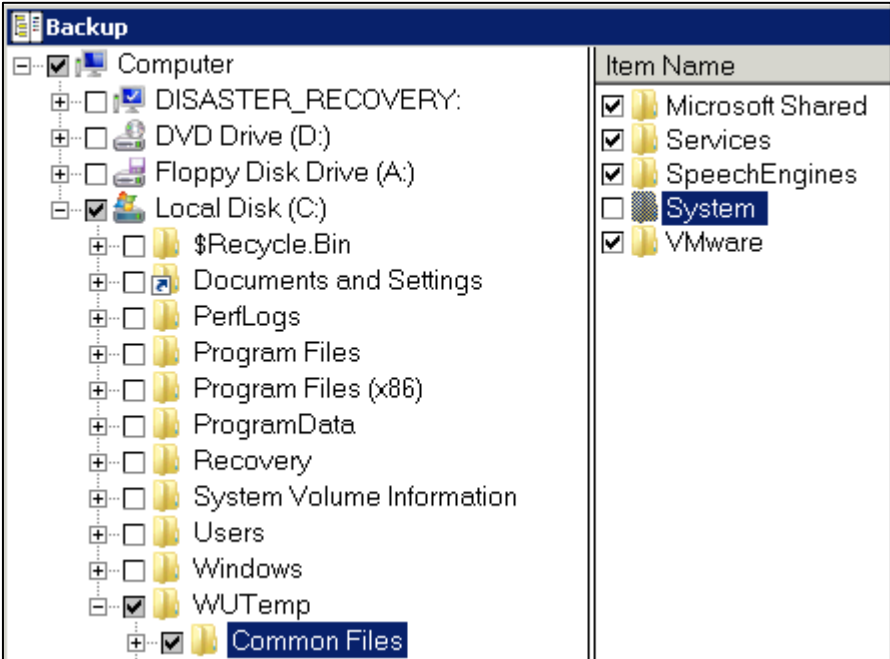

## Lab Exercise 4-5: Perform Client-initiated Backups Using NetWorker User


Step	Action
1	<p>Backups run manually from the NetWorker client are considered a level M or Manual level backup and are treated differently than scheduled backups.</p> <p>To ensure these backups go to a pool other than Default, a new pool is created and configured specifically for manual backups.</p> <p>From the <b>Device</b> tab, right-click <b>Devices</b> and launch the <b>New Device Wizard</b></p>  <p>The screenshot shows the EMC NetWorker Administration V8.1 interface. The title bar reads 'EMC NetWorker Administration V8.1 - nwwindows.emc.edu'. The main window has three tabs: 'Monitoring', 'Configuration', and 'Devices', with 'Devices' selected. Below the tabs is a menu bar with 'File', 'Edit', 'View', 'Devices', 'Window', and 'Help'. A toolbar with various icons is visible. The main area shows a tree view on the left with 'nwwindows.emc.edu' expanded to show 'Libraries', 'Devices', 'Storage', and 'Data'. The 'Devices' folder is selected, and a context menu is open over it, showing 'New Device Wizard' (Ctrl-W) and 'New Device Properties' (Ctrl-N). The 'New Device Wizard' option is highlighted by the mouse cursor.</p>

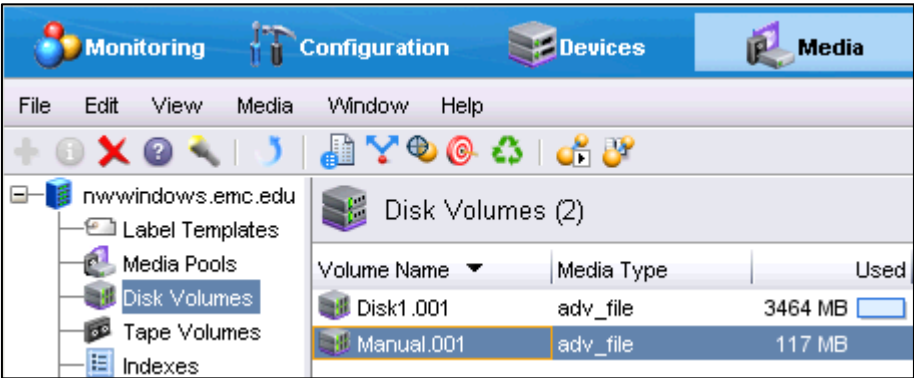
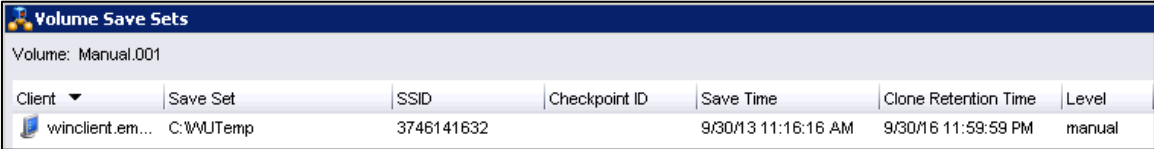
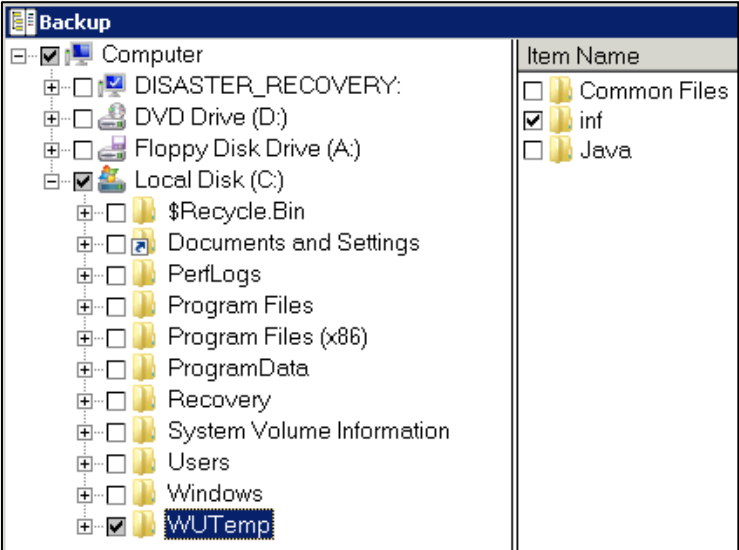
Step	Action						
2	<p>Use the following options to create the new device in the wizard:</p> <p><b>Device Configuration Wizard Options:</b></p> <ul style="list-style-type: none"> <li>• <u>Device Type:</u> <b>Advanced File Type Device (AFTD)</b></li> <li>• <u>Storage Node:</u> <b>Accept default selection of NetWorker Server</b></li> <li>• <u>Device Path:</u> Choose the folder pre-created for you based on your NetWorker server  Linux NetWorker Server: <b>/backupdev/adv_filedev2</b>  Windows NetWorker Server: <b>E:\Adv_filedev2</b></li> </ul> <div data-bbox="656 485 1166 688" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> </div> <ul style="list-style-type: none"> <li>• <u>NetWorker Device Name:</u> <b>&lt;networker_server_name&gt;_AFTD2</b></li> </ul> <div data-bbox="488 800 1333 991" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 2px;">NetWorker Device Name:</td> <td style="padding: 2px;"><input type="text" value="nwwindows_aftd2"/></td> </tr> <tr> <td style="padding: 2px;">Comment:</td> <td style="padding: 2px;"><input type="text"/></td> </tr> <tr> <td style="padding: 2px;">Device Path:</td> <td style="padding: 2px;"><input type="text" value="E:\Adv_filedev2"/></td> </tr> </table> </div> <ul style="list-style-type: none"> <li>• <u>Label and Mount Device after creation:</u> <b>uncheck</b> the box <b>Label and Mount device after creation</b>.</li> </ul> <div data-bbox="483 1136 1352 1362" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <div style="border: 1px solid gray; padding: 5px;"> <input type="checkbox"/> Label and Mount device after creation <p style="font-size: small; margin-top: 5px;"> <span style="color: blue;">i</span> The Label and Mount device operation may take an extended amount of time. </p> <p><b>Pool Type</b></p> <p> <input checked="" type="radio"/> Backup  <input type="radio"/> Backup Clone </p> </div> </div> <p>When presented with the <b>summary page</b>, click <b>Configure</b>, and <b>Finish</b> to complete creation of the device and close the wizard.</p>	NetWorker Device Name:	<input type="text" value="nwwindows_aftd2"/>	Comment:	<input type="text"/>	Device Path:	<input type="text" value="E:\Adv_filedev2"/>
NetWorker Device Name:	<input type="text" value="nwwindows_aftd2"/>						
Comment:	<input type="text"/>						
Device Path:	<input type="text" value="E:\Adv_filedev2"/>						

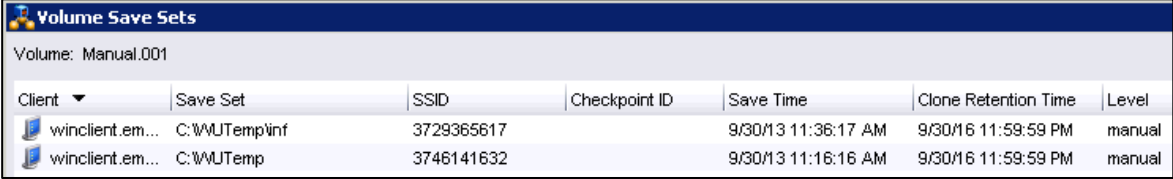
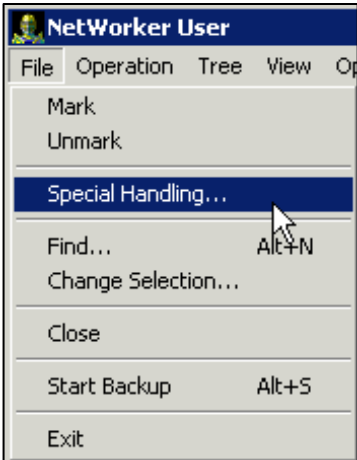

Step	Action
3	<p>On the <b>Media</b> tab, right-click <b>Media Pools</b>, and select <b>New</b></p> <p>Create a new pool with the following attributes:</p> <p><b>Basic Tab</b></p> <ul style="list-style-type: none"> <li>• <u>Name</u>: <b>Manual</b></li> </ul> <p><b>Selection Criteria Tab</b></p> <ul style="list-style-type: none"> <li>• <u>Levels</u>: check the box for <b>manual</b></li> </ul> <div data-bbox="647 480 1170 762" data-label="Image"> <p>A screenshot of a dialog box titled 'Levels:'. It contains a list of options: 4, 5, 6, 7, 8, 9, incr, and manual. The 'manual' option is checked with a green checkmark.</p> </div> <p>Click <b>OK</b>.</p> <p>Click <b>OK</b> again to acknowledge the error box, and click <b>OK</b> again on the Media Pool Creation window.</p> <div data-bbox="647 905 1170 1104" data-label="Image"> <p>An error dialog box with a blue title bar and a close button. The message reads: "No label template selected. Choose one now, or Apply again to have a label template created and selected automatically." There is an 'OK' button at the bottom.</p> </div> <p><u>Result</u>: This automatically creates and applies a label template with the name of the Media Pool.</p>
4	<p>On the <b>Devices</b> tab select <b>Devices</b> from the tree on the left.</p> <p><b>Right-click</b> the <b>newly created</b> device and choose <b>label</b>.</p> <ul style="list-style-type: none"> <li>• <u>Pools</u>: <b>Manual</b></li> </ul> <div data-bbox="686 1375 1133 1749" data-label="Image"> <p>A screenshot of a dialog box titled 'Label'. It has several fields: 'Device' with the value 'nwwindows_aftd2', 'Volume Label' with 'Manual.001', and a 'Pools' dropdown menu set to 'Manual'. There are also checkboxes for 'Manual Recycle' (unchecked) and 'Mount after Labeling' (checked). 'OK' and 'Cancel' buttons are at the bottom.</p> </div> <p>Click <b>OK</b>.</p>

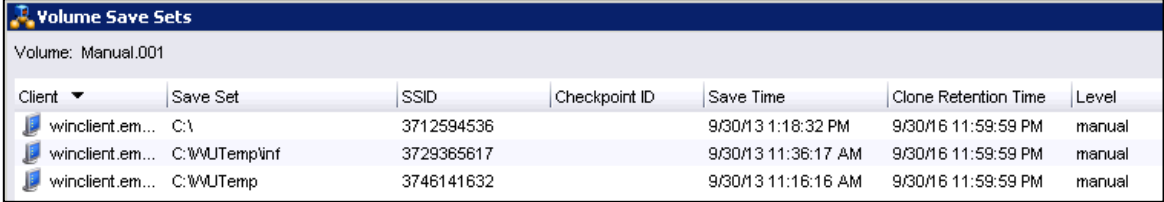
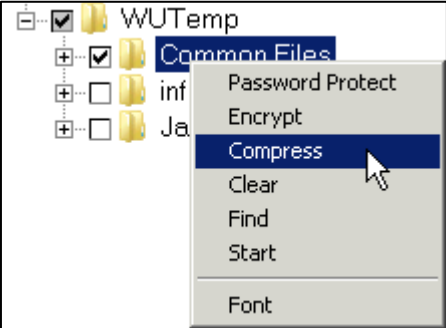
Step	Action
5	<p>Using the Winclient link on the desktop, log in to the Windows client, <b>winclient.emc.edu</b>, with the following credentials:</p> <ul style="list-style-type: none"> <li>• <u>User</u>: <b>WINCLIENT\administrator</b></li> <li>• <u>Password</u>: <b>student</b></li> </ul> <p><b>Launch</b> the <b>NetWorker User</b> application.</p> <p><b>Start &gt; All Programs &gt; EMC NetWorker &gt; NetWorker User</b></p>
6	<p>If the <b>Change Server</b> dialog box is presented, enter the fully qualified name of your NetWorker server.</p> <p><b>NetWorker User – Change Server</b></p> <ul style="list-style-type: none"> <li>• <u>Server</u>: <b>FQDN of NetWorker Server</b></li> <li>• <u>Check the Box</u>: <b>Save as Default Server</b></li> </ul> <div data-bbox="711 745 1101 1003" data-label="Image"> </div> <p>Click <b>OK</b>.</p>
7	<p>Click the <b>Backup</b> icon to display the file selection window.</p> <div data-bbox="597 1192 1218 1423" data-label="Image"> </div>
8	<p>Navigate to <b>C:\WUTemp</b> and <b>mark</b> the <b>Common Files</b> and <b>Java</b> folders for backup.</p> <div data-bbox="690 1543 1128 1753" data-label="Image"> </div>

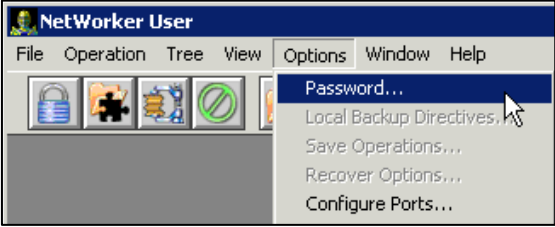
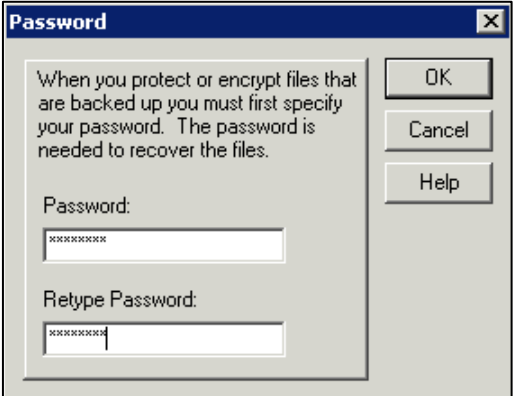
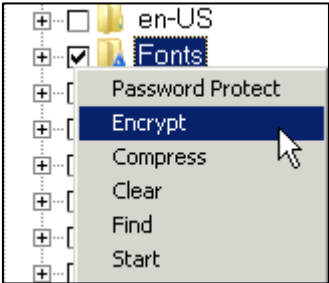
Step	Action
9	<p>Navigate into the C : \WUTemp\Common Files folder and <b>unmark</b> the <b>System</b> folder.</p>  <p>The screenshot shows the Backup software interface. On the left, a tree view shows the file system structure. Under 'Local Disk (C:)', the 'Common Files' folder is selected. On the right, the 'Item Name' list shows several folders with checkboxes: Microsoft Shared (checked), Services (checked), SpeechEngines (checked), System (unchecked and highlighted), and VMware (checked).</p>
10	<p>From NetWorker User, start the backup by <b>clicking</b> the <b>green start</b> icon.</p>  <p>The screenshot shows the NetWorker User interface. At the top, there is a menu bar with 'File', 'Operation', 'Tree', 'View', 'Options', and 'Window'. Below the menu bar is a toolbar with several icons. The 'Start' icon, which is a green arrow pointing up and right, is being clicked by a mouse cursor. Below the toolbar, the 'Backup' window is visible, showing the 'Computer' folder selected and a 'Start' button.</p>

Step	Action
11	<p>Monitor the backup by viewing the <i>Backup Status</i> window.</p> <div data-bbox="553 262 1268 1224" style="border: 1px solid black; padding: 5px;">  <p>The screenshot shows a window titled "Backup Status" with a list of files and folders. The files listed are:</p> <ul style="list-style-type: none"> <li>C:\WUTemp\Java\jre6\lib\zi\System\AST4ADT</li> <li>C:\WUTemp\Java\jre6\lib\zi\System\CST6</li> <li>C:\WUTemp\Java\jre6\lib\zi\System\CST6CDT</li> <li>C:\WUTemp\Java\jre6\lib\zi\System\EST5</li> <li>C:\WUTemp\Java\jre6\lib\zi\System\EST5EDT</li> <li>C:\WUTemp\Java\jre6\lib\zi\System\HST10</li> <li>C:\WUTemp\Java\jre6\lib\zi\System\MST7</li> <li>C:\WUTemp\Java\jre6\lib\zi\System\MST7MDT</li> <li>C:\WUTemp\Java\jre6\lib\zi\System\PST8</li> <li>C:\WUTemp\Java\jre6\lib\zi\System\PST8PDT</li> <li>C:\WUTemp\Java\jre6\lib\zi\System\YST9</li> <li>C:\WUTemp\Java\jre6\lib\zi\System\YST9YDT</li> <li>C:\WUTemp\Java\jre6\lib\zi\System\</li> <li>C:\WUTemp\Java\jre6\lib\zi\WET</li> <li>C:\WUTemp\Java\jre6\lib\zi\ZoneInfoMappings</li> <li>C:\WUTemp\Java\jre6\lib\zi\</li> <li>C:\WUTemp\Java\jre6\lib\</li> <li>C:\WUTemp\Java\jre6\LICENSE</li> <li>C:\WUTemp\Java\jre6\LICENSE.txt</li> <li>C:\WUTemp\Java\jre6\README.txt</li> <li>C:\WUTemp\Java\jre6\THIRDPARTYLICENSEREADME.txt</li> <li>C:\WUTemp\Java\jre6\Welcome.html</li> <li>C:\WUTemp\Java\jre6\</li> <li>C:\WUTemp\Java\</li> <li>C:\WUTemp\</li> <li>C\</li> <li>/</li> </ul> <p>At the bottom of the window, the following text is displayed:</p> <pre>backup: C:\WUTemp 117 MB 00:00:18 849 files 94694:winworkr: The backup of save set 'C:\WUTemp' succeeded. 7167:winworkr: backup completion time: 9/30/2013 8:16:34 AM</pre> <p>A status bar at the very bottom shows: Start time: 9/30/2013 8:15 AM</p> </div> <p>When the backup completes, this window can be used to validate that <b>no</b> files were backed up from the <b>C:\WUTemp\Common Files\System</b> folder which you excluded from the backup.</p>

Step	Action
12	<p>Return to the <b>NetWorker Administration GUI</b> you have open on <b>nwwindows</b>.</p> <p>On the <b>Media</b> tab, select <b>Disk Volumes</b> in the left pane.  <b>Double-click</b> the <b>Manual.001</b> volume to display a list of save sets on the volume.</p>  <p>Note the <b>save set</b> and <b>client name</b>.</p> 
13	<p>Go back to <b>winclient</b> and perform another backup.  This time, <b>only</b> back up the <b>C:\WUTemp\inf</b> folder.</p> 


Step	Action																					
14	<p><b>Verify</b> that the most recent backup was written to the same volume as the first.</p> <p>Notice the save set name from this backup in comparison to the save set name from the previous backup.</p>  <table border="1" data-bbox="328 373 1495 550"> <thead> <tr> <th>Client</th> <th>Save Set</th> <th>SSID</th> <th>Checkpoint ID</th> <th>Save Time</th> <th>Clone Retention Time</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>winclient.em...</td> <td>C:\WUTemp\inf</td> <td>3729365617</td> <td></td> <td>9/30/13 11:36:17 AM</td> <td>9/30/16 11:59:59 PM</td> <td>manual</td> </tr> <tr> <td>winclient.em...</td> <td>C:\WUTemp</td> <td>3746141632</td> <td></td> <td>9/30/13 11:16:16 AM</td> <td>9/30/16 11:59:59 PM</td> <td>manual</td> </tr> </tbody> </table>	Client	Save Set	SSID	Checkpoint ID	Save Time	Clone Retention Time	Level	winclient.em...	C:\WUTemp\inf	3729365617		9/30/13 11:36:17 AM	9/30/16 11:59:59 PM	manual	winclient.em...	C:\WUTemp	3746141632		9/30/13 11:16:16 AM	9/30/16 11:59:59 PM	manual
Client	Save Set	SSID	Checkpoint ID	Save Time	Clone Retention Time	Level																
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winclient.em...	C:\WUTemp	3746141632		9/30/13 11:16:16 AM	9/30/16 11:59:59 PM	manual																
15	<p>Perform another backup, this time select the <b>C:\WUTemp\Common Files</b> and <b>C:\Windows\Fonts</b> folders.</p> <p>Compress all the files being backed up by selecting <b>Special Handling</b> from the <b>File</b> menu.</p> <p><b>Special Handling</b></p> <ul style="list-style-type: none"> <li>Options: <b>Compress</b></li> </ul>   <p>Click <b>OK</b>.</p> <p><b>Initiate</b> the backup and monitor its progress in the <b>Backup Status</b> window.</p>																					

Step	Action																												
16	<p>Once again, look at the contents of the volume to verify that the save set was backed up successfully.</p> <p>Identify the save set from this backup and notice the difference in save set names between the three backups.</p>  <table border="1" data-bbox="332 409 1490 609"> <thead> <tr> <th>Client</th> <th>Save Set</th> <th>SSID</th> <th>Checkpoint ID</th> <th>Save Time</th> <th>Clone Retention Time</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>winclient.em...</td> <td>C:\</td> <td>3712594536</td> <td></td> <td>9/30/13 1:18:32 PM</td> <td>9/30/16 11:59:59 PM</td> <td>manual</td> </tr> <tr> <td>winclient.em...</td> <td>C:\WUTemp\inf</td> <td>3729365617</td> <td></td> <td>9/30/13 11:36:17 AM</td> <td>9/30/16 11:59:59 PM</td> <td>manual</td> </tr> <tr> <td>winclient.em...</td> <td>C:\WUTemp</td> <td>3746141632</td> <td></td> <td>9/30/13 11:16:16 AM</td> <td>9/30/16 11:59:59 PM</td> <td>manual</td> </tr> </tbody> </table> <p>Can you explain why the names of each of the three save sets you backed up are different?</p> <p><u>Note:</u> The name of a save set created by a client-initiated backup is set to the lowest directory in the directory structure which contains all files in the backup.</p>	Client	Save Set	SSID	Checkpoint ID	Save Time	Clone Retention Time	Level	winclient.em...	C:\	3712594536		9/30/13 1:18:32 PM	9/30/16 11:59:59 PM	manual	winclient.em...	C:\WUTemp\inf	3729365617		9/30/13 11:36:17 AM	9/30/16 11:59:59 PM	manual	winclient.em...	C:\WUTemp	3746141632		9/30/13 11:16:16 AM	9/30/16 11:59:59 PM	manual
Client	Save Set	SSID	Checkpoint ID	Save Time	Clone Retention Time	Level																							
winclient.em...	C:\	3712594536		9/30/13 1:18:32 PM	9/30/16 11:59:59 PM	manual																							
winclient.em...	C:\WUTemp\inf	3729365617		9/30/13 11:36:17 AM	9/30/16 11:59:59 PM	manual																							
winclient.em...	C:\WUTemp	3746141632		9/30/13 11:16:16 AM	9/30/16 11:59:59 PM	manual																							
17	<p>Perform another backup of <b>C:\WUTemp\Common Files</b> and <b>C:\WINDOWS\Fonts</b>.</p> <p><u>Before starting the backup:</u></p> <p><b>Compress</b> the <b>C:\WUTemp\Common Files</b> folder by selecting the <b>Common Files</b> folder for backup. Next <b>right-click</b> the folder and select <b>Compress</b> from the menu.</p>  <p><b>Continue</b> to Step 18.</p>																												

Step	Action
18	<p><b>Encrypt</b> the C : \WINDOWS\Fonts folder. In order to do this, you first must set a password. To set the password, click the <b>Options</b> menu and select <b>Password</b>.</p>  <p><b>Password</b> dialog box:</p> <ul style="list-style-type: none"> <li>• <u>P</u>assword: <b>encrypt1</b></li> <li>• <u>R</u>etyp<u>e</u> Password: <b>encrypt1</b></li> </ul>  <p>Click <b>OK</b>.</p>
19	<p><b>Encrypt</b> the C:\WUTemp\Fonts folder by <b>selecting</b> the <b>Fonts</b> folder for backup. Next <b>right-click</b> the folder and select <b>Encrypt</b> from the menu.</p> 
20	<p><b>Initiate</b> the backup and <b>validate</b> its successful <b>completion</b> in the <b>Backup Status</b> window.</p>

*End of Lab Exercise 4-5*

## Lab Exercise 4-6: Using NetWorker Directives

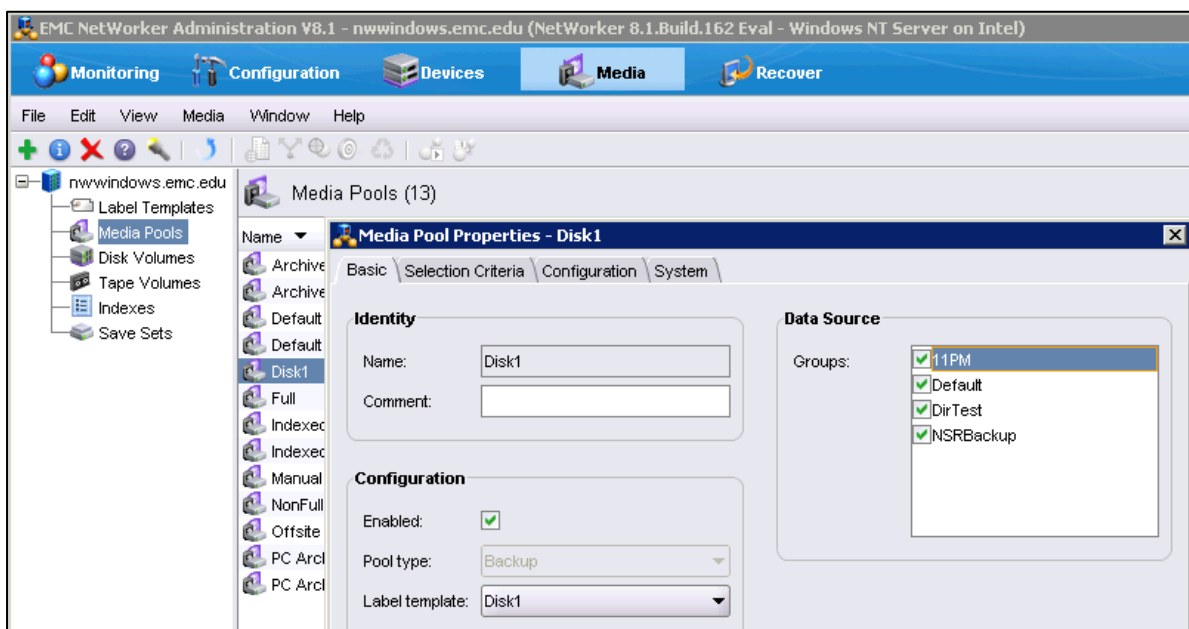
Step	Action
	<p><b>Background:</b> This lab is designed to simulate a common real world scenario often encountered in backup environments.</p> <p><b>Scenario:</b> In this scenario, you have a database instance with two databases that are running on your winclient.emc.edu server. Backups of the databases are going to be performed using a NetWorker module and for the sake of this lab we will pretend that the module backups have already been configured.</p> <p><b>Overview:</b> For this lab, you need to configure filesystem backups of the database directories. Because we don't want to backup data already protected by the simulated NetWorker module, you need to exclude backing up the .dbf (database) files in each of the two database directories. You will use NetWorker directives to skip the two database files while still backing up all of the other files in those directories.</p>
1	<p>From the <b>Configuration</b> tab, <b>right-click Groups</b> and select <b>New</b> to create a new group with the following options:</p> <p><b>Create Group</b></p> <p><b>Setup Tab</b></p> <ul style="list-style-type: none"><li>• <b>Name:</b> DirTest</li></ul> <p><b>Advanced Tab</b></p> <ul style="list-style-type: none"><li>• <b>Level:</b> full</li><li>• <b>Uncheck:</b> Force incremental Box</li></ul>  <p>Click <b>OK</b>.</p>

2 On the **Media** tab select **Media Pools**, and modify the properties of the **Disk1** pool.

**Media Pool Properties**

**Basic Tab**

- Groups: Select **DirTest** so all groups listed are selected to send data to this pool.

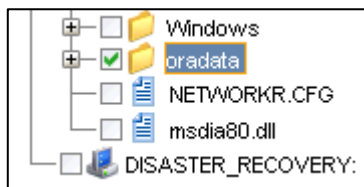


Click **OK**.

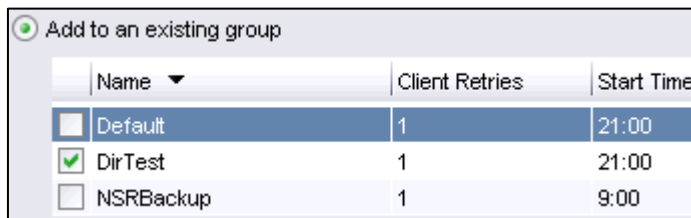
3 Create a **new** client resource for **winclient.emc.edu** accepting the defaults for everything but the following properties:

**Client Backup Configuration**

- Name: **winclient.emc.edu**
- Save sets: **C:\oradata**



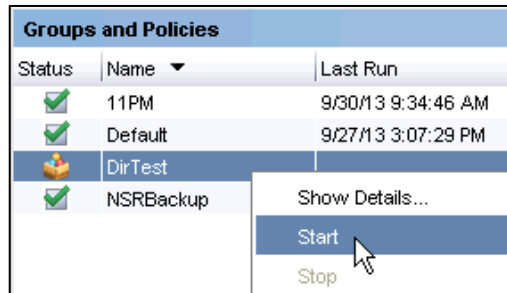
- Group: **DirTest**



Click **configure**, and **Finish** to complete creation of the new client instance.

4

From the **Monitoring** tab, perform a **backup** of the **DirTest** group.



**Note:** This backup included the .dbf files because you have not yet created directives to exclude them. This backup will be used as a baseline to compare consecutive backups against.

5

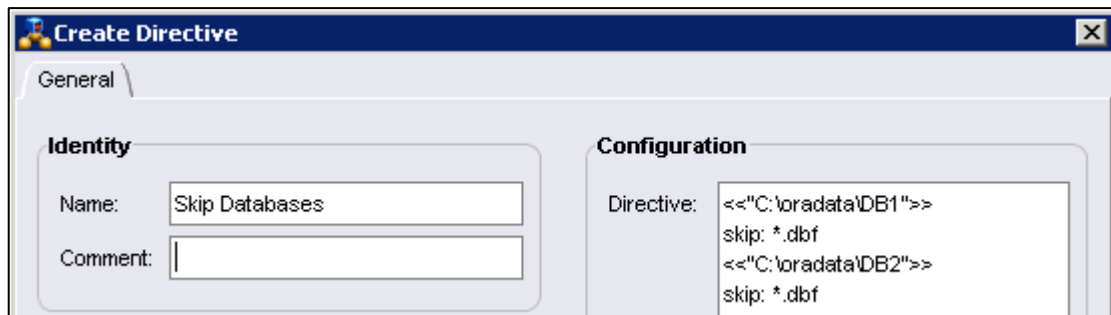
Create a directive to skip the two .dbf files.

From the **Configuration** tab, **right-click Directives** and select **New**. Create a new directive using with the following properties:

#### Create Directive

##### General Tab

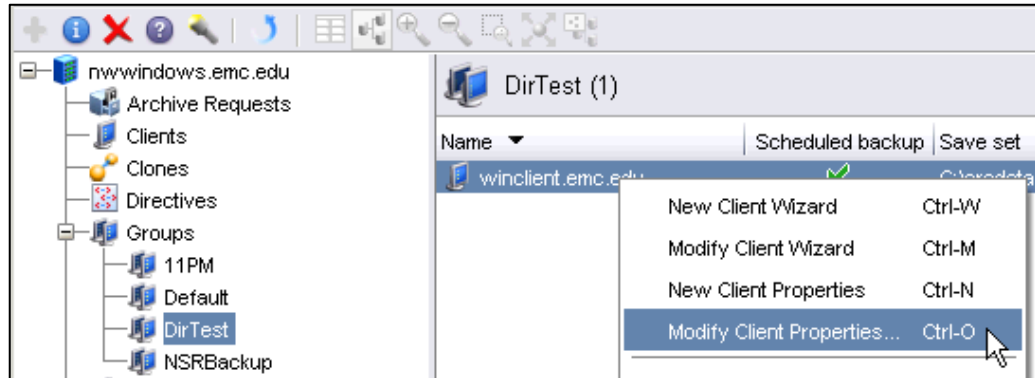
- **Name:** Skip Databases
- **Directive:** <<"C:\oradata\DB1">>  
skip: \*.dbf  
<<"C:\oradata\DB2">>  
skip: \*.dbf



Click **OK**.

**Note:** Be sure that the directive text is entered **exactly** as displayed and on separate lines.

- 6 From the **Configuration** Tab, edit the properties of the **winclient.emc.edu** instance in the **DirTest** Group.



Modify the following attributes:  
**Client Properties – winclient.emc.edu**  
**General Tab**

- Directive: **Skip Databases**

<p><b>Identity</b></p> <p>Name: <input type="text" value="winclient.emc.edu"/></p> <p>Comment: <input type="text"/></p> <p>Backup type: <input type="text" value="Filesystem"/></p> <p><b>Virtualization</b></p>	<p><b>Backup</b></p> <p>Scheduled backup: <input checked="" type="checkbox"/></p> <p>Client direct: <input checked="" type="checkbox"/></p> <p>Block based backup: <input type="checkbox"/></p> <p>Directive: <input type="text" value="Skip Databases"/></p> <p>Save set: <input type="text" value="C:\oradata"/></p>
--	--

Click **OK**.

- 7 From the **Monitoring** tab, run another backup of the **DirTest** group.

Groups and Policies		
Status	Name	Last Run
✓	11PM	9/30/13 9:34
✓	Default	9/27/13 3:07
✓	DirTest	9/30/13 4:41
✓	NSRB	

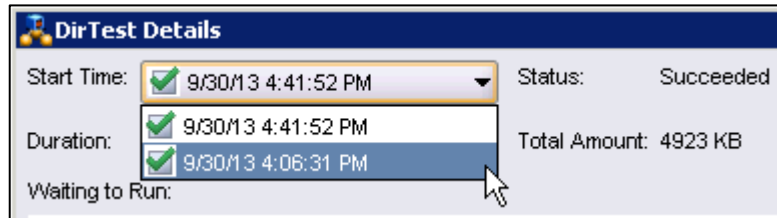
Context menu for DirTest:

- Show Details...
- Start**
- Stop

- 8 **Double-click** the **DirTest** backup group to open the **details window**, if not already open. **Note** the **size** of the **C:\oradata** save set.

Save Set	Level	Type	Start Time	Duration	Size
C:\oradata	full		9/30/13 4:42:18 PM	00:00:04	3538 KB
winclient.emc.edu:index	full		9/30/13 4:42:31 PM	00:00:02	1385 KB

In the **DirTest Details** window click the **Start Time** attribute and select the previously run backup of this group.

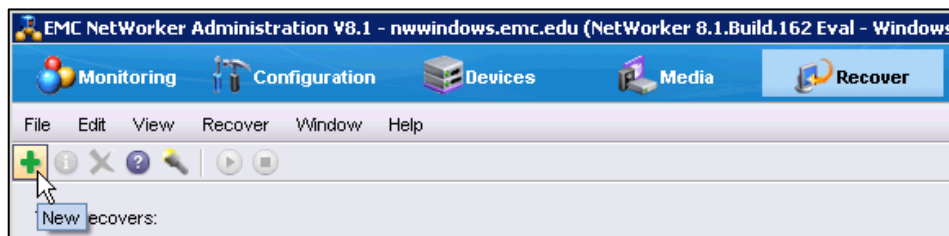


**Note** the **size difference** of the **C:\oradata** save set from the previous backup.

Save Set	Level	Type	Start Time	Duration	Size
winclient.emc.edu:index	full		9/30/13 4:07:37 PM	00:00:05	1383 KB
C:\oradata	full		9/30/13 4:06:57 PM	00:00:30	813 MB

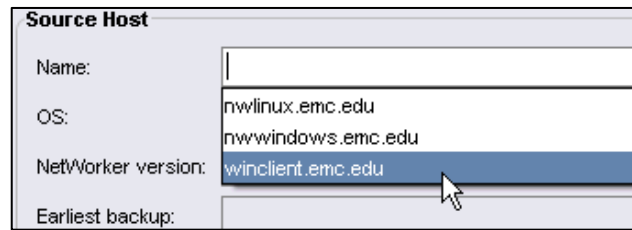
Note: You should see a significant size difference indicating that the two .dbf files in the DB1 and DB2 directories have been skipped. If the size is the same for both backups, repeat the previous steps to configure your directive and ensure that it is typed correctly and properly applied to the correct client.

- 9 You can further validate that only the two .dbf files were skipped by using the Recovery Wizard. **Click** the **Recovery** tab and **select** the **green plus** symbol to open the **recovery wizard**.



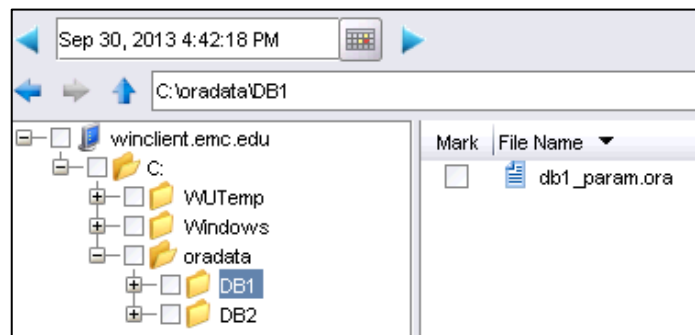
10

Click in the **Name** attribute in the **Source Host** box and select **winclient.emc.edu** from the popup list.

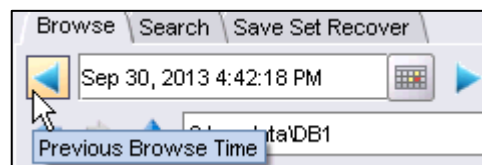


Click **Next** to move to the **Select Data To Recover** section. By default the most recent backup is selected and is browsable using the tree structure on the left side of the window.

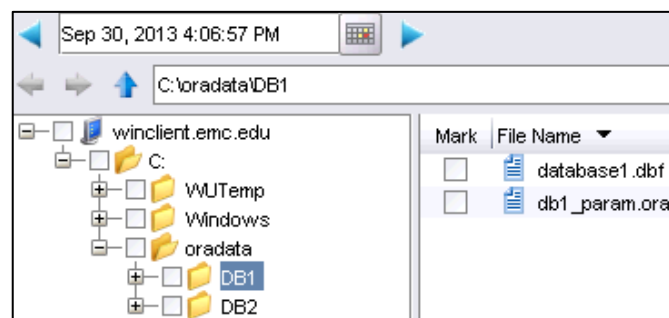
**Expand** the directory structure out until you see the **DB1** and **DB2** directories. **Click** on **DB1**, and **note** that only **one** file is displayed on the **right**. **Repeat** the process for the **DB2** directory.



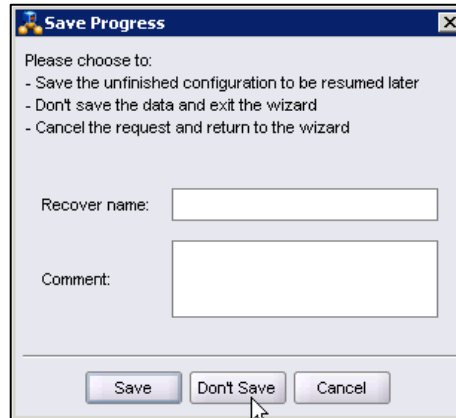
Click the **blue arrow** on the left side of the date box once to **change** to the backup performed prior to configuring the directives.



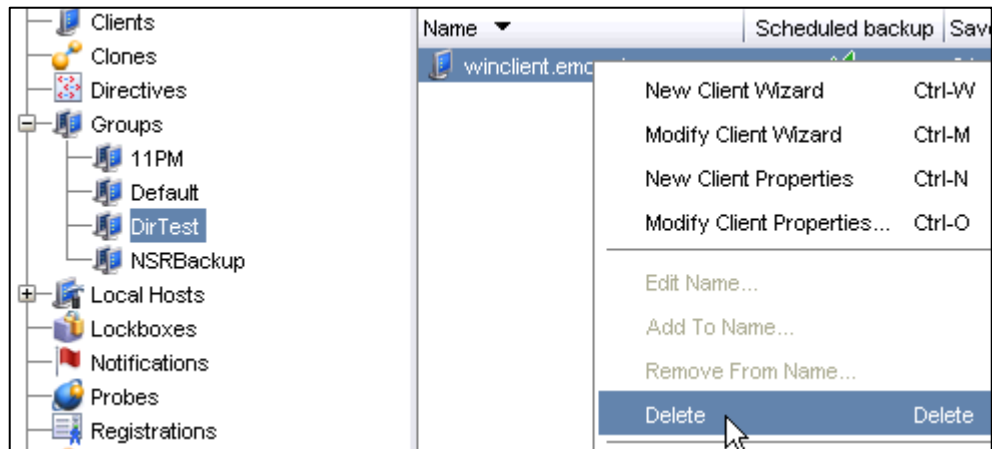
Notice that after changing to the first backup, the **.dbf** files are listed in both the **DB1** and **DB2** directories. This validates that the files were included in the backup prior to configuring the directives and skipped by backups run after applying them.



- 11 Click **Close**, to exit the **Recovery Wizard** and select **Don't Save** when asked if you want to save the recovery session.



- 12 Return to the **Configuration** tab and **delete only** the client instance of **winclient.emc.edu** belonging to the **DirTest** group. It will not be used for any other labs.



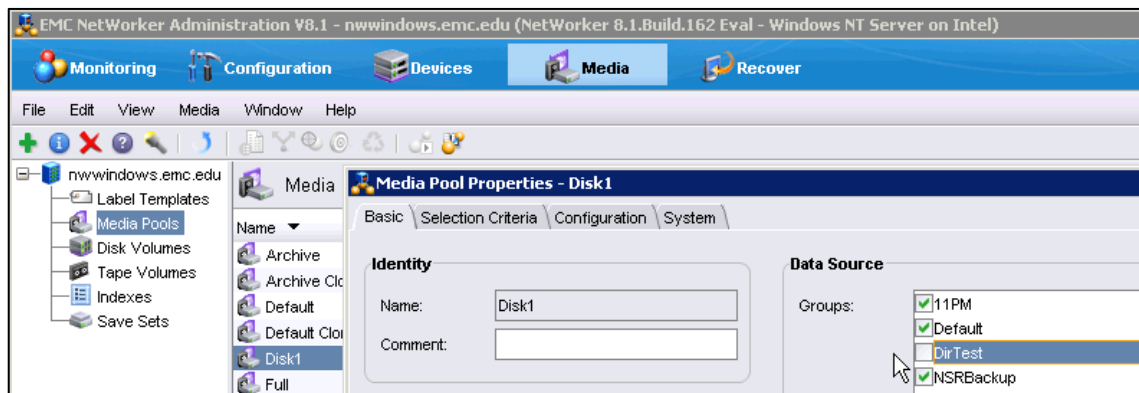
13

On the **Media** tab, open the properties of the **Disk1** media pool and make the following changes:

**Media Pool Properties – Disk1**

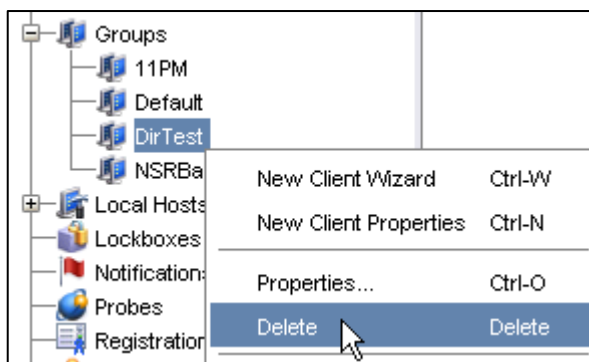
**Basic**

- **Groups:** Uncheck the box next to DirTest



Click **OK** to save the change.

On the **Configuration** tab, **right-click** the **DirTest** group under **Groups** and **delete** it.



Click **Yes** when prompted if you are sure you want to delete this group.

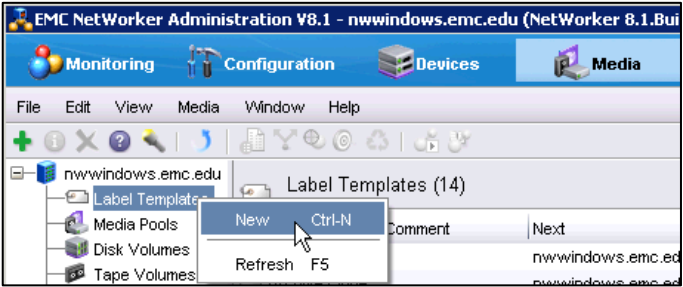
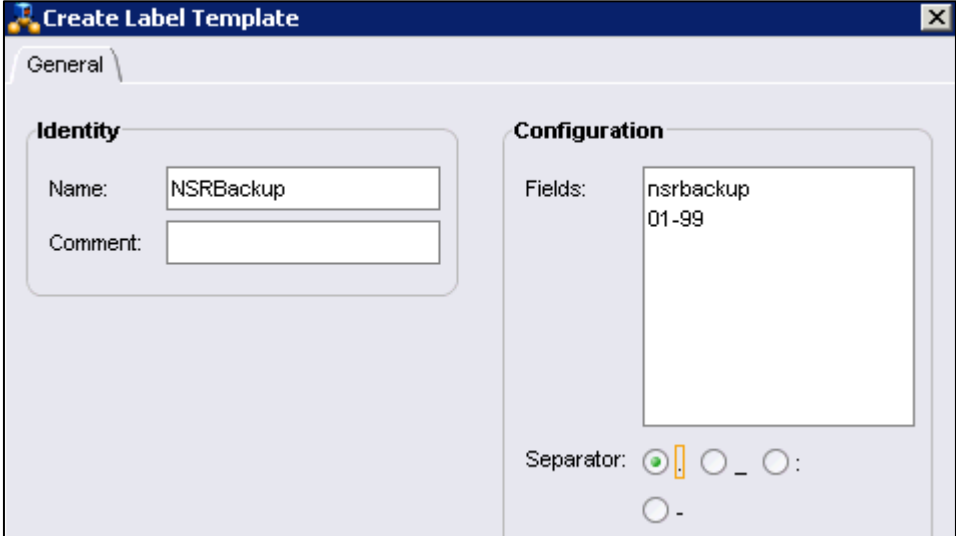
*End of Lab Exercise 4-6*

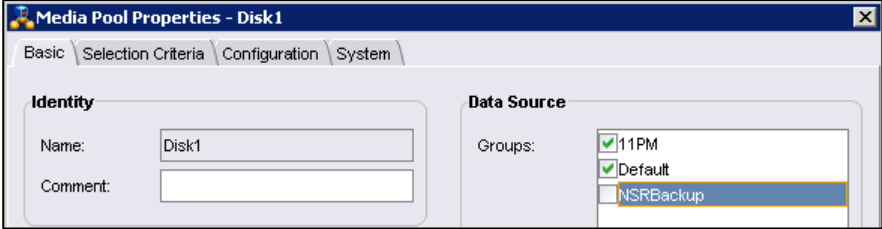
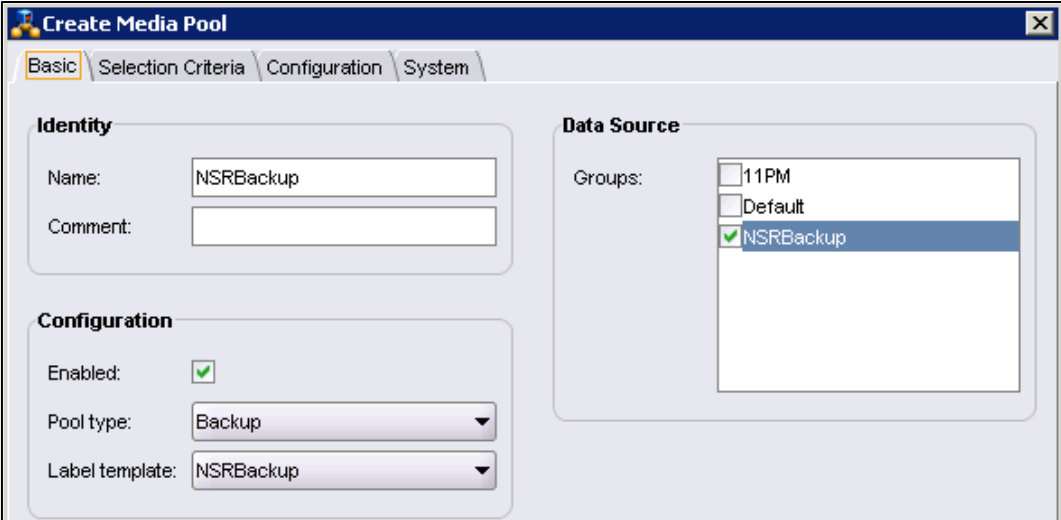
*End of Lab 4*

## Lab 5: Configuring Pools and Label Templates

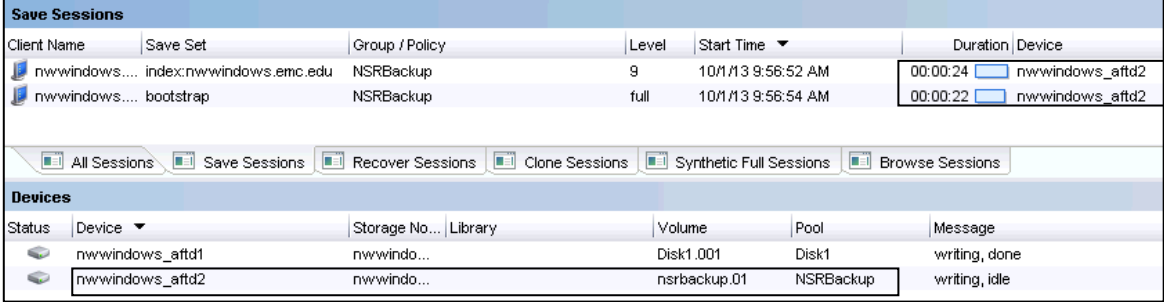
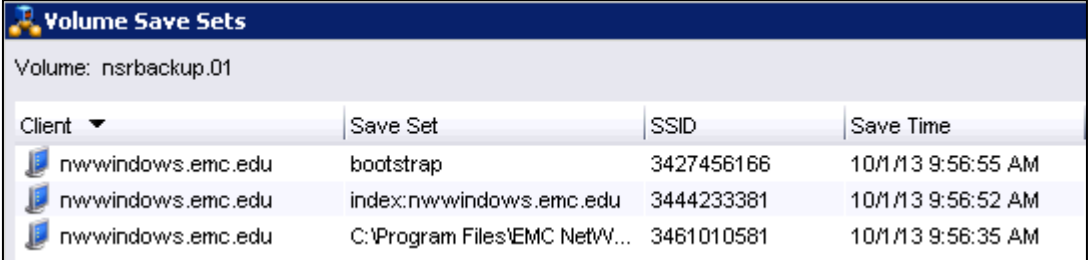
<b>Purpose:</b>	In this lab, you will configure a label template resource for a pool and then configure a pool resource.
<b>Tasks:</b>	In this lab you: <ul style="list-style-type: none"><li>• Create a label template resource.</li><li>• Create a pool resource.</li><li>• Perform a backup to verify the pool is properly configured.</li></ul>

## Lab Exercise 5-1: Configuring Pools and Label Templates

Step	Action
1	<p>From the <b>Media</b> tab, create a new label template by right-clicking <b>Label Templates</b>, and selecting <b>New</b>.</p>  <p>Create a label template with the following properties:</p> <p><b>Create Label Template</b></p> <p><b>General Tab</b></p> <ul style="list-style-type: none"><li>• <u>Name</u>: <b>NSRBackup</b></li><li>• <u>Fields</u>: <b>nsrbackup 01-99</b></li><li>• <u>Seperator</u>: <b>“.”</b></li></ul>  <p>Click <b>OK</b> to create the label template.</p>

Step	Action
2	<p>Before creating your new media pool for the NSRBackup group to use, you must first <b>clear</b> the <b>NSRBackup</b> group from the <b>Disk1</b> pool.</p> <p>From the <b>Media</b> tab select <b>Media Pools</b> and double-click the <b>Disk1</b> pool and make the following changes:</p> <p><b>Media Pool Properties – Disk1</b></p> <p><b>Basic Tab</b></p> <ul style="list-style-type: none"> <li>• <u>Groups:</u> <b>Un-check NSRBackup</b></li> </ul>  <p>Click <b>OK</b>.</p>
3	<p>From the <b>Media</b> tab, right-click <b>Media Pools</b> and create a <b>New</b> media pool with the following properties:</p> <p><b>Create Media Pool</b></p> <p><b>Basic Tab</b></p> <ul style="list-style-type: none"> <li>• <u>Name:</u> <b>NSRBackup</b></li> <li>• <u>Groups:</u> Check the <b>NSRBackup</b> box</li> <li>• <u>Label Template:</u> <b>NSRBackup</b></li> </ul>  <p>Click <b>OK</b> to save.</p>

Step	Action																		
4	<p>From the <b>Devices</b> tab re-label the device currently in the Manual pool into your newly created NSRBackup pool.</p> <p><b>Right-click</b> your &lt;servername&gt;_aftd2 device and select <b>label</b>.</p> <div data-bbox="651 333 1170 831" data-label="Image"> <p>A screenshot of a device management interface. A list of devices is shown with 'nwwindows_aftd2' selected. A context menu is open over it, listing various actions. The 'Label...' option is highlighted by the mouse cursor.</p> </div> <p>Label the volume by selecting the following options:</p> <p><b>Label</b></p> <ul style="list-style-type: none"> <li>• <u>Pools</u>: NSRBackup</li> </ul> <div data-bbox="646 1010 1174 1451" data-label="Image"> <p>A screenshot of the 'Label' dialog box. The 'Device' field contains 'nwwindows_aftd2'. The 'Volume Label' field contains 'nsrbackup.01'. The 'Pools' dropdown menu is set to 'NSRBackup'. The 'Manual Recycle' checkbox is unchecked, and the 'Mount after Labeling' checkbox is checked. 'OK' and 'Cancel' buttons are at the bottom.</p> </div> <p>Click <b>OK</b> and then click <b>Yes</b> to confirm you want to overwrite the existing data on the volume.</p> <div data-bbox="375 1593 1448 1728" data-label="Table"> <table border="1"> <thead> <tr> <th>Name</th> <th>Parent jukebox</th> <th>Description</th> <th>Volume name</th> <th>M...</th> <th>Enabled</th> </tr> </thead> <tbody> <tr> <td>nwwindows_aftd1</td> <td></td> <td></td> <td>Disk1.001</td> <td>a...</td> <td>Yes</td> </tr> <tr> <td>nwwindows_aftd2</td> <td></td> <td></td> <td>nsrbackup.01</td> <td>a...</td> <td>Yes</td> </tr> </tbody> </table> </div> <p><b>Note:</b> Ensure that the <b>Disk1</b> pool is <b>NOT selected</b> on the properties of the <b>client</b> in the <b>NSRBackup</b> group. If it is, it will override the pool settings and send data to the Disk1 pool. The pool entry of the client should be blank.</p>	Name	Parent jukebox	Description	Volume name	M...	Enabled	nwwindows_aftd1			Disk1.001	a...	Yes	nwwindows_aftd2			nsrbackup.01	a...	Yes
Name	Parent jukebox	Description	Volume name	M...	Enabled														
nwwindows_aftd1			Disk1.001	a...	Yes														
nwwindows_aftd2			nsrbackup.01	a...	Yes														

Step	Action																																																								
5	Perform a backup of the <b>NSRBackup</b> group.																																																								
6	<p>While the backup runs, note that the save sessions are writing to the device labeled in the NSRBackup pool.</p>  <table border="1" data-bbox="332 388 1490 688"> <thead> <tr> <th colspan="7">Save Sessions</th> </tr> <tr> <th>Client Name</th> <th>Save Set</th> <th>Group / Policy</th> <th>Level</th> <th>Start Time</th> <th>Duration</th> <th>Device</th> </tr> </thead> <tbody> <tr> <td>nwwindows....</td> <td>index:nwwindows.emc.edu</td> <td>NSRBackup</td> <td>9</td> <td>10/1/13 9:56:52 AM</td> <td>00:00:24</td> <td>nwwindows_aftd2</td> </tr> <tr> <td>nwwindows....</td> <td>bootstrap</td> <td>NSRBackup</td> <td>full</td> <td>10/1/13 9:56:54 AM</td> <td>00:00:22</td> <td>nwwindows_aftd2</td> </tr> </tbody> </table> <table border="1" data-bbox="332 577 1490 688"> <thead> <tr> <th colspan="7">Devices</th> </tr> <tr> <th>Status</th> <th>Device</th> <th>Storage No...</th> <th>Library</th> <th>Volume</th> <th>Pool</th> <th>Message</th> </tr> </thead> <tbody> <tr> <td></td> <td>nwwindows_aftd1</td> <td>nwwindo...</td> <td></td> <td>Disk1_001</td> <td>Disk1</td> <td>writing, done</td> </tr> <tr> <td></td> <td>nwwindows_aftd2</td> <td>nwwindo...</td> <td></td> <td>nsrbackup.01</td> <td>NSRBackup</td> <td>writing, idle</td> </tr> </tbody> </table>	Save Sessions							Client Name	Save Set	Group / Policy	Level	Start Time	Duration	Device	nwwindows....	index:nwwindows.emc.edu	NSRBackup	9	10/1/13 9:56:52 AM	00:00:24	nwwindows_aftd2	nwwindows....	bootstrap	NSRBackup	full	10/1/13 9:56:54 AM	00:00:22	nwwindows_aftd2	Devices							Status	Device	Storage No...	Library	Volume	Pool	Message		nwwindows_aftd1	nwwindo...		Disk1_001	Disk1	writing, done		nwwindows_aftd2	nwwindo...		nsrbackup.01	NSRBackup	writing, idle
Save Sessions																																																									
Client Name	Save Set	Group / Policy	Level	Start Time	Duration	Device																																																			
nwwindows....	index:nwwindows.emc.edu	NSRBackup	9	10/1/13 9:56:52 AM	00:00:24	nwwindows_aftd2																																																			
nwwindows....	bootstrap	NSRBackup	full	10/1/13 9:56:54 AM	00:00:22	nwwindows_aftd2																																																			
Devices																																																									
Status	Device	Storage No...	Library	Volume	Pool	Message																																																			
	nwwindows_aftd1	nwwindo...		Disk1_001	Disk1	writing, done																																																			
	nwwindows_aftd2	nwwindo...		nsrbackup.01	NSRBackup	writing, idle																																																			
7	<p>To verify the save sets reside on the volume from the NSRBackup pool, from the <b>Media</b> tab, select <b>Disk Volumes</b>, and <b>double-click</b> the <b>nsrbackup.01</b> volume to validate the contents of the volume.</p>  <table border="1" data-bbox="370 850 1453 1108"> <thead> <tr> <th colspan="4">Volume Save Sets</th> </tr> <tr> <th colspan="4">Volume: nsrbackup.01</th> </tr> <tr> <th>Client</th> <th>Save Set</th> <th>SSID</th> <th>Save Time</th> </tr> </thead> <tbody> <tr> <td>nwwindows.emc.edu</td> <td>bootstrap</td> <td>3427456166</td> <td>10/1/13 9:56:55 AM</td> </tr> <tr> <td>nwwindows.emc.edu</td> <td>index:nwwindows.emc.edu</td> <td>3444233381</td> <td>10/1/13 9:56:52 AM</td> </tr> <tr> <td>nwwindows.emc.edu</td> <td>C:\Program Files\EMC NetW...</td> <td>3461010581</td> <td>10/1/13 9:56:35 AM</td> </tr> </tbody> </table> <p>Click <b>ok</b>.</p>	Volume Save Sets				Volume: nsrbackup.01				Client	Save Set	SSID	Save Time	nwwindows.emc.edu	bootstrap	3427456166	10/1/13 9:56:55 AM	nwwindows.emc.edu	index:nwwindows.emc.edu	3444233381	10/1/13 9:56:52 AM	nwwindows.emc.edu	C:\Program Files\EMC NetW...	3461010581	10/1/13 9:56:35 AM																																
Volume Save Sets																																																									
Volume: nsrbackup.01																																																									
Client	Save Set	SSID	Save Time																																																						
nwwindows.emc.edu	bootstrap	3427456166	10/1/13 9:56:55 AM																																																						
nwwindows.emc.edu	index:nwwindows.emc.edu	3444233381	10/1/13 9:56:52 AM																																																						
nwwindows.emc.edu	C:\Program Files\EMC NetW...	3461010581	10/1/13 9:56:35 AM																																																						

*End of Lab Exercise 5-1*


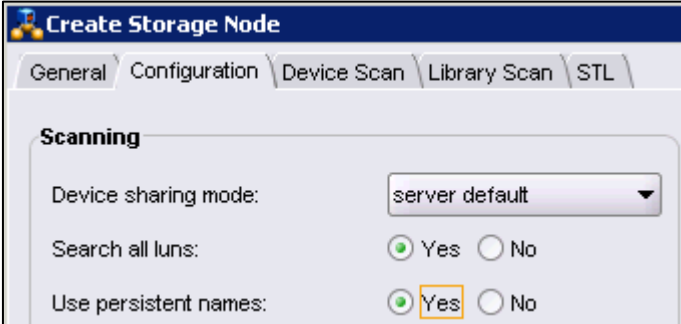
*End of Lab 5*

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## Lab 6: Working with NetWorker Devices

<b>Purpose:</b>	In this lab, you configure a storage node resource, an advanced file type device, and a dedicated autochanger controlled by the storage node.
<b>Tasks:</b>	In this lab you: <ul style="list-style-type: none"><li>• Create a NetWorker resource for the storage node</li><li>• Create a NetWorker resource for an advanced file type device.</li><li>• Label a volume in the new device and mount it.</li><li>• Perform a backup and verify that the new device is used.</li><li>• Configure and run a client direct backup.</li><li>• View volume and save set information pertaining to the advanced file type device volume.</li><li>• Use inquire to view available autochangers and their associated drive path names.</li><li>• Configure a dedicated autochanger controlled by the storage node host.</li><li>• Configure a dedicated autochanger controlled by the NetWorker server.</li><li>• Perform a backup to verify the autochanger configuration is correct.</li></ul>

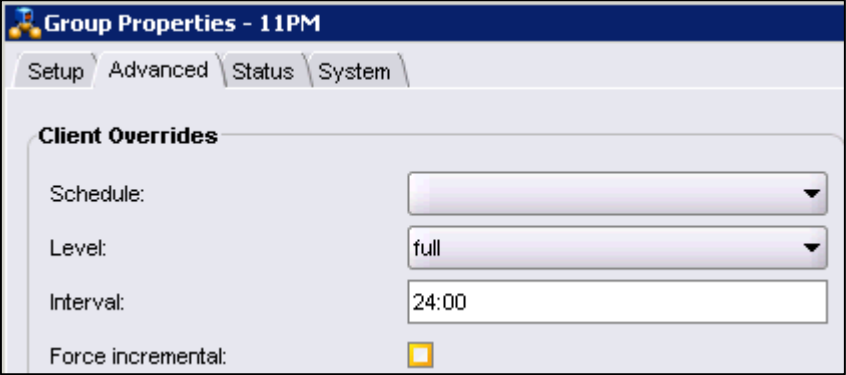
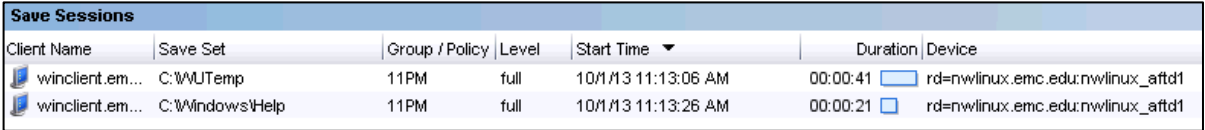
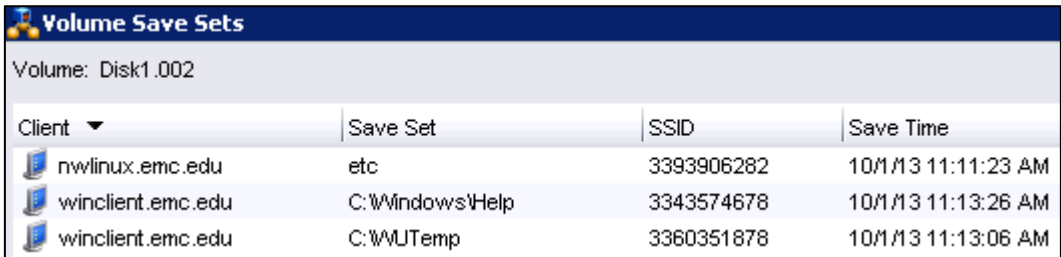
## Lab Exercise 6-1: Create a Storage Node Resource

Step	Action
1	<p>From the <b>Devices</b> tab, <b>right-click</b> the <b>Storage Nodes</b> folder and create a <b>New</b> storage node resource with the following properties:</p> <p><b>Create Storage Node</b></p> <p><b>General Tab</b></p> <ul style="list-style-type: none"><li>• <b>Name:</b> FQDN of your Storage Node <i>Note:</i> Your storage node is the VM that you loaded the client and storage node software on. If you NetWorker server is Windows, it will be the Linux server.</li></ul> <div data-bbox="589 657 1232 814"></div> <p><b>Configuration Tab</b></p> <ul style="list-style-type: none"><li>• <b>Search all luns:</b> Yes</li><li>• <b>Use persistent names:</b> Yes</li></ul> <div data-bbox="571 999 1248 1320"></div> <p>Click <b>OK</b>.</p>

*End of Lab Exercise 6-1*

## Lab Exercise 6-2: Configure an Advanced File Type Device

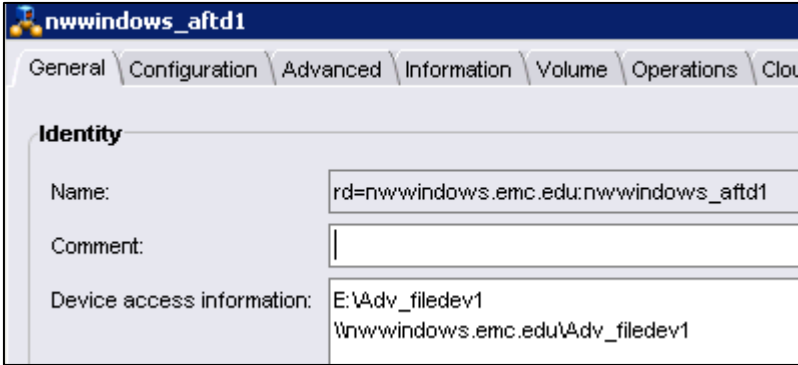

Step	Action												
1	<p>From the <b>Devices</b> tab, right-click <b>Devices</b> and use the <b>New Device Wizard</b> to create a new <b>AFTD</b> with the following properties:</p> <p><b>Device Configuration Wizard</b></p> <ul style="list-style-type: none"> <li>• <b>Device Type:</b> <b>Advanced File Type Device (AFTD)</b></li> <li>• <b>Storage Node:</b> Name of your <b>Storage Node</b></li> <li>• <b>Device Path:</b>  <div style="margin-left: 20px;"> <u>Linux Storage Node:</u> <b>/backupdev/adv_filedev1</b>  <u>Windows Storage Node:</u> <b>E:\adv_filedev1</b> </div> </li> <li>• <b>Device Name:</b> <b>&lt;storage node short name&gt;_aftd1</b></li> <li>• <b>Pool:</b> <b>Disk1</b></li> </ul> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="background-color: #e1eef6; margin: 0;"><b>Adding new AFTD "rd=nwlinux.emc.edu:nwlinux_aftd1"</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 30%;">AFTD Name:</td><td>rd=nwlinux.emc.edu:nwlinux_aftd1</td></tr> <tr><td>Device Access Information:</td><td>/backupdev/adv_filedev1</td></tr> <tr><td>Target Sessions:</td><td>4</td></tr> <tr><td>Max Sessions:</td><td>32</td></tr> </table> <p style="background-color: #e1eef6; margin: 0;"><b>Labeling device "rd=nwlinux.emc.edu:nwlinux_aftd1"</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 30%;">Device Name:</td><td>rd=nwlinux.emc.edu:nwlinux_aftd1</td></tr> <tr><td>Pool Name:</td><td>Disk1</td></tr> </table> </div> <p>Click <b>Configure</b> and <b>Finish</b> to complete configuration of the device.</p>	AFTD Name:	rd=nwlinux.emc.edu:nwlinux_aftd1	Device Access Information:	/backupdev/adv_filedev1	Target Sessions:	4	Max Sessions:	32	Device Name:	rd=nwlinux.emc.edu:nwlinux_aftd1	Pool Name:	Disk1
AFTD Name:	rd=nwlinux.emc.edu:nwlinux_aftd1												
Device Access Information:	/backupdev/adv_filedev1												
Target Sessions:	4												
Max Sessions:	32												
Device Name:	rd=nwlinux.emc.edu:nwlinux_aftd1												
Pool Name:	Disk1												
2	<p>From the <b>Configuration</b> tab, modify the <b>two clients</b> in the <b>11PM</b> group to use the newly created storage node by changing the following property:</p> <p><b>Client Properties</b></p> <p style="margin-left: 20px;"><b>Globals (2 of 2) Tab</b></p> <ul style="list-style-type: none"> <li>• <b>Storage Nodes:</b> <b>&lt;FQDN of storage node&gt;</b>  <div style="margin-left: 40px;"><b>nsrserverhost</b></div> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 2px;">Storage Nodes:</td> <td style="padding: 2px;">nwlinux.emc.edu nsrserverhost</td> </tr> </table> </div> <p>Click <b>OK</b> and repeat the process to edit the other client in the 11PM group.</p>	Storage Nodes:	nwlinux.emc.edu nsrserverhost										
Storage Nodes:	nwlinux.emc.edu nsrserverhost												

Step	Action
3	<p>From the <b>Configuration</b> tab, <b>edit</b> the properties of the <b>11PM</b> group to make the following changes:  <b>Group Properties – 11PM</b>  <b>Advanced Tab</b></p> <ul style="list-style-type: none"> <li>• <u>Level</u>: <b>Full</b></li> <li>• <u>Force Incremental</u>: <b>Un-check the box</b></li> </ul>  <p>Click <b>OK</b>.</p>
4	<p>From the <b>Monitoring</b> tab, run a backup of the <b>11PM</b> group.  Monitor the backup to verify that the storage node device is used for most of the save sets.</p>  <p><b>Note:</b> Not all save sets are sent to the storage node. Index save sets are backed up from the NetWorker server and will not be directed to this device.</p>
5	<p>From the <b>Media</b> tab, select <b>Disk Volumes</b>, and double-click the <b>Disk1.002</b> volume to validate the save sets from the backup reside on the volume.</p> 

*End of Lab Exercise 6-2*

## Lab Exercise 6-3: Configure and Run a Client Direct Backup

In order to facilitate client direct backups a CIFS share has already been created on your Windows server for the E:\Adv\_filedev1 device. This has been preconfigured to save time in the labs, however this would be required if performing this outside of the lab.

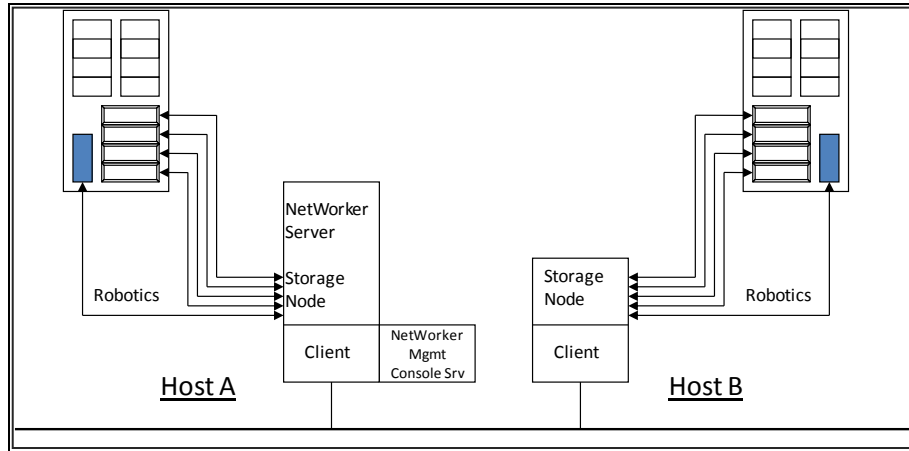
Step	Action
1	<p>From the <b>Devices</b> tab, edit the <b>properties</b> of your <b>nwwindows_aftd1</b> device and make the following additions:</p> <p><b>Device Properties – nwwindows_aftd1</b></p> <p><b>General Tab</b></p> <ul style="list-style-type: none"><li>• <u>Device Access Information:</u> \\nwwindows.emc.edu\Adv_filedev1</li></ul>  <p><b>Configuration Tab</b></p> <ul style="list-style-type: none"><li>• <u>Remote User:</u> administrator</li><li>• <u>Password:</u> student</li></ul>  <p>Click <b>OK</b>.</p>

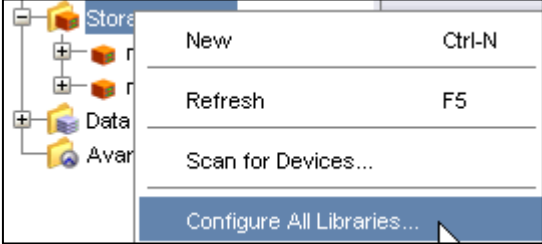
Step	Action																		
2	<p>From the <b>Configuration</b> tab, <b>validate</b> the client <b>winclient.emc.edu</b> will use <b>nwwindows.emc.edu</b> as its <b>storage node</b>:</p> <p><b>Client Properties – winclient.emc.edu</b>  <b>Globals (2 of 2) Tab</b></p> <ul style="list-style-type: none"> <li><b>Storage Nodes:</b> <b>nwwindows.emc.edu</b> (If Linux NetWorker server)  <b>nsrserverhost</b> (If Windows NetWorker server)</li> </ul> <div data-bbox="688 445 1162 520" style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;">       Storage Nodes:      nsrserverhost     </div> <p>Click <b>OK</b>.</p> <p><u>Note:</u> If you chose to use a Linux NetWorker server, then the <b>storage node attribute</b> for <b>winclient.emc.edu</b>, should contain <b>nwwindows.emc.edu</b>. If instead you are using a Windows NetWorker server, the storage node attribute should contain only the keyword <b>nsrserverhost</b>.</p>																		
3	<p>From the <b>Monitoring</b> tab, run a backup of the 11PM group.</p> <p>When the backup has completed, open the <b>Details</b> window for the 11PM group and <b>double-click</b> the <b>C:\WUTemp</b> save set.</p> <div data-bbox="599 963 1252 1257" style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p>Completed Successfully:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Client Name</th> <th>Save Set</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>nwlinux.emc...</td> <td>nwlinux.emc.edu:index</td> <td>full</td> </tr> <tr> <td>nwlinux.emc...</td> <td>etc</td> <td>full</td> </tr> <tr> <td>winclient.em...</td> <td>winclient.emc.edu:index</td> <td>full</td> </tr> <tr> <td>winclient.em...</td> <td>C:\Windows\Help</td> <td>full</td> </tr> <tr style="background-color: #e0e0e0;"> <td>winclient.em...</td> <td>C:\WUTemp</td> <td>full</td> </tr> </tbody> </table> </div> <p>In the pop-up windows that is displayed note the message stating <i>Successfully established DFA session with adv_file device</i>. This indicates that a Client Direct backup has been performed.</p> <div data-bbox="417 1400 1433 1593" style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p><b>Show Messages</b></p> <p>Below are the messages for the saveset.</p> <pre>86705:save: Successfully established DFA session with adv_file device for save-set ID '3192590007' (winclient.emc.edu:C:\WUTemp).</pre> </div> <p>Click <b>OK</b> twice to close both windows.</p> <p><u>Note:</u> If you do not see the DFA message, validate the pathname to the share is typed exactly as written in the lab guide and that you correctly entered the username and password.</p>	Client Name	Save Set	Level	nwlinux.emc...	nwlinux.emc.edu:index	full	nwlinux.emc...	etc	full	winclient.em...	winclient.emc.edu:index	full	winclient.em...	C:\Windows\Help	full	winclient.em...	C:\WUTemp	full
Client Name	Save Set	Level																	
nwlinux.emc...	nwlinux.emc.edu:index	full																	
nwlinux.emc...	etc	full																	
winclient.em...	winclient.emc.edu:index	full																	
winclient.em...	C:\Windows\Help	full																	
winclient.em...	C:\WUTemp	full																	

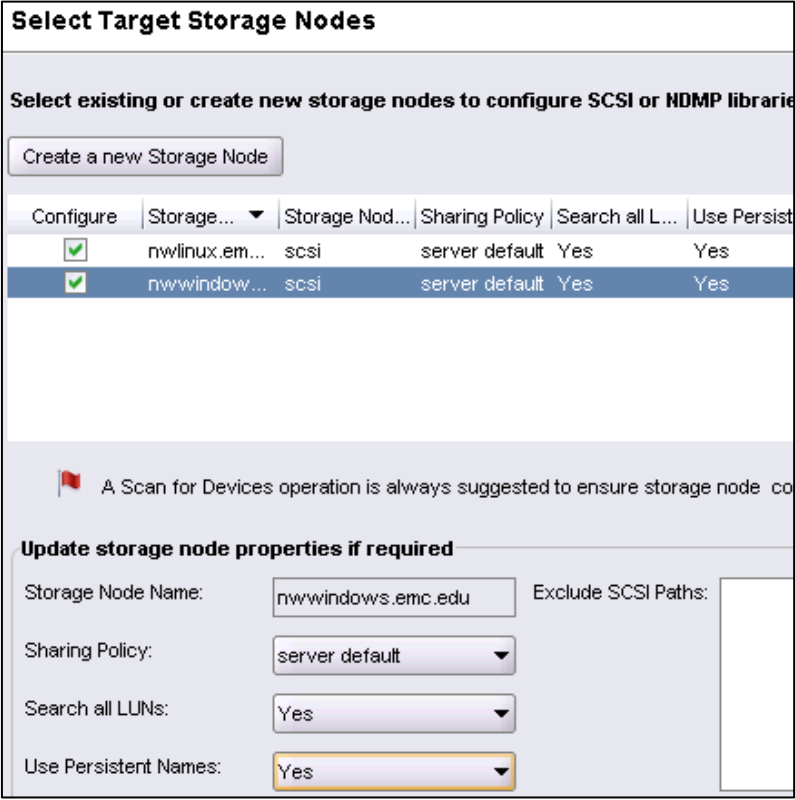
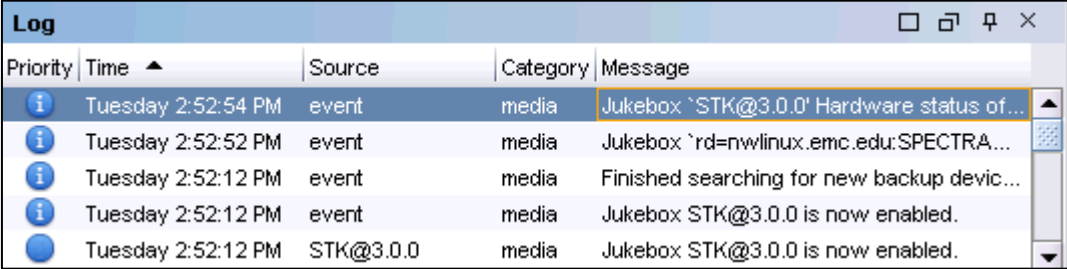
*End of Lab Exercise 6-3*

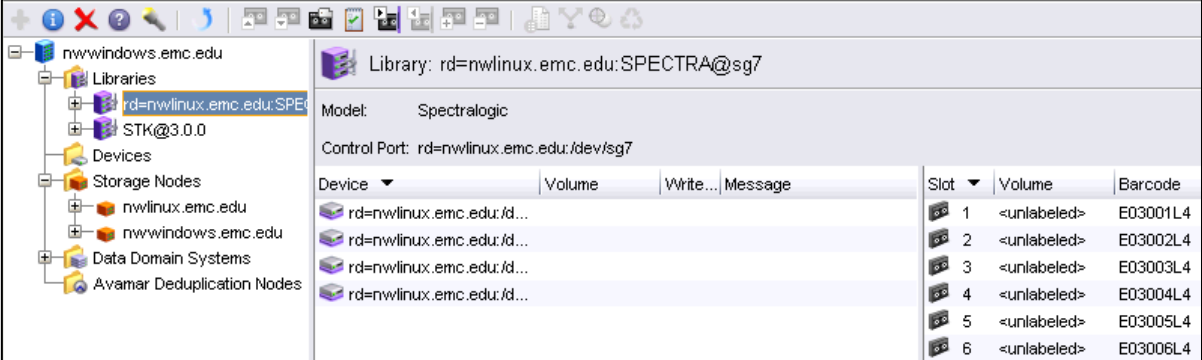
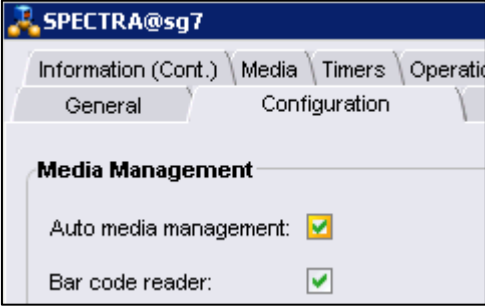
## Lab Exercise 6-4: Configure Library Resources



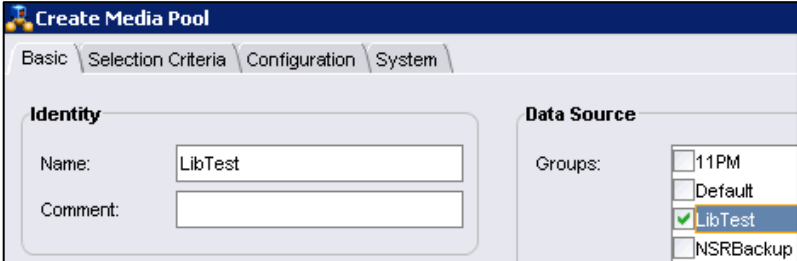
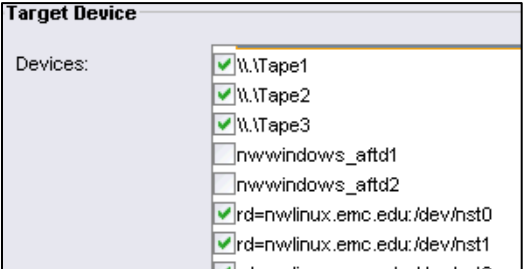
In this lab, you configure two dedicated tape libraries, one controlled by the storage node host and the other by the NetWorker server.

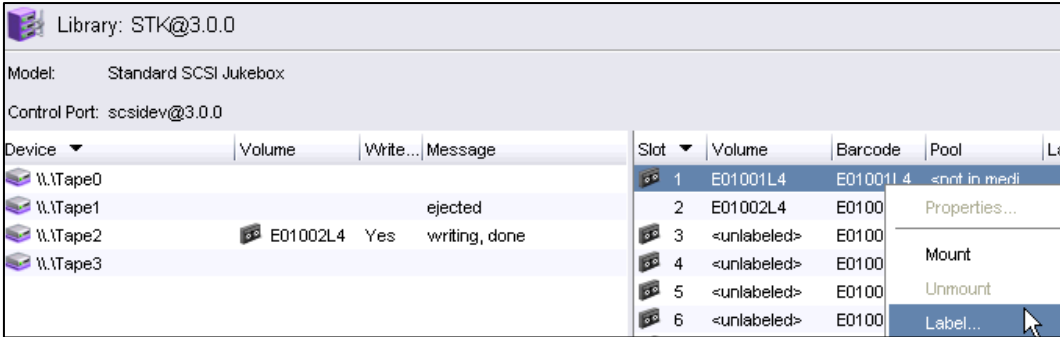
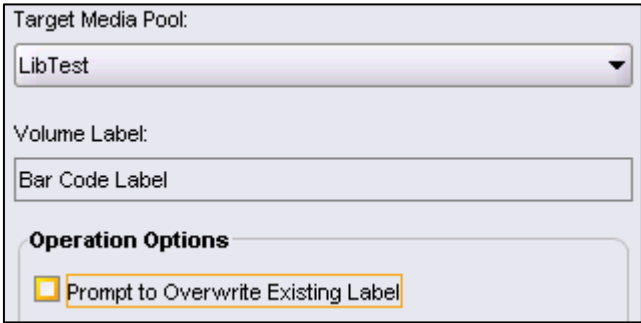





Step	Action
1	<p>From a <b>command prompt</b> on the <b>NetWorker server</b> and <b>storage node</b>, type the command <b>inquire</b>.</p> <p>Validate that an <b>autochanger</b> and <b>four tape drives</b> are detected.</p> <pre data-bbox="394 338 1471 888"> C:\&gt;inquire scsidev@2.0.0:UMware   Virtual disk   1.0  Disk, \\.\PhysicalDrive0 scsidev@2.1.0:UMware   Virtual disk   1.0  Disk, \\.\PhysicalDrive1 scsidev@3.0.0:STK      L700          550U  Autochanger (Jukebox),                         S/N: XYZZY_A                         ATNN=STK      L700          XYZZY_A                         WWNN=50223344AB000000 scsidev@3.1.0:IBM      ULT3580-TD4   550U  Tape, \\.\Tape1                         S/N: XYZZY_A1                         ATNN=IBM      ULT3580-TD4   XYZZY_A1                         WWNN=50223344AB000100 scsidev@3.2.0:IBM      ULT3580-TD4   550U  Tape, \\.\Tape2                         S/N: XYZZY_A2                         ATNN=IBM      ULT3580-TD4   XYZZY_A2                         WWNN=50223344AB000200                         encryption unsupported scsidev@3.3.0:IBM      ULT3580-TD4   550U  Tape, \\.\Tape3                         S/N: XYZZY_A3                         ATNN=IBM      ULT3580-TD4   XYZZY_A3                         WWNN=50223344AB000300                         encryption unsupported scsidev@3.4.0:IBM      ULT3580-TD4   550U  Tape, \\.\Tape0                         S/N: XYZZY_A4                         ATNN=IBM      ULT3580-TD4   XYZZY_A4                         WWNN=50223344AB000400                         encryption unsupported </pre> <p><u>Note:</u> if an autochanger and four tape drives are not detected, power off and power on the VM VTL in you lab manager configuration.</p>
2	<p>From the <b>Devices</b> tab in the Administration interface, right-click the <b>Storage Nodes</b> in the left pane and select <b>Configure all libraries</b>.</p> 
3	<p>In the <b>Provide General Configuration Information</b> window, leave all selections at their default values.</p> <p>Click <b>Next</b>.</p>

Step	Action
4	<p>In the <b>Select Target Storage Nodes</b> window, make the following selections for both storage nodes:  <b>Configure All Libraries</b>  <b>Select Target Storage Nodes</b></p> <ul style="list-style-type: none"> <li>• <u>Configure</u>: Select the check box for both storage nodes</li> <li>• <u>Search all LUNs</u>: Yes</li> <li>• <u>Use Persistent Names</u>: Yes</li> </ul>  <p>Click <b>Start Configuration</b> and <b>Finish</b>.</p>
5	<p>Monitor the <b>Log</b> window in the lower left corner of the NetWorker Administration GUI until the message is displayed that <b>both jukeboxes</b> have been <b>enabled</b> and are <b>ready</b>.</p> 

Step	Action																																																	
6	<p>From the <b>Devices</b> tab, expand the + symbol next to <b>Libraries</b> to view the two libraries you just configured.</p> <p><b>Click</b> each of the two <b>libraries</b> to see the <b>configuration</b> and <b>inventory</b> of each library.</p>  <table border="1" data-bbox="649 541 1533 730"> <thead> <tr> <th>Device</th> <th>Volume</th> <th>Write...</th> <th>Message</th> <th>Slot</th> <th>Volume</th> <th>Barcode</th> </tr> </thead> <tbody> <tr> <td>rd=nwlinux.emc.edu:/d...</td> <td>&lt;unlabeled&gt;</td> <td></td> <td></td> <td>1</td> <td>&lt;unlabeled&gt;</td> <td>E03001L4</td> </tr> <tr> <td>rd=nwlinux.emc.edu:/d...</td> <td>&lt;unlabeled&gt;</td> <td></td> <td></td> <td>2</td> <td>&lt;unlabeled&gt;</td> <td>E03002L4</td> </tr> <tr> <td>rd=nwlinux.emc.edu:/d...</td> <td>&lt;unlabeled&gt;</td> <td></td> <td></td> <td>3</td> <td>&lt;unlabeled&gt;</td> <td>E03003L4</td> </tr> <tr> <td>rd=nwlinux.emc.edu:/d...</td> <td>&lt;unlabeled&gt;</td> <td></td> <td></td> <td>4</td> <td>&lt;unlabeled&gt;</td> <td>E03004L4</td> </tr> <tr> <td>rd=nwlinux.emc.edu:/d...</td> <td>&lt;unlabeled&gt;</td> <td></td> <td></td> <td>5</td> <td>&lt;unlabeled&gt;</td> <td>E03005L4</td> </tr> <tr> <td>rd=nwlinux.emc.edu:/d...</td> <td>&lt;unlabeled&gt;</td> <td></td> <td></td> <td>6</td> <td>&lt;unlabeled&gt;</td> <td>E03006L4</td> </tr> </tbody> </table>	Device	Volume	Write...	Message	Slot	Volume	Barcode	rd=nwlinux.emc.edu:/d...	<unlabeled>			1	<unlabeled>	E03001L4	rd=nwlinux.emc.edu:/d...	<unlabeled>			2	<unlabeled>	E03002L4	rd=nwlinux.emc.edu:/d...	<unlabeled>			3	<unlabeled>	E03003L4	rd=nwlinux.emc.edu:/d...	<unlabeled>			4	<unlabeled>	E03004L4	rd=nwlinux.emc.edu:/d...	<unlabeled>			5	<unlabeled>	E03005L4	rd=nwlinux.emc.edu:/d...	<unlabeled>			6	<unlabeled>	E03006L4
Device	Volume	Write...	Message	Slot	Volume	Barcode																																												
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rd=nwlinux.emc.edu:/d...	<unlabeled>			6	<unlabeled>	E03006L4																																												
7	<p>Right-click each library resource and edit the properties to make the following change:</p> <p><b>Library Properties</b></p> <p><b>Configuration Tab</b></p> <ul style="list-style-type: none"> <li>• <u>Auto media management</u>: <b>Check the box</b></li> </ul>  <p>Click <b>OK</b> and <b>perform</b> the <b>same operation</b> on the <b>second library</b>.</p>																																																	
8	<p>From the <b>Configuration</b> tab, <b>right-click</b> groups and create a new group with the following options:</p> <p><b>Create Group</b></p> <p><b>Setup Tab</b></p> <ul style="list-style-type: none"> <li>• <u>Name</u>: <b>LibTest</b></li> </ul> <p><b>Advanced Tab</b></p> <ul style="list-style-type: none"> <li>• <u>Level</u>: <b>full</b></li> <li>• <u>Force incremental</u>: <b>Unchecked</b></li> </ul> <p>Click <b>OK</b>.</p>																																																	

Step	Action
9	<p>From the <b>Configuration</b> tab modify the <b>client</b> instance for your <b>storage node</b> to make the following changes:</p> <p><b>Client Properties - &lt;Storage Node Client&gt;</b></p> <p><b>General Tab</b></p> <ul style="list-style-type: none"> <li><b>Group:</b> Ensure only the LibTest group is selected</li> </ul>  <ul style="list-style-type: none"> <li><b>Pool:</b> Clear any selection so that a blank field is displayed</li> </ul>  <p>Click <b>OK</b>.</p>
10	<p>From the <b>Media</b> tab, right-click <b>Media Pools</b> and create a <b>New</b> media pool with the following options:</p> <p><b>Create Media Pool</b></p> <p><b>Basic Tab</b></p> <ul style="list-style-type: none"> <li><b>Name:</b> LibTest</li> <li><b>Groups:</b> LibTest</li> </ul>  <p><b>Selection Criteria Tab</b></p> <ul style="list-style-type: none"> <li><b>Target Devices:</b> Select all tape devices (Names include Tape or NST)</li> </ul>  <p>Click <b>OK</b>, click <b>OK</b> to acknowledge all pop-ups, and finally click <b>OK</b> again to allow NetWorker to automatically create a label for this pool.</p>

Step	Action
11	<p>From the <b>Configuration</b> tab, edit the <b>properties</b> of the client resource for your <b>storage node</b> and validate that the following property is configured:</p> <p><b>Client Properties - &lt;storage node client&gt;</b>  <b>Globals (2 of 2)</b></p> <ul style="list-style-type: none"> <li>• <u>Storage Nodes:</u> &lt;FQDN of Storage Node&gt;</li> </ul> <p>Click <b>OK</b>.</p>
12	<p>From the <b>Devices</b> tab, <b>select</b> one of the <b>tape libraries</b> you have configured. <b>Right-click</b> one of the <b>tape volumes</b> and select <b>Label</b>.</p>  <p>Label the tape with the following options:</p> <p><b>Label Library Media</b></p> <ul style="list-style-type: none"> <li>• <u>Target Media Pool:</u> <b>LibTest</b></li> <li>• <u>Prompt to Overwrite Existing Label:</u> <b>Uncheck the box</b></li> </ul>  <p>Click <b>OK</b>.</p>

Step	Action														
13	<p>From the <b>Monitoring</b> tab start a backup of the <b>LibTest</b> group and validate that data is sent to the newly configured tape devices.</p> <div data-bbox="349 300 1515 415" style="border: 1px solid black; padding: 5px;"> <p><b>Save Sessions</b></p> <table border="1"> <thead> <tr> <th>Client Name</th> <th>Save Set</th> <th>Group / Policy</th> <th>Level</th> <th>Start Time ▼</th> <th>Duration</th> <th>Device</th> </tr> </thead> <tbody> <tr> <td> nwlunix.emc....</td> <td>etc</td> <td>LibTest</td> <td>full</td> <td>10/11/13 4:31:01 PM</td> <td>00:02:30</td> <td><input type="checkbox"/> rd=nwlunix.emc.edu:/dev/nst3</td> </tr> </tbody> </table> </div> <p><u>Note:</u> You may receive an error stating that one or more of the tapes already contains a valid NetWorker label. These errors can be disregarded and the volumes associated with them can be relabeled without issue. This merely indicates that NetWorker has identified that these tapes were used in a NetWorker environment previously and by default does not automatically re-label them in case you need the data on them.</p>	Client Name	Save Set	Group / Policy	Level	Start Time ▼	Duration	Device	 nwlunix.emc....	etc	LibTest	full	10/11/13 4:31:01 PM	00:02:30	<input type="checkbox"/> rd=nwlunix.emc.edu:/dev/nst3
Client Name	Save Set	Group / Policy	Level	Start Time ▼	Duration	Device									
 nwlunix.emc....	etc	LibTest	full	10/11/13 4:31:01 PM	00:02:30	<input type="checkbox"/> rd=nwlunix.emc.edu:/dev/nst3									

*End of Lab Exercise 6-4*

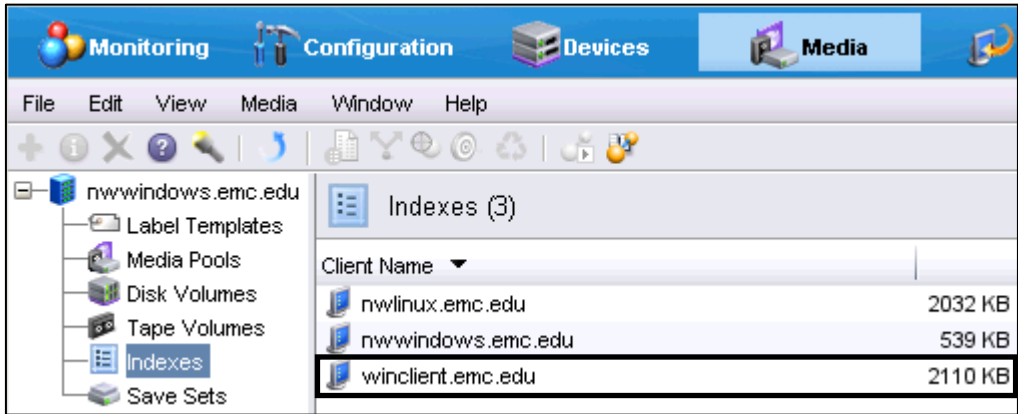
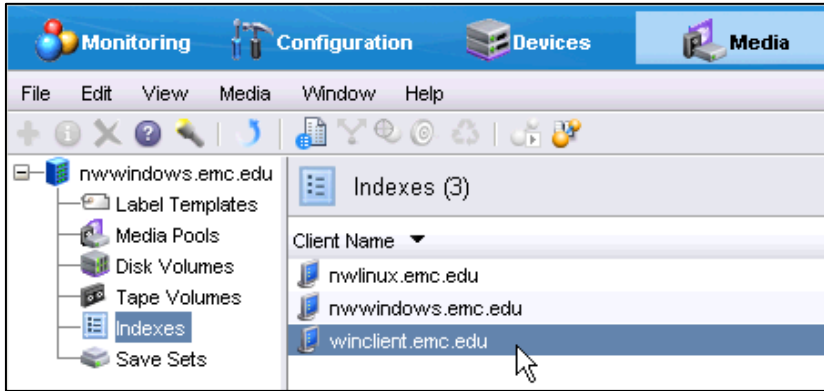
*End of Lab 6*

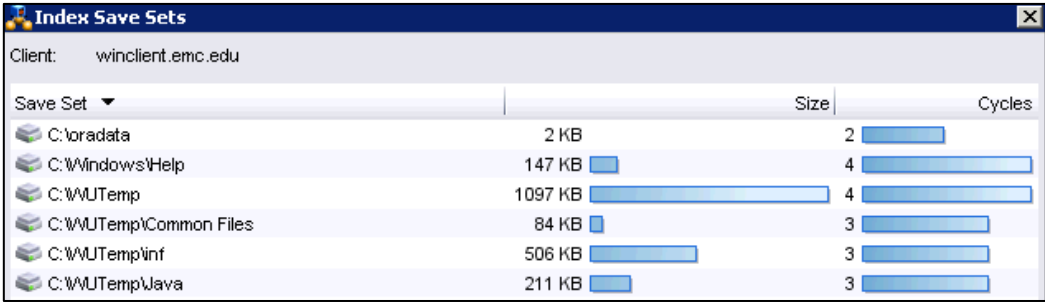
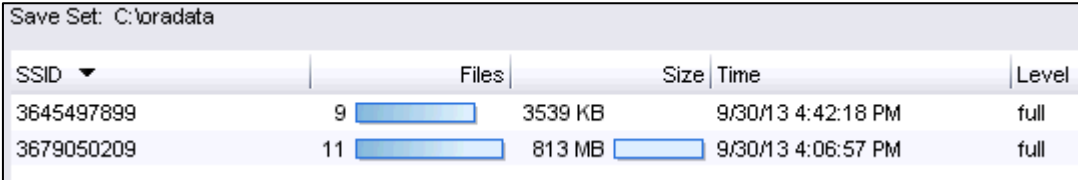
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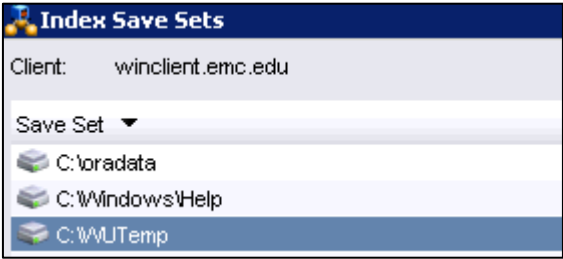
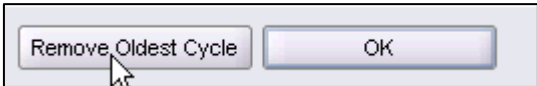
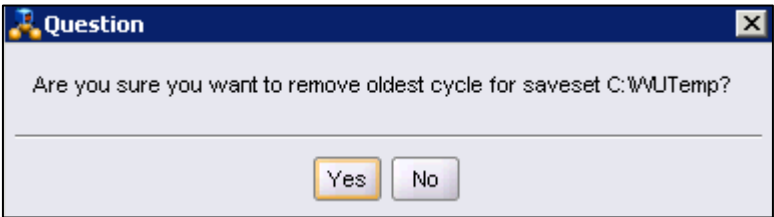
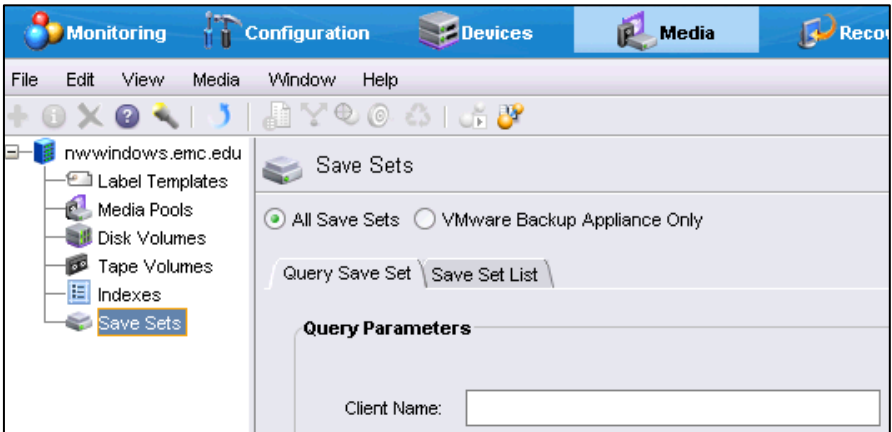
## Lab 7: Manage the Media Database and Client File Indexes

<b>Purpose:</b>	In this lab, you will use the NetWorker Administration GUI to display the contents of volumes, review client file indexes, and search for save sets.
<b>Tasks:</b>	In this lab you: <ul style="list-style-type: none"><li>• View the size of client file indexes.</li><li>• Determine the number of files in most recent backup.</li><li>• Determine size of most backups of a single client</li><li>• Use the save set query tool</li></ul>

## Lab Exercise 7-1: NetWorker Databases – Part 1

Step	Action
1	<p>From the <b>Media</b> tab select <b>Indexes</b> on the left and determine the <b>total size</b> of the client file index (CFI) for the <b>winclient.emc.edu</b> server.</p> <div style="text-align: center;">  </div> <p>Size of CFI for winclient.emc.edu: _____</p>
2	<p>Display a list of all save sets for <b>winclient.emc.edu</b> by <b>double-clicking</b> on the <b>winclient.emc.edu</b> entry in the <b>Indexes</b> box on the right side of the <b>Media</b> tab.</p> <div style="text-align: center;">  </div> <p>Keep the window open and proceed to Step 3.</p>

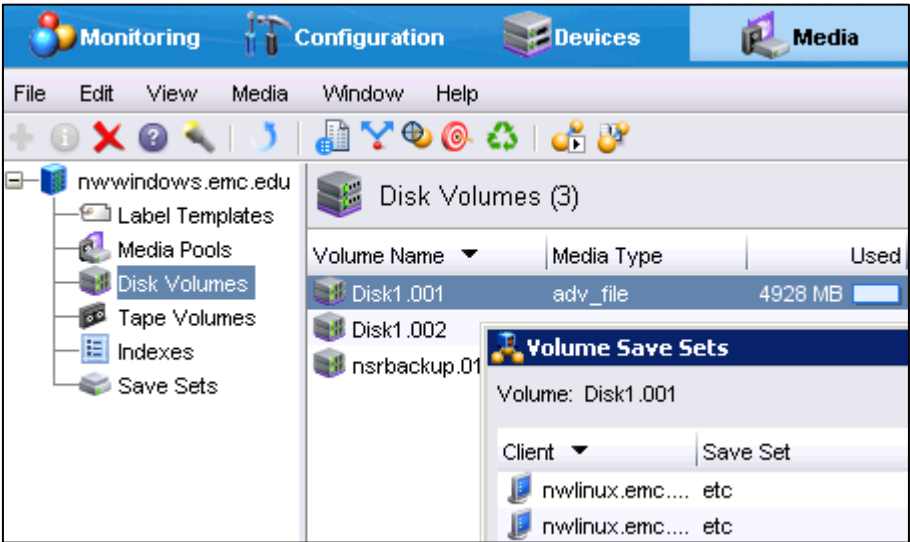
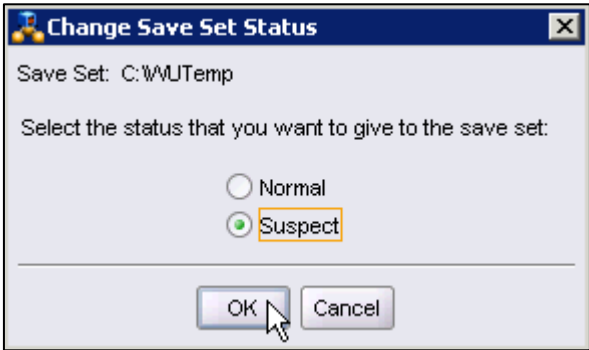
Step	Action
3	<p>Identify the save set that has been backed up the least often. (Hint: Cycle = Backup)</p>  <p>Name of least frequently backed up save set(s): _____</p>
4	<p>Click the save set that was identified in the previous step.</p>  <p>Identify the number of files and size of each backup.</p>

Step	Action
5	<p>In the <b>Index Save Sets</b> window that you already have open, select the <b>C:\WUTemp</b> save set for <b>winclient.emc.edu</b>.</p>  <p>Remove the oldest backup of this save set by clicking the <b>Remove Oldest Cycle</b> button.</p>  <p>Click <b>Yes</b> to confirm you are sure you want to remove the oldest cycle for the save set <b>C:\WUTemp</b>.</p>  <p>Note the number of SSID's now listed for the C:\WUTemp Save Set.</p> <p>Click <b>OK</b>.</p>
6	<p>From the <b>Media</b> tab click <b>Save Sets</b> from the tree on the left side. This opens the <b>Query Save Set</b> window on the right side.</p> 

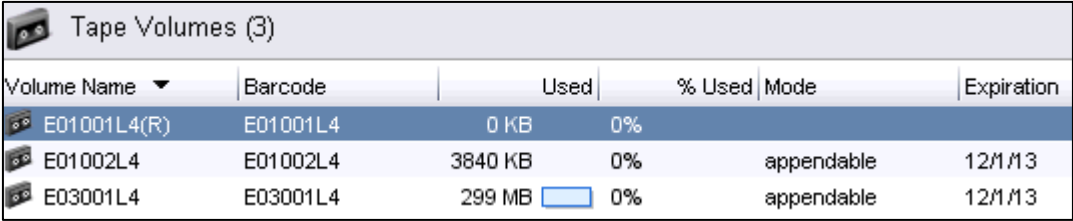
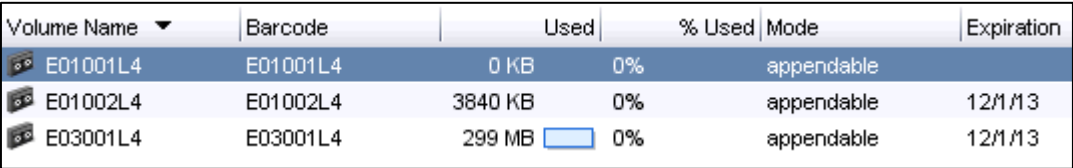
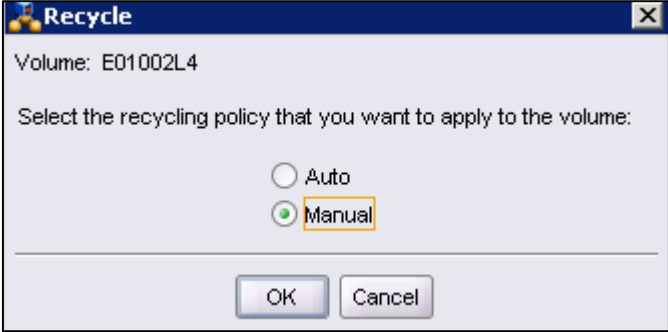
Step	Action																																																																																				
7	<p>Using the <b>Query Save Set</b> tool, generate a list of all save sets in the <b>Disk1</b> pool since the start of class by entering the following options:</p> <p><b>Query Parameters</b></p> <ul style="list-style-type: none"> <li>• <u>Pool</u>: <b>Disk1</b></li> <li>• <u>Save Time From</u>: <b>Select the first day of class</b></li> <li>• <u>Save Time To</u>: <b>Select tomorrow</b></li> </ul> <div data-bbox="581 445 1268 779" style="border: 1px solid gray; padding: 5px; margin: 10px 0;"> <p>Pool: <input type="text" value="Disk1"/></p> <p>Checkpoint ID: <input type="text"/></p> <p>Copies: <input type="text" value="&gt;"/> <input type="text" value="0"/></p> <p>Save Time:</p> <p>From <input type="text" value="Sep 30, 2013 12:00:00"/> To <input type="text" value="Oct 3, 2013 11:59:59 F"/></p> </div> <p>Leave all other fields <b>blank</b>, and select <b>Save Set List</b> to run the query and see the results.</p> <div data-bbox="423 886 1425 1415" style="border: 1px solid gray; padding: 5px; margin: 10px 0;"> <p>Query Save Set <b>Save Set List</b></p> <table border="1"> <thead> <tr> <th>Client</th> <th>Save Set</th> <th>SSID</th> <th>Clone ID</th> <th>Level</th> <th>Status</th> <th>Type</th> </tr> </thead> <tbody> <tr><td>nwlinux.emc.edu</td><td>etc</td><td>3897130489</td><td>1380548024</td><td>full</td><td>brows...</td><td></td></tr> <tr><td>nwlinux.emc.edu</td><td>etc</td><td>3611966131</td><td>1380596331</td><td>incr</td><td>brows...</td><td></td></tr> <tr><td>nwlinux.emc.edu</td><td>etc</td><td>3393906282</td><td>1380640283</td><td>full</td><td>brows...</td><td></td></tr> <tr><td>nwlinux.emc.edu</td><td>etc</td><td>3310030171</td><td>1380650250</td><td>full</td><td>brows...</td><td></td></tr> <tr><td>nwlinux.emc.edu</td><td>etc</td><td>3226144413</td><td>1380650572</td><td>full</td><td>brows...</td><td></td></tr> <tr><td>nwwindows.emc...</td><td>index:nwlinu...</td><td>3880353293</td><td>1380548109</td><td>full</td><td>recove...</td><td></td></tr> <tr><td>nwwindows.emc...</td><td>index:wincle...</td><td>3830021709</td><td>1380548173</td><td>9</td><td>recove...</td><td></td></tr> <tr><td>nwwindows.emc...</td><td>C:\Program Fi...</td><td>3813244611</td><td>1380548291</td><td>full</td><td>brows...</td><td></td></tr> <tr><td>nwwindows.emc...</td><td>index:nwwin...</td><td>3796467452</td><td>1380548348</td><td>full</td><td>recove...</td><td></td></tr> <tr><td>nwwindows.emc...</td><td>bootstrap</td><td>3779690238</td><td>1380548350</td><td>full</td><td>recove...</td><td></td></tr> <tr><td>nwwindows.emc...</td><td>index:wincle...</td><td>3662273033</td><td>1380571657</td><td>full</td><td>recove...</td><td></td></tr> </tbody> </table> </div> <p><b>Verify that only save sets in the Disk1 pool are reported by looking at the Pool heading.</b></p>	Client	Save Set	SSID	Clone ID	Level	Status	Type	nwlinux.emc.edu	etc	3897130489	1380548024	full	brows...		nwlinux.emc.edu	etc	3611966131	1380596331	incr	brows...		nwlinux.emc.edu	etc	3393906282	1380640283	full	brows...		nwlinux.emc.edu	etc	3310030171	1380650250	full	brows...		nwlinux.emc.edu	etc	3226144413	1380650572	full	brows...		nwwindows.emc...	index:nwlinu...	3880353293	1380548109	full	recove...		nwwindows.emc...	index:wincle...	3830021709	1380548173	9	recove...		nwwindows.emc...	C:\Program Fi...	3813244611	1380548291	full	brows...		nwwindows.emc...	index:nwwin...	3796467452	1380548348	full	recove...		nwwindows.emc...	bootstrap	3779690238	1380548350	full	recove...		nwwindows.emc...	index:wincle...	3662273033	1380571657	full	recove...	
Client	Save Set	SSID	Clone ID	Level	Status	Type																																																																															
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nwlinux.emc.edu	etc	3393906282	1380640283	full	brows...																																																																																
nwlinux.emc.edu	etc	3310030171	1380650250	full	brows...																																																																																
nwlinux.emc.edu	etc	3226144413	1380650572	full	brows...																																																																																
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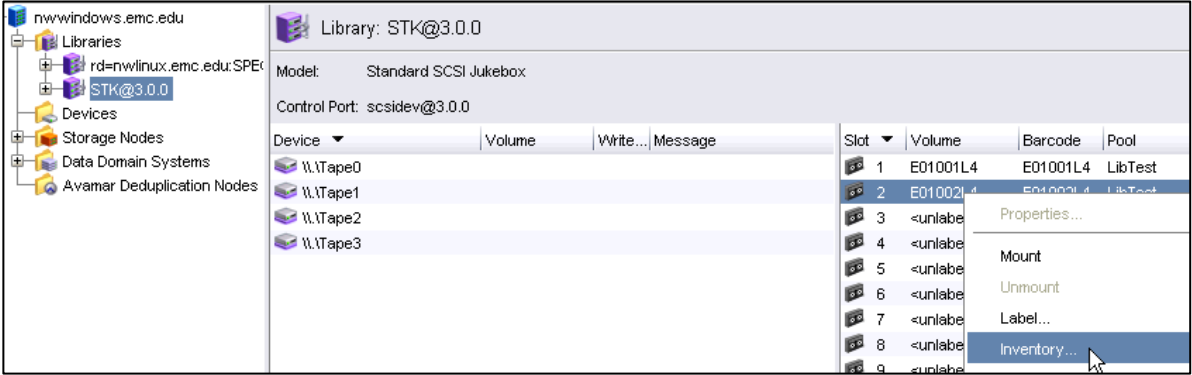
*End of Lab Exercise 7-1*

## Lab Exercise 7-2: NetWorker Databases – Part 2

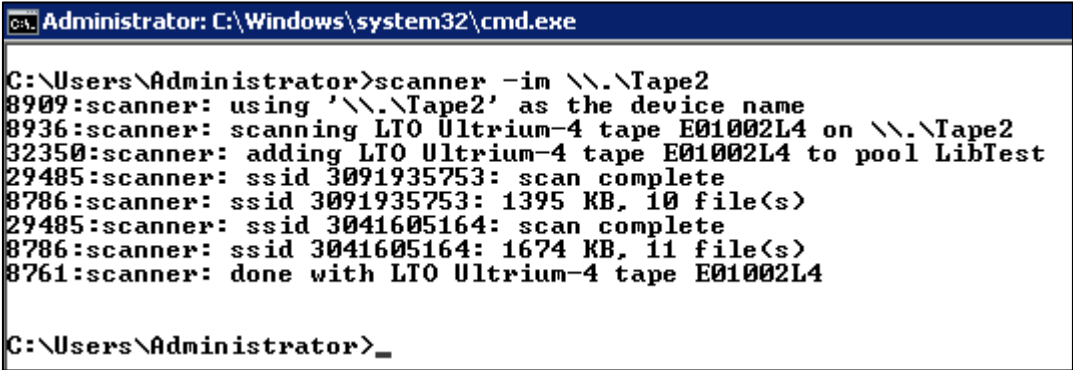
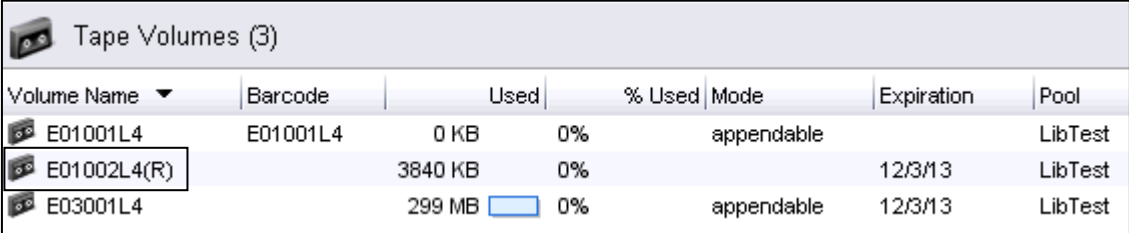
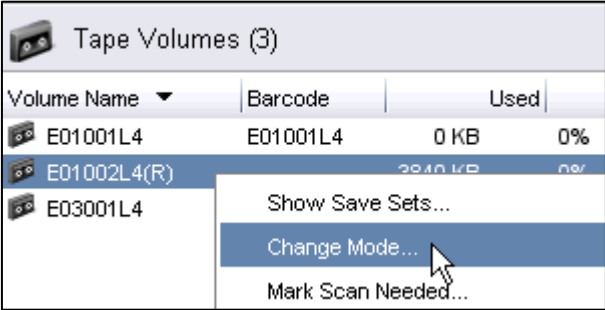
Step	Action
1	<p>From the <b>Media</b> tab select <b>Disk Volumes</b> on the left and <b>double-click</b> the <b>Disk1.001</b> volume to display the save sets on that volume.</p>  <p>Click on one of the <b>C:\WUTemp</b> save sets and note the <b>SSID</b>.</p> <p>SSID: _____</p>
2	<p>With the SSID identified in the previous step selected, <b>click</b> the <b>change status</b> button to bring up the <b>Change Save Set Status</b> pop-up and make the following change:</p> <p><b>Change Save Set Status</b></p> <ul style="list-style-type: none"> <li>• <u>Status</u>: <b>Suspect</b></li> </ul>  <p>Click <b>OK</b>.</p>

Step	Action
3	<p>In the <b>Volume Save Sets</b> window, select the previously identified <b>save set</b> and change the status back to <b>normal</b>.</p> <div data-bbox="631 296 1214 640" data-label="Image"> </div> <p>Click <b>OK</b>.</p>
4	<p>From the <b>Media</b> tab, select <b>Tape Volumes</b> to display a list of currently labeled tapes.</p> <div data-bbox="545 835 1300 1087" data-label="Image"> </div> <p>Set the mode of any of the volumes to <b>read-only</b> by <b>right-clicking</b> on one of the volumes and selecting <b>Change Mode</b>.</p> <p>In the change mode dialog box enter the following options:</p> <p><b>Change Mode</b></p> <ul style="list-style-type: none"> <li>• <u>Select Mode:</u> <b>Read Only</b></li> </ul> <div data-bbox="638 1373 1208 1755" data-label="Image"> </div> <p>Click <b>OK</b>.</p>

Step	Action
5	<p>Look at the volume you just changed in the <b>Tape Volumes</b> window.</p>  <p>What changes do you see in the <b>Name</b> and <b>Mode</b> of the volume?</p>
6	<p><b>Change</b> the <b>mode</b> of the volume back to <b>Appendable</b> and again note the changes in the <b>Name</b> and <b>Mode</b> of the volume.</p>
7	<p>From the <b>Media</b> tab, select <b>Tape Volumes</b> and select a volume from the <b>Tape Volumes</b> window that has an <b>expiration</b> date and data written to it.</p>  <p><b>Right-click</b> the selected volume and click <b>Recycle</b> to bring up the <b>Recycled Dialog Box</b> and make the following change:</p> <p><b>Recycle</b></p> <ul style="list-style-type: none"> <li>Select Recycling Policy: <b>Manual</b></li> </ul>  <p>Click <b>OK</b>, and note the change in the <b>Expiration</b> field of the volume you just modified.</p>
8	<p>Change the <b>Recycle Policy</b> of the volume back to <b>Auto</b>.</p>

Step	Action
9	<p>From the <b>Media</b> tab, select <b>tape volumes</b> on the left, and <b>right-click</b> an individual <b>volume</b> of your choice. Select the <b>Set Location</b> option and enter the following information:</p> <p><b>Set Location</b></p> <ul style="list-style-type: none"> <li>• <u>Volume:</u> Offsite</li> </ul>  <p>Click <b>OK</b> and note the <b>Location</b> field for the volume in the <b>Tape Volumes</b> window.\</p> <p>Enter the Volume Name you modified: _____</p>
10	<p>From the <b>Devices</b> tab, select the <b>tape library</b> that contains the volume you modified in the previous step. <b>Inventory</b> the <b>volume</b> in the library by <b>right-clicking</b> on it in the <b>Library window</b> and selecting <b>Inventory</b></p>  <p>Enter the following options to inventory the tape:</p> <p><b>Inventory Library</b></p> <ul style="list-style-type: none"> <li>• <u>Slot Range:</u> Ensure your volume is selected</li> <li>• <u>Check Box:</u> Force load and verify labels</li> </ul> <p>Click <b>OK</b> and monitor the operation in the library status window.</p>
11	<p>Return to the <b>Media</b> tab, select <b>Tape Volumes</b> and validate that the location of the tape has been changed automatically from offsite to the name of the tape library.</p>

Step	Action
12	<p>From the <b>Media</b> tab select a tape volume that is located in the tape library attached to the NetWorker server.  <u>Note:</u> Location should NOT have “rd=” in the name.</p> <p><b>Right-click</b> the volume selected and delete it. Enter the following information in the dialog box:</p> <p><b>Delete</b></p> <ul style="list-style-type: none"> <li>• <u>Selection:</u> <b>File and Media Index Entries</b></li> </ul> <div data-bbox="656 478 1193 814" data-label="Image"> </div> <p>Click <b>OK</b>, then click <b>OK</b> again to confirm you want to delete the volume from the database.</p> <p>Notice the volume has been removed from the list of volumes, and is displayed in the library as &lt;not in media index&gt;.</p>
13	<p>From the <b>Devices</b> tab, <b>select</b> the <b>Local Library</b> and <b>right-click</b> the <b>tape volume</b> you just deleted. Select <b>Load Without Mount</b> from the pop-up menu.</p> <div data-bbox="708 1155 1140 1474" data-label="Image"> </div> <p>Monitor the load operation and write down the name of the device that the tape was loaded into.</p> <p>Device Name: _____</p>

Step	Action																												
14	<p>Open a command prompt on your <b>NetWorker server</b> and run the following command to scan the volume you recently deleted back in to the database.</p> <p><b>Command Prompt – NetWorker Server</b></p> <ul style="list-style-type: none"> <li>Type: <code>scanner -im &lt;device_name&gt;</code></li> </ul> <p>Note: &lt;device_name&gt; should be replaced with the name of the device you loaded the tape into.</p>  <pre> Administrator: C:\Windows\system32\cmd.exe  C:\Users\Administrator&gt;scanner -im \\.\Tape2 8909:scanner: using '\\.\Tape2' as the device name 8936:scanner: scanning LTO Ultrium-4 tape E01002L4 on \\.\Tape2 32350:scanner: adding LTO Ultrium-4 tape E01002L4 to pool LibTest 29485:scanner: ssid 3091935753: scan complete 8786:scanner: ssid 3091935753: 1395 KB, 10 file(s) 29485:scanner: ssid 3041605164: scan complete 8786:scanner: ssid 3041605164: 1674 KB, 11 file(s) 8761:scanner: done with LTO Ultrium-4 tape E01002L4  C:\Users\Administrator&gt;_ </pre>																												
15	<p>Return to the <b>Media</b> tab and select <b>Tape Volumes</b> to display the list of tape volumes in the media database.</p> <p><b>Identify the volume</b> that you just scanned back in.</p>  <table border="1" data-bbox="362 1119 1485 1276"> <thead> <tr> <th>Volume Name</th> <th>Barcode</th> <th>Used</th> <th>% Used</th> <th>Mode</th> <th>Expiration</th> <th>Pool</th> </tr> </thead> <tbody> <tr> <td>E01001L4</td> <td>E01001L4</td> <td>0 KB</td> <td>0%</td> <td>appendable</td> <td></td> <td>LibTest</td> </tr> <tr> <td>E01002L4(R)</td> <td></td> <td>3840 KB</td> <td>0%</td> <td></td> <td>12/3/13</td> <td>LibTest</td> </tr> <tr> <td>E03001L4</td> <td></td> <td>299 MB</td> <td>0%</td> <td>appendable</td> <td>12/3/13</td> <td>LibTest</td> </tr> </tbody> </table> <p>What do you notice about the name and mode of this volume?</p> <p><b>Change the volume to appendable.</b></p> 	Volume Name	Barcode	Used	% Used	Mode	Expiration	Pool	E01001L4	E01001L4	0 KB	0%	appendable		LibTest	E01002L4(R)		3840 KB	0%		12/3/13	LibTest	E03001L4		299 MB	0%	appendable	12/3/13	LibTest
Volume Name	Barcode	Used	% Used	Mode	Expiration	Pool																							
E01001L4	E01001L4	0 KB	0%	appendable		LibTest																							
E01002L4(R)		3840 KB	0%		12/3/13	LibTest																							
E03001L4		299 MB	0%	appendable	12/3/13	LibTest																							

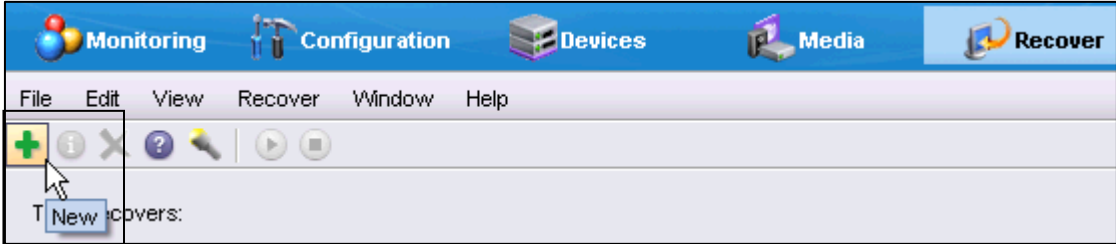
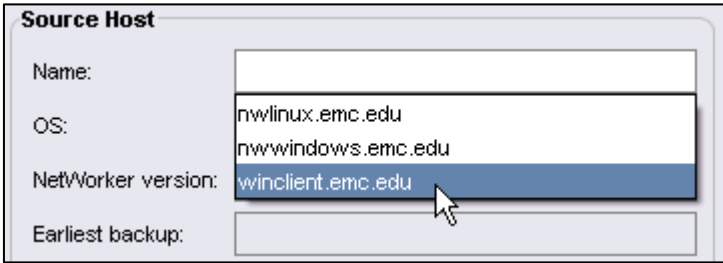
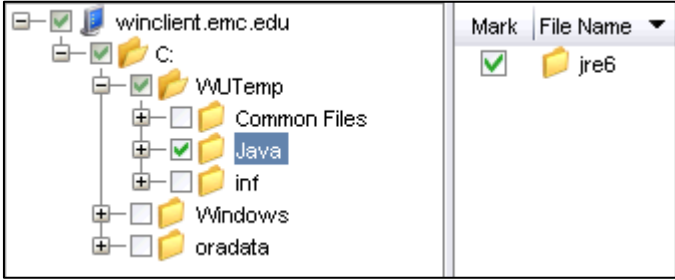
*End of Lab Exercise 7-2  
End of Lab 7*

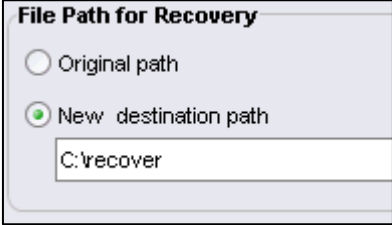
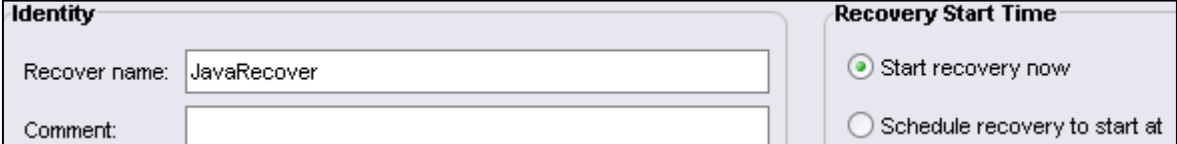
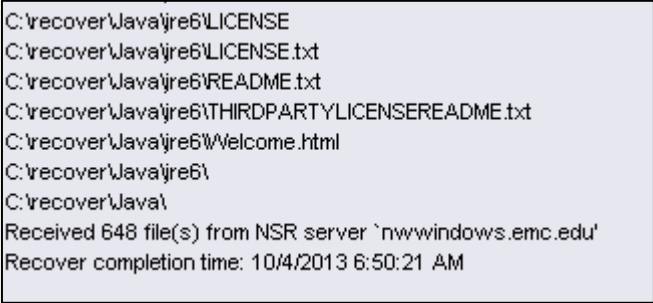
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## Lab 8: Perform Recoveries

<b>Purpose:</b>	In this lab, you perform browsable and save set recoveries using the NetWorker Recovery Wizard
<b>Tasks:</b>	In this lab you: <ul style="list-style-type: none"><li>• Perform a browsable recovery using NetWorker Recovery Wizard</li><li>• Perform a save set recovery using NetWorker Recovery Wizard</li><li>• Perform a scheduled recovery using NetWorker Recovery Wizard</li></ul>

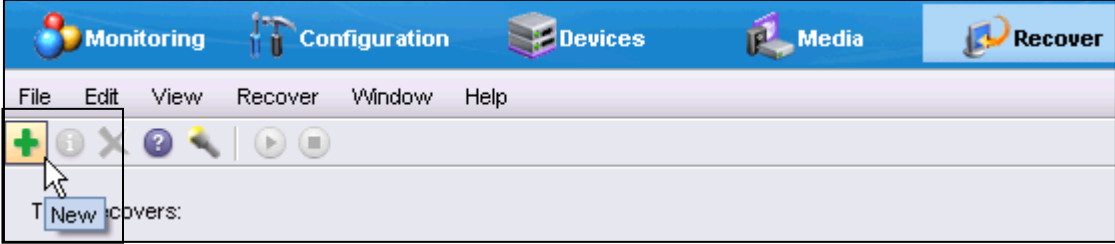
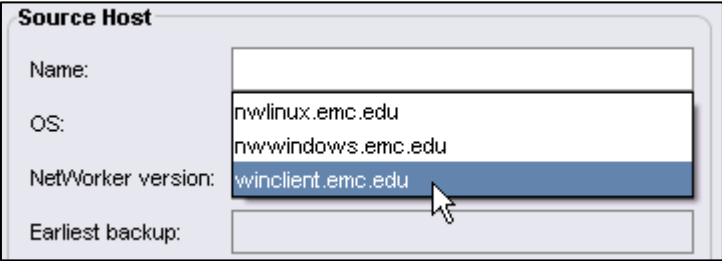
## Lab Exercise 8-1: Perform a Browsable Recovery

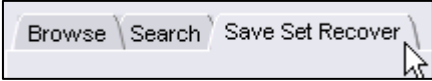
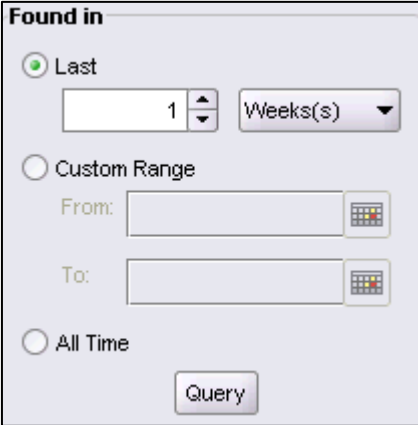
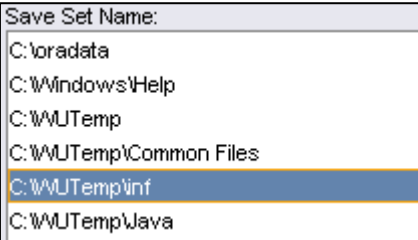
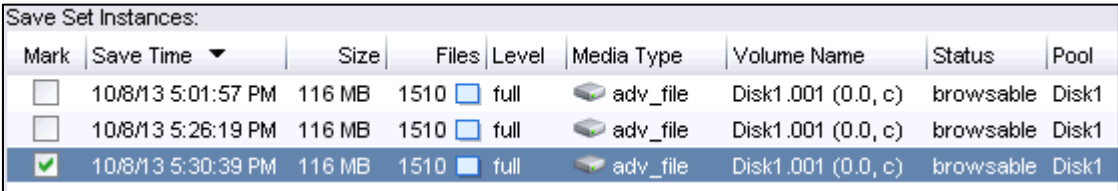
Step	Action
1	<p>From the <b>Recover</b> tab select the <b>green “+”</b> symbol to launch the <b>NetWorker Recovery Wizard</b>.</p> 
2	<p>In the <b>Recovery Configuration</b> wizard, create a new recovery configuration by entering the following information:</p> <p><b>Recover Configuration</b></p> <p><b>Select the Recovery Hosts</b></p> <ul style="list-style-type: none"> <li><b>Name:</b> Select <b>winclient.emc.edu</b></li> </ul>  <p>Click <b>Next</b>.</p>
3	<p>In the <b>Select the Data to Recover</b> dialog box, select the <b>C:\WUTemp\Java</b> folder in the folder selection tree.</p>  <p>Click <b>Next</b>.</p>

Step	Action
4	<p>In the <b>Select the Recovery Options</b> window enter the following options:  <b>Recovery Configuration</b>  <b>Select the Recovery Options</b></p> <ul style="list-style-type: none"> <li>• <u>File Path for Recovery:</u> <b>New destination path</b></li> <li>• <u>Recovery path box:</u> <b>C:\recover</b></li> </ul>  <p>Click <b>Next</b>.</p> <p>On the <b>Obtain the Volume Information</b> window, leave the <b>default</b> options.  Click <b>Next</b>.</p>
5	<p>In the <b>Perform the Recovery</b> window enter the following information:  <b>Recovery Configuration</b>  <b>Perform the Recovery</b></p> <ul style="list-style-type: none"> <li>• <u>Recover Name:</u> <b>JavaRecover</b></li> <li>• <u>Recovery Start Time:</u> <b>Start recovery now</b></li> </ul>  <p>Click <b>Run Recovery</b>, and monitor the <b>Recovery Results</b> screen until the recovery is completed.</p>  <pre> C:\recover\Java\jre6\LICENSE C:\recover\Java\jre6\LICENSE.txt C:\recover\Java\jre6\README.txt C:\recover\Java\jre6\THIRDPARTYLICENSEREADME.txt C:\recover\Java\jre6\Welcome.html C:\recover\Java\jre6\ C:\recover\Java\ Received 648 file(s) from NSR server 'nwwindows.emc.edu' Recover completion time: 10/4/2013 6:50:21 AM </pre> <p>Click <b>Finish</b>.</p>

*End of Lab Exercise 8-1*

## Lab Exercise 8-2: Perform Save Set Recoveries

Step	Action
1	<p>From the <b>Recover</b> tab select the <b>green “+”</b> symbol to launch the <b>NetWorker Recovery Wizard</b>.</p> 
2	<p>In the <b>Recovery Configuration</b> wizard, create a new recovery configuration by entering the following information:</p> <p><b>Recover Configuration</b></p> <p><b>Select the Recovery Hosts</b></p> <ul style="list-style-type: none"><li>• <b>Name:</b> Select <b>winclient.emc.edu</b></li></ul>  <p>Click <b>Next</b>.</p>

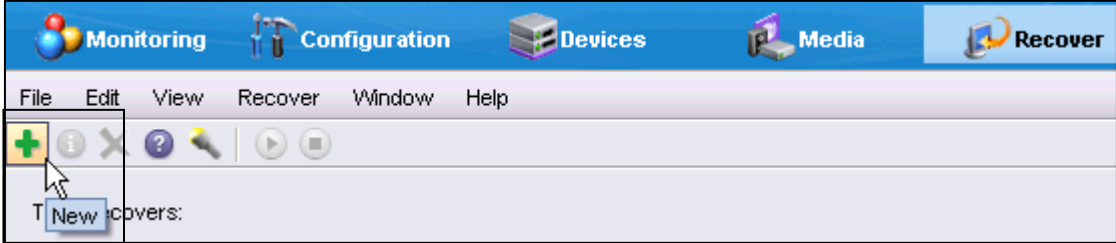
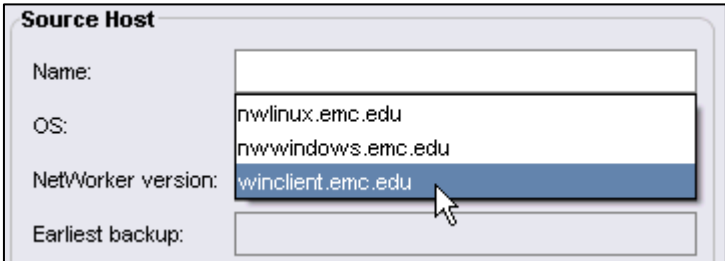
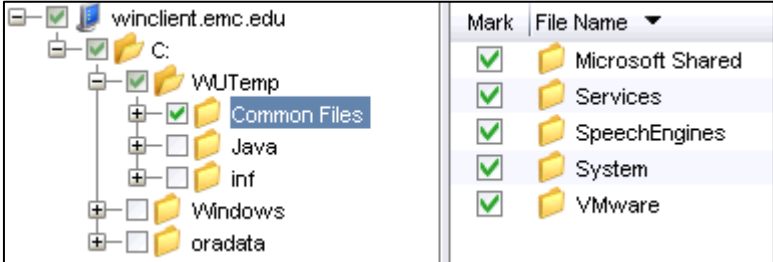
Step	Action
3	<p>In the <b>Select the Data to Recover</b> window, enter the following options:</p> <p><b>Recover Configuration</b></p> <p><b>Select the Data to Recover</b></p> <ul style="list-style-type: none"> <li>Click: <b>Save Set Recover</b></li> </ul>  <ul style="list-style-type: none"> <li><b>Found In:</b> Select <b>Last</b> and enter <b>1 Week</b></li> </ul>  <p>Click <b>Query</b>, to populate the <b>Save Set Name</b> and <b>Save Set Instances</b> windows.</p>
4	<p>In the <b>Save Set Name</b> field select the <b>C:\WUTemp\inf</b> save set.</p>  <p>In the <b>Save Set Instances</b> field, select the most <b>recent</b> instance and <b>mark</b> the box next to it.</p>  <p>Click <b>Next</b>.</p>




























Step	Action
5	<p>In the <b>Select the Recovery Options</b> window select the following options:</p> <p><b>Recover Configuration</b></p> <p><b>Select the Recovery Options</b></p> <ul style="list-style-type: none"> <li>• <u>File Path for Recovery</u>: <b>Original path</b></li> <li>• <u>Duplicate File Options</u>: <b>Rename the recovered file</b></li> </ul> <div data-bbox="646 411 1175 911" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>File Path for Recovery</b></p> <p><input checked="" type="radio"/> Original path</p> <p><input type="radio"/> New destination path</p> <p><input type="text"/></p> <hr/> <p><b>Duplicate File Options</b></p> <p><input checked="" type="radio"/> <span style="border: 1px solid orange; padding: 2px;">Rename the recovered file</span></p> <p><input type="radio"/> Do not recover the file</p> <p><input type="radio"/> Overwrite the existing file</p> <p><input type="checkbox"/> If overwrite fails, replace at reboot</p> </div> <p>Click <b>Next</b>.</p> <p>Leave the <b>default</b> options on the <b>Obtain the Volume Information</b> page. Click <b>Next</b>.</p>

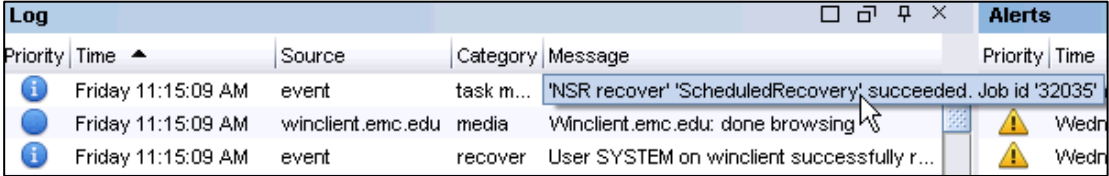
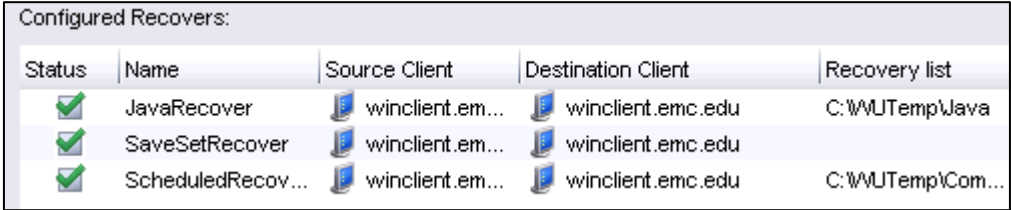
Step	Action		
6	<p>In the <b>Perform the Recovery</b> window enter the following information:</p> <p><b>Recovery Configuration</b></p> <p><b>Perform the Recovery</b></p> <ul style="list-style-type: none"> <li>• <u>Recover Name:</u> <b>SaveSetRecover</b></li> <li>• <u>Recovery Start Time:</u> <b>Start recovery now</b></li> </ul> <div data-bbox="321 409 1497 552" style="border: 1px solid black; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%; border-right: 1px solid black; padding: 5px;"> <p><b>Identity</b></p> <p>Recover name: <input style="width: 90%;" type="text" value="SaveSetRecover"/></p> <p>Comment: <input style="width: 90%;" type="text"/></p> </td> <td style="width: 30%; padding: 5px;"> <p><b>Recovery Start Time</b></p> <p><input checked="" type="radio"/> Start recovery now</p> <p><input type="radio"/> Schedule recovery to start at</p> </td> </tr> </table> </div> <p>Click <b>Run Recovery</b>, and monitor the <b>Recovery Results</b> screen until the recovery is completed.</p> <div data-bbox="496 695 1325 1050" style="border: 1px solid black; padding: 5px;"> <pre> C:\WUTemp\inf\wvms_mp.inf C:\WUTemp\inf\wvms_mp.inf: File exists, renaming to C:\WUTemp\inf\~wvms_mp.inf C:\WUTemp\inf\wvms_pp.inf C:\WUTemp\inf\wvms_pp.inf: File exists, renaming to C:\WUTemp\inf\~wvms_pp.inf C:\WUTemp\inf\xnacc.inf C:\WUTemp\inf\xnacc.inf: File exists, renaming to C:\WUTemp\inf\~xnacc.inf C:\WUTemp\inf\xnacc.PNF C:\WUTemp\inf\xnacc.PNF: File exists, renaming to C:\WUTemp\inf\~xnacc.PNF C:\WUTemp\inf\ Received 1507 matching file(s) from NSR server `nwwindows.emc.edu' Recover completion time: 10/4/2013 7:43:04 AM </pre> </div> <p>Review the <b>Recovery Log</b> and determine how the files were renamed.</p> <p><u>Hint:</u> What change was made to the filename when the file was renamed?</p> <p>Click <b>Finish</b>.</p>	<p><b>Identity</b></p> <p>Recover name: <input style="width: 90%;" type="text" value="SaveSetRecover"/></p> <p>Comment: <input style="width: 90%;" type="text"/></p>	<p><b>Recovery Start Time</b></p> <p><input checked="" type="radio"/> Start recovery now</p> <p><input type="radio"/> Schedule recovery to start at</p>
<p><b>Identity</b></p> <p>Recover name: <input style="width: 90%;" type="text" value="SaveSetRecover"/></p> <p>Comment: <input style="width: 90%;" type="text"/></p>	<p><b>Recovery Start Time</b></p> <p><input checked="" type="radio"/> Start recovery now</p> <p><input type="radio"/> Schedule recovery to start at</p>		

*End of Lab Exercise 8-2*

## Lab Exercise 8-3: Perform Scheduled Recovery

Step	Action
1	<p>From the <b>Recover</b> tab select the <b>green “+”</b> symbol to launch the <b>NetWorker Recovery Wizard</b>.</p> 
2	<p>In the <b>Recovery Configuration</b> wizard, create a new recovery configuration by entering the following information:</p> <p><b>Recover Configuration</b></p> <p><b>Select the Recovery Hosts</b></p> <ul style="list-style-type: none"> <li><b>Name:</b> Select <b>winclient.emc.edu</b></li> </ul>  <p>Click <b>Next</b>.</p>
3	<p>In the <b>Select the Data to Recover</b> dialog box, select the <b>C:\WUTemp\Common Files</b> folder in the folder selection tree.</p>  <p>Click <b>Next</b>.</p>

Step	Action																												
4	<p>In the <b>Select the Recovery Options</b> window enter the following options:  <b>Recovery Configuration</b>  <b>Select the Recovery Options</b></p> <ul style="list-style-type: none"> <li>• <u>File Path for Recovery:</u> <b>New destination path</b></li> <li>• <u>Recovery path box:</u> <b>C:\recover</b></li> </ul> <div data-bbox="716 409 1105 632" style="border: 1px solid gray; padding: 5px; margin: 10px auto; width: fit-content;"> <p><b>File Path for Recovery</b></p> <p><input type="radio"/> Original path</p> <p><input checked="" type="radio"/> New destination path</p> <p>C:\recover</p> </div> <p>Click <b>Next</b>.</p> <p>On the <b>Obtain the Volume Information</b> window, leave the <b>default</b> options.  Click <b>Next</b>.</p>																												
5	<p>In the <b>Perform the Recovery</b> window enter the following information:  <b>Recovery Configuration</b>  <b>Perform the Recovery</b></p> <ul style="list-style-type: none"> <li>• <u>Recover Name:</u> <b>ScheduledRecovery</b></li> <li>• <u>Recovery Start Time:</u> <b>Scheduled recovery to start at</b></li> <li>• <u>Recovery time box:</u> <b>Select today's date and then set the time to 10 minutes from now</b></li> </ul> <div data-bbox="328 1119 1495 1318" style="border: 1px solid gray; padding: 5px; margin: 10px auto;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Identity</th> <th style="width: 40%;">Recovery Start Time</th> </tr> </thead> <tbody> <tr> <td>Recover name: <input type="text" value="ScheduledRecovery"/></td> <td><input type="radio"/> Start recovery now</td> </tr> <tr> <td>Comment: <input type="text"/></td> <td><input checked="" type="radio"/> Schedule recovery to start at</td> </tr> <tr> <td></td> <td><input type="text" value="Oct 4, 2013 11:15:00 AM"/></td> </tr> </tbody> </table> </div> <p><b>Note:</b> When selecting the recovery time, select today, then click ok to acknowledge the error and then manually enter the time box to display a time 10 minutes from now.</p> <p>Click <b>Schedule Recovery</b>, and note that a new recovery session is created under <b>Configured Recovers</b>.</p> <div data-bbox="409 1604 1414 1808" style="border: 1px solid gray; padding: 5px; margin: 10px auto;"> <p>Configured Recovers:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Status</th> <th>Name</th> <th>Source Client</th> <th>Destination Client</th> <th>Recovery list</th> </tr> </thead> <tbody> <tr> <td></td> <td>ScheduledRecov...</td> <td> winclient.em...</td> <td> winclient.emc.edu</td> <td>C:\WUTemp\Com...</td> </tr> <tr> <td></td> <td>JavaRecover</td> <td> winclient.em...</td> <td> winclient.emc.edu</td> <td>C:\WUTemp\Java</td> </tr> <tr> <td></td> <td>SaveSetRecover</td> <td> winclient.em...</td> <td> winclient.emc.edu</td> <td></td> </tr> </tbody> </table> </div>	Identity	Recovery Start Time	Recover name: <input type="text" value="ScheduledRecovery"/>	<input type="radio"/> Start recovery now	Comment: <input type="text"/>	<input checked="" type="radio"/> Schedule recovery to start at		<input type="text" value="Oct 4, 2013 11:15:00 AM"/>	Status	Name	Source Client	Destination Client	Recovery list		ScheduledRecov...	 winclient.em...	 winclient.emc.edu	C:\WUTemp\Com...		JavaRecover	 winclient.em...	 winclient.emc.edu	C:\WUTemp\Java		SaveSetRecover	 winclient.em...	 winclient.emc.edu	
Identity	Recovery Start Time																												
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	JavaRecover	 winclient.em...	 winclient.emc.edu	C:\WUTemp\Java																									
	SaveSetRecover	 winclient.em...	 winclient.emc.edu																										

Step	Action
6	<p>Wait until after the scheduled time and <b>validate</b> that the recovery <b>completes</b> successfully. You should see the NSR recover task complete in the log.</p>  <p>Additionally, once completed the <b>ScheduledRecovery</b> task should have a green check mark next to it.</p> 

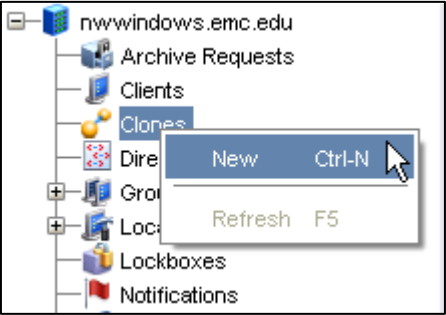
*End of Lab Exercise 8-3*

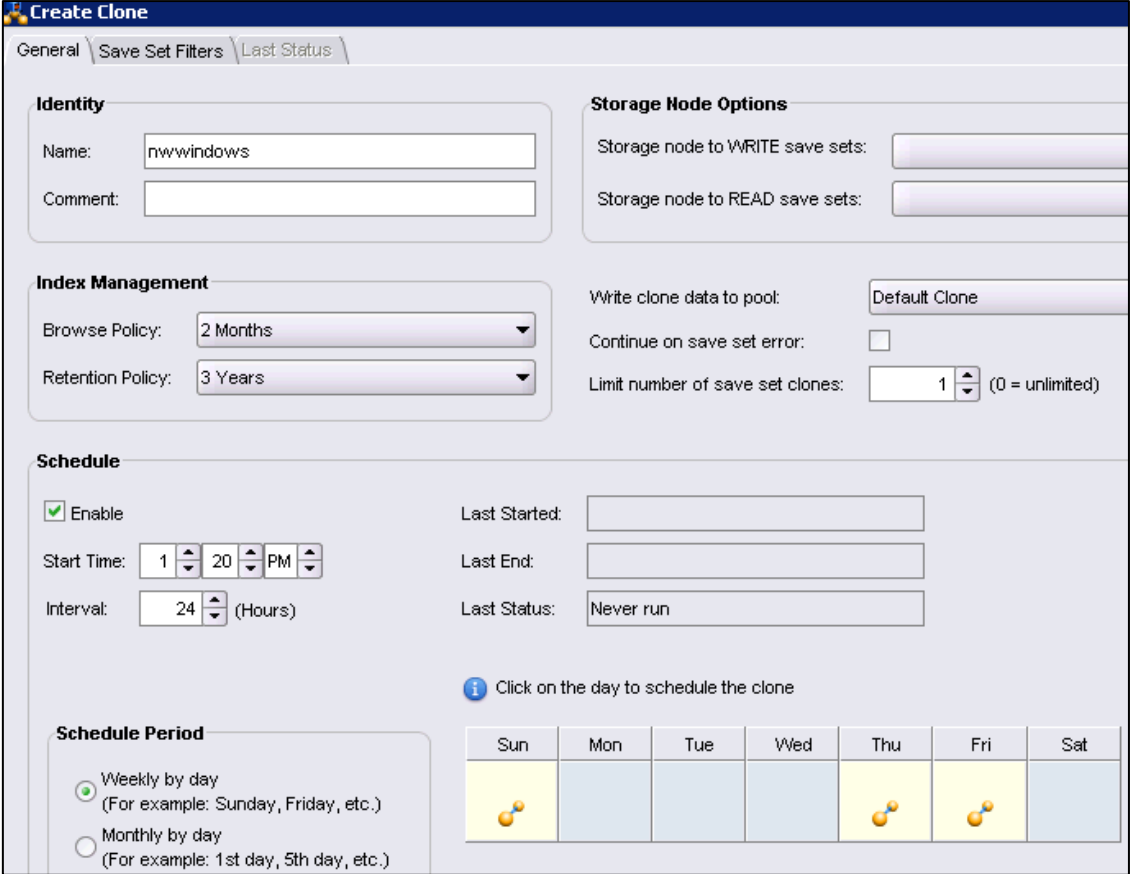
*End of Lab 8*

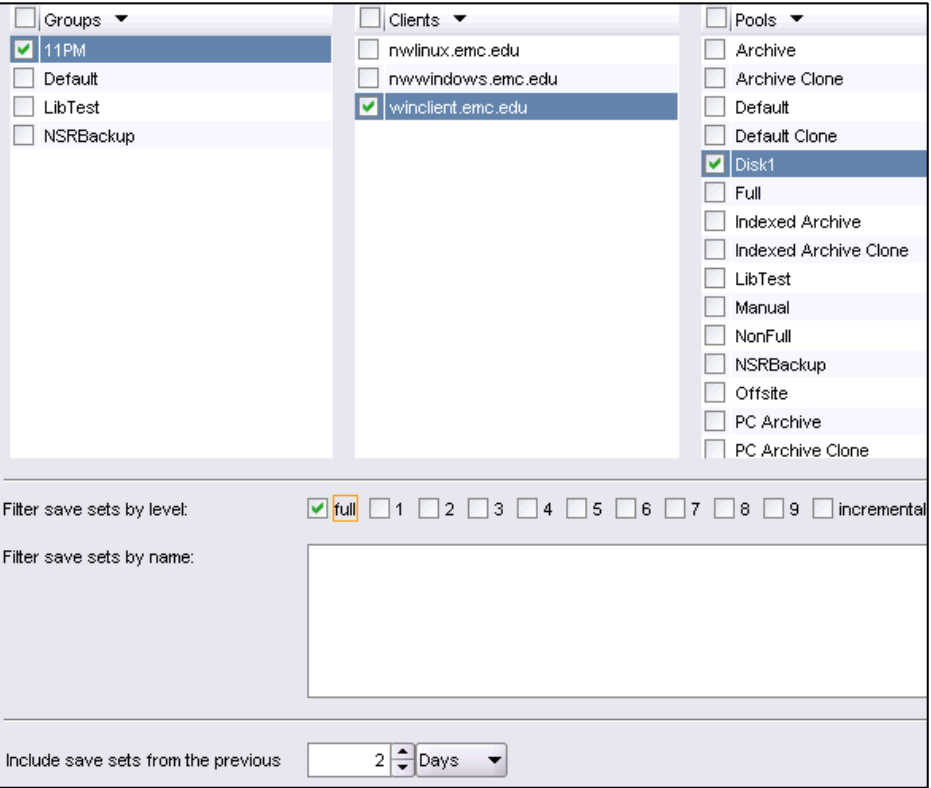
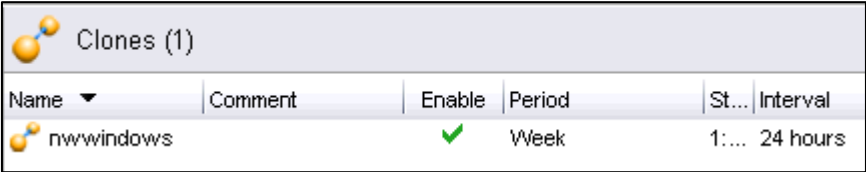
## Lab 9: Perform Cloning and Staging

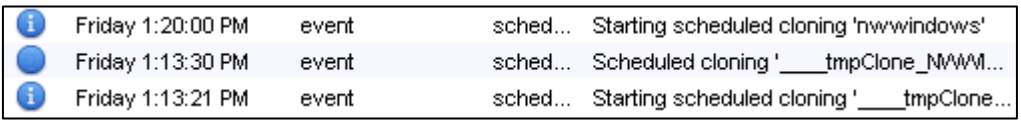
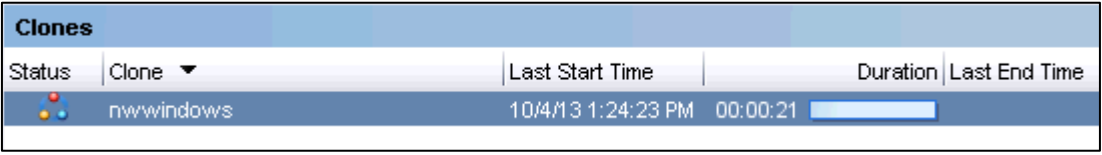
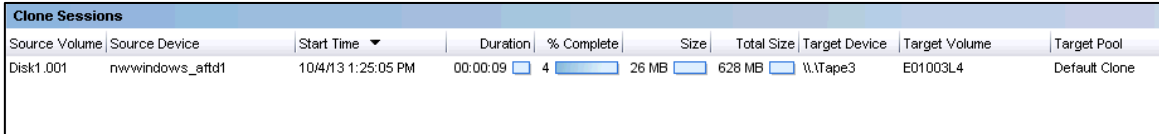
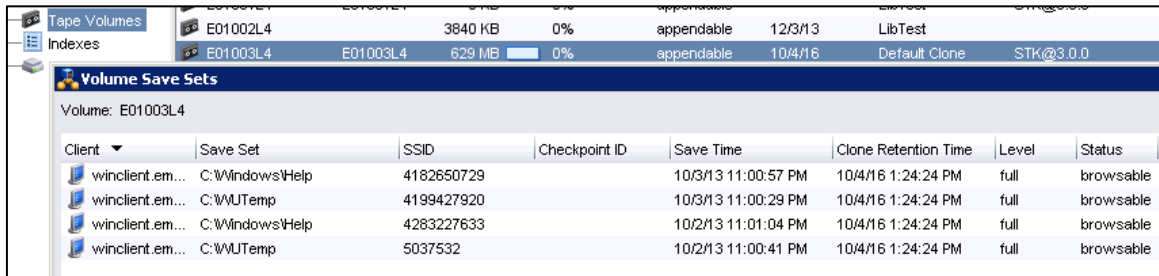
<b>Purpose:</b>	In this lab, you will configure resources for cloning and staging, and use them to perform cloning and staging operations.
<b>Tasks:</b>	In this lab, you will: <ul style="list-style-type: none"><li>• Configure a clone resource.</li><li>• Run the scheduled clone.</li><li>• Configure a staging resource.</li><li>• Manually stage a save set.</li></ul>

## Lab Exercise 9-1: Configure a Scheduled Clone Operation

Step	Action
1	<p>From the <b>Configuration</b> tab, <b>Right-click Clones</b> on the left and create a <b>New</b> clone resource.</p>  <p>The screenshot shows a tree view of configuration objects. The root is 'nwwindows.emc.edu'. Underneath are 'Archive Requests', 'Clients', 'Clones', 'Dire', 'Gro', 'Loc', 'Lockboxes', and 'Notifications'. A context menu is open over the 'Clones' node, showing 'New Ctrl-N' and 'Refresh F5' options. A mouse cursor is pointing at the 'New Ctrl-N' option.</p> <p>Continue to <b>Step 2</b>.</p>


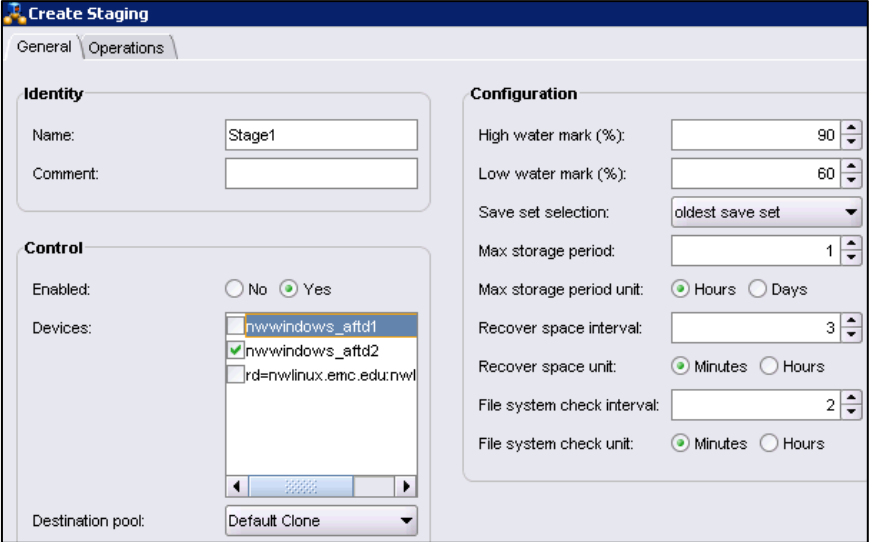
Step	Action
2	<p>Configure the clone resource with the following properties:</p> <p><b>Create Clone</b></p> <p><b>General Tab</b></p> <ul style="list-style-type: none"> <li>• <u>Name</u>: Enter the short name of your NetWorker server</li> <li>• <u>Browse Policy</u>: 2 Months</li> <li>• <u>Retention Policy</u>: 3 Years</li> <li>• <u>Start Time</u>: 2:00 PM (Choose a time when you can monitor the operation)</li> <li>• <u>Interval</u>: 24 Hours</li> <li>• <u>Write clone data to pool</u>: Default Clone</li> <li>• <u>Days to run scheduled clone</u>: Select Today and Tomorrow</li> </ul>  <p>The screenshot shows the 'Create Clone' configuration window with the following settings:</p> <ul style="list-style-type: none"> <li><b>Identity</b>: Name: nwwindows, Comment: (empty)</li> <li><b>Storage Node Options</b>: Storage node to WRITE save sets: (empty), Storage node to READ save sets: (empty)</li> <li><b>Index Management</b>: Browse Policy: 2 Months, Retention Policy: 3 Years</li> <li><b>Write clone data to pool</b>: Default Clone</li> <li><b>Continue on save set error</b>: <input type="checkbox"/></li> <li><b>Limit number of save set clones</b>: 1 (0 = unlimited)</li> <li><b>Schedule</b>: <input checked="" type="checkbox"/> Enable, Start Time: 1:20 PM, Interval: 24 (Hours), Last Started: (empty), Last End: (empty), Last Status: Never run</li> <li><b>Schedule Period</b>: Weekly by day (selected), Monthly by day (unselected)</li> <li><b>Schedule Calendar</b>: Sun, Mon, Tue, Wed, Thu, Fri, Sat. Sun, Thu, and Fri are highlighted with a yellow background and a clock icon.</li> </ul> <p>Continue to <b>Step 3</b>.</p>

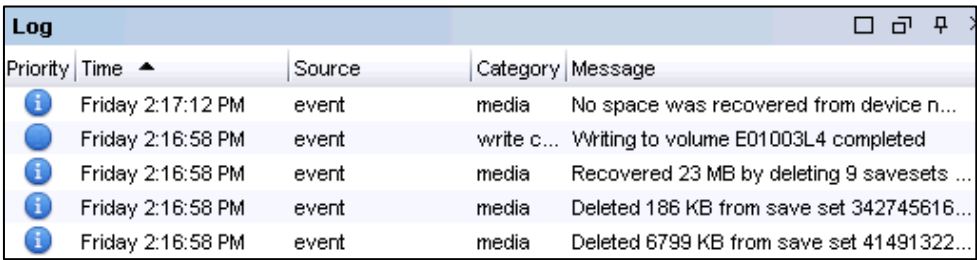
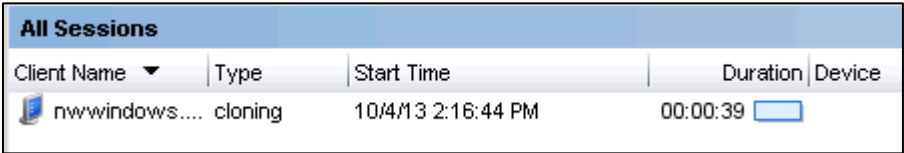
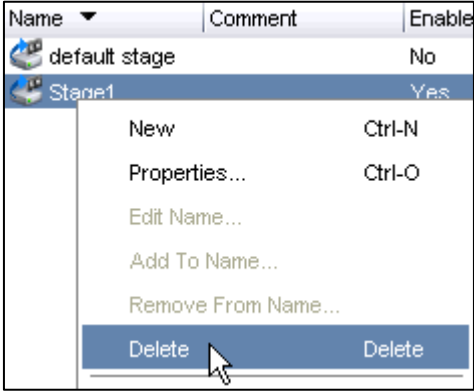
Step	Action
3	<p>In the <b>Create Clone</b> window select the <b>Save Set Filters</b> tab and enter the following:</p> <p><b>Create Clone</b></p> <p><b>Save Set Filters Tab</b></p> <ul style="list-style-type: none"> <li>• <u>Groups:</u> <b>11PM</b></li> <li>• <u>Clients:</u> <b>winclient.emc.edu</b></li> <li>• <u>Pools:</u> <b>Disk1</b></li> <li>• <u>Filter save sets by level:</u> <b>Full</b></li> <li>• <u>Include save sets from the previous:</u> <b>2 Days</b></li> </ul>  <p>Click <b>Preview Save Set Selection</b> to see a list of save sets that will be cloned.</p> <p>Click <b>OK</b> to finish creating your clone resource.</p>  <p>Monitor your NetWorker server during the time the clone is scheduled to run.</p> <p><u>Note:</u> Alternatively, you can right-click the clone job from the Monitoring tab to initiate it manually instead of waiting for it to run.</p>

Step	Action
4	<p>When the clone job runs, monitor the clone job activity on the <b>monitoring</b> tab.</p> <p>The <b>Log</b> window should show messages indicating the start of the scheduled clone.</p>  <p>The <b>Clones</b> window (opened by clicking the <b>Clones</b> tab in the upper window of the <b>Monitoring</b> tab) should show the clone operation running.</p>  <p>The <b>Clone Sessions</b> window (opened by clicking the <b>Clone Sessions</b> tab in the <b>sessions</b> window) should display the clone operations in progress.</p> 
5	<p>Verify that the save sets were successfully cloned, by switching to the <b>Media</b> tab and viewing the contents of the <b>tape volume</b> in the <b>Default Clone</b> pool.</p> 

*End of Lab Exercise 9-1*

## Lab Exercise 9-2: Configure Automatic Staging

Step	Action
1	<p>From the <b>Monitoring</b> tab of the <b>NetWorker Administration GUI</b> Perform a backup of the <b>11PM</b> group.</p> <div style="text-align: center;">  </div>
2	<p>From the <b>Configuration</b> tab right-click <b>Staging</b> and create a <b>New</b> staging resource with the following properties:</p> <p><b>Create Staging</b></p> <p><b>General Tab</b></p> <ul style="list-style-type: none"> <li>• <u>Name</u>: <b>Stage1</b></li> <li>• <u>Enabled</u>: <b>Yes</b></li> <li>• <u>Devices</u>: Select <b>1</b> of the <b>3</b> AFTD's</li> <li>• <u>Destination Pool</u>: <b>Default Clone</b></li> <li>• <u>Save Set Selection</u>: <b>oldest save set</b></li> <li>• <u>Max storage period</u>: <b>1 Hour</b></li> <li>• <u>Recover space interval</u>: <b>3 Minutes</b></li> <li>• <u>File system check interval</u>: <b>2 Minutes</b></li> </ul> <div style="text-align: center;">  </div> <p>Click <b>OK</b>.</p>

Step	Action
4	<p>On the <b>Monitoring</b> tab, watch for staging to occur over the next few minutes.</p> <p>The <b>Log</b> window should display messages indicating the staging session is starting and has finished.</p>  <p>Note that clone sessions are running in the <b>Sessions</b> window.</p> <p><u>Note:</u> These are identified as clone sessions however the log will show save sets deleted after the clone operation which is the difference between a clone and a staging operation.</p> 
5	<p>Once the staging has completed, return to the <b>Configuration</b> tab and <b>delete</b> the <b>staging policy</b> that you created.</p> 

*End of Lab Exercise 9-2*

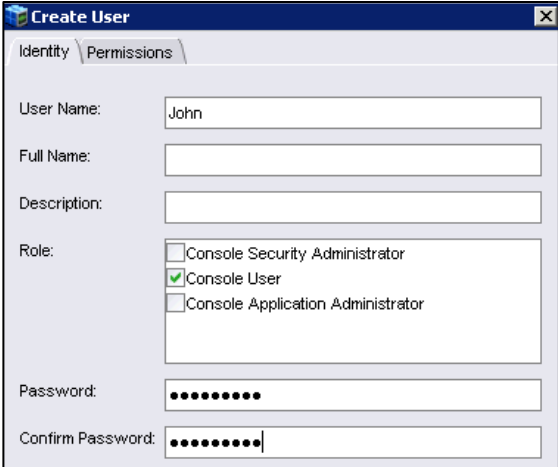
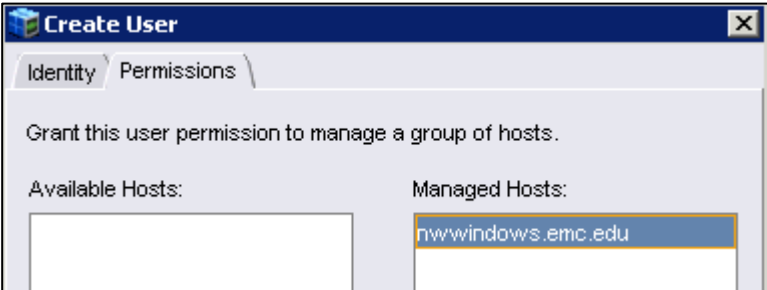
*End of Lab 9*

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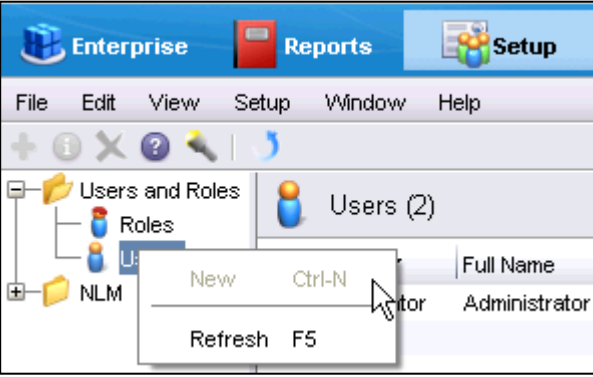
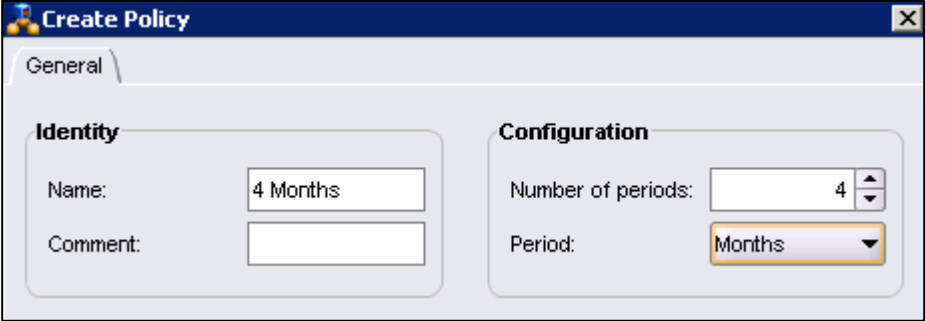
## Lab 11: Administer the NetWorker Server

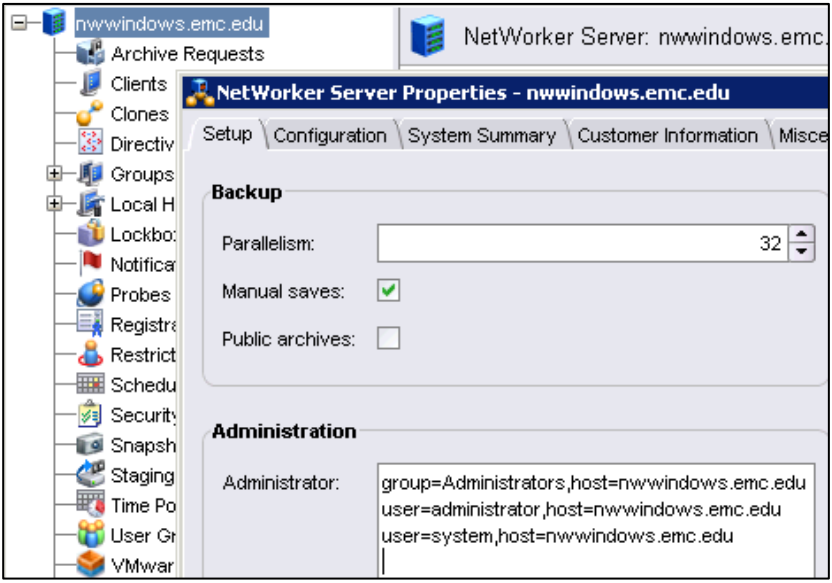
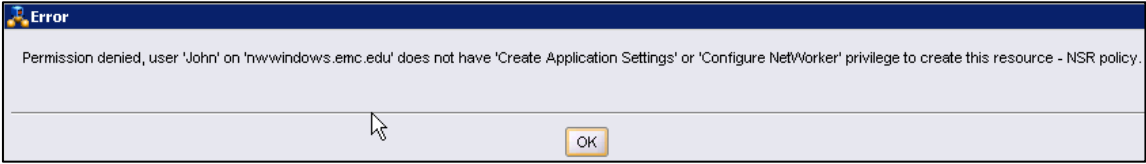
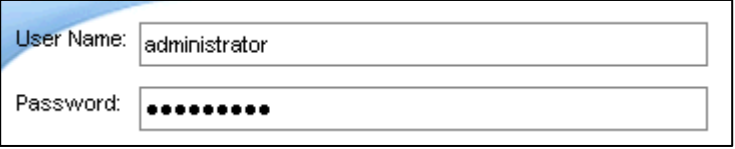
<b>Purpose:</b>	In this lab, you will perform several tasks relating to the management and administration of the NetWorker Server.
<b>Tasks:</b>	In this lab you: <ul style="list-style-type: none"><li>• Create a new Console user.</li><li>• Generate canned reports and create custom reports.</li><li>• Back up the Console database.</li><li>• Enable Resource Update Logging.</li><li>• View the contents of several NetWorker and GST log files.</li><li>• Create a new NetWorker user group.</li><li>• Create an owner notification for the winclient client.</li></ul>

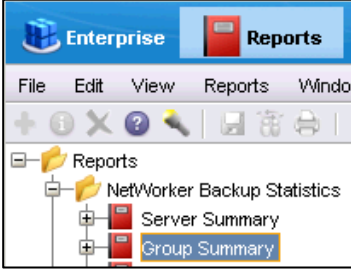
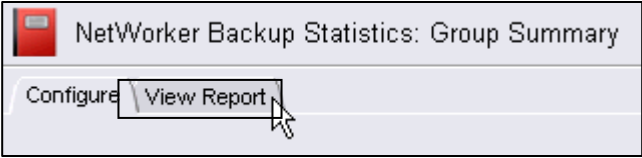
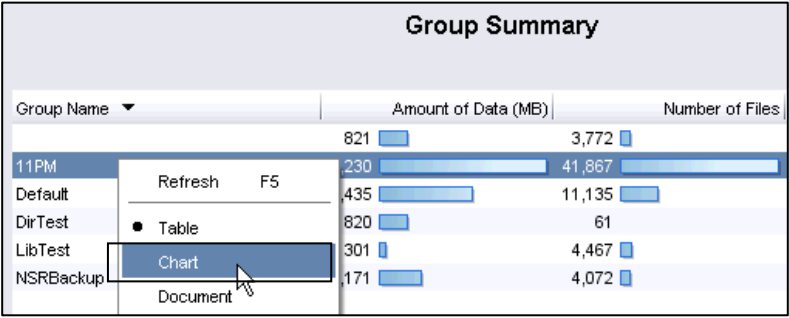
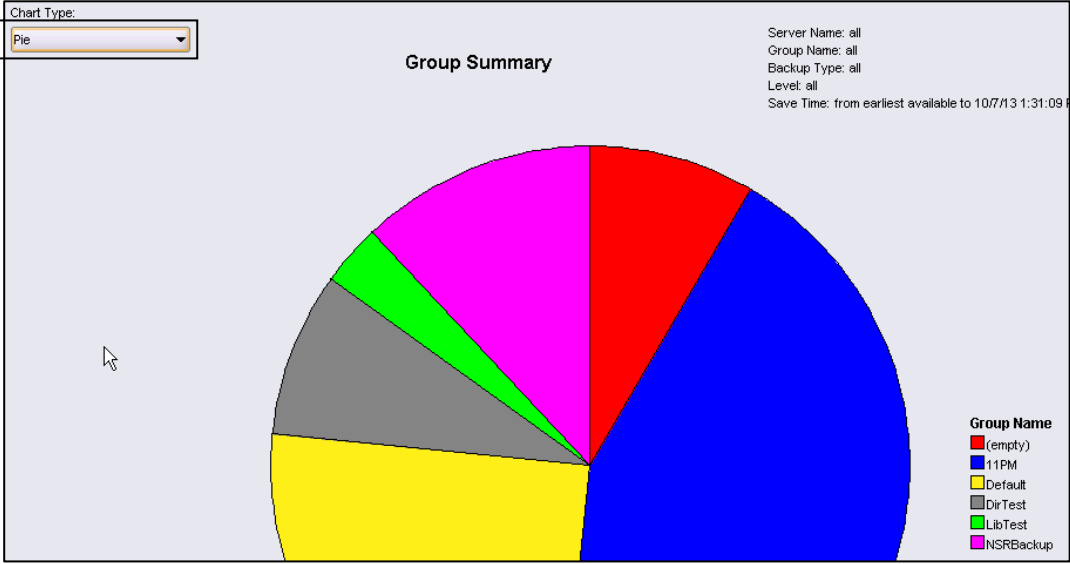
## Lab Exercise 11-1: Manage the Console Server

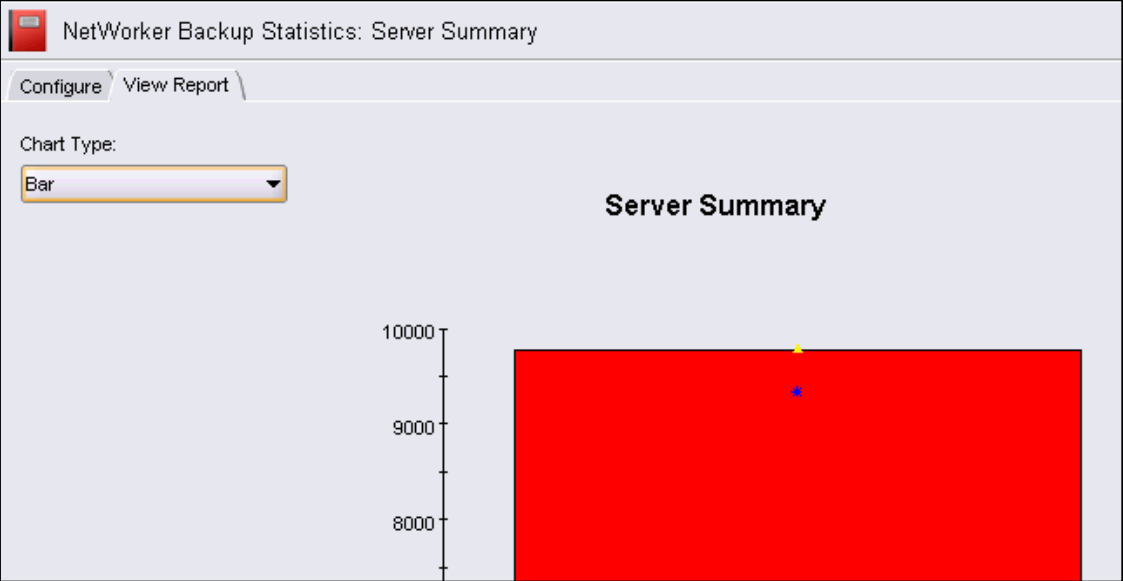
Step	Action
1	<p>From the <b>Setup</b> tab in the <b>NetWorker Management Console</b> right-click <b>Users</b> and create a <b>New</b> Console user with the following properties:</p> <p><b>Create User</b></p> <p><b>Identity Tab</b></p> <ul style="list-style-type: none"><li>• <u>User Name</u>: <b>John</b></li><li>• <u>Password</u>: <b>password1</b></li></ul>  <p><b>Permissions Tab</b></p> <ul style="list-style-type: none"><li>• <u>Managed Hosts</u>: <u>Windows NetWorker Server</u>: <b>nwwindows.emc.edu</b> <u>Linux NetWorker Server</u>: <b>nwlinux.emc.edu</b></li></ul>  <p>Click <b>OK</b>.</p>

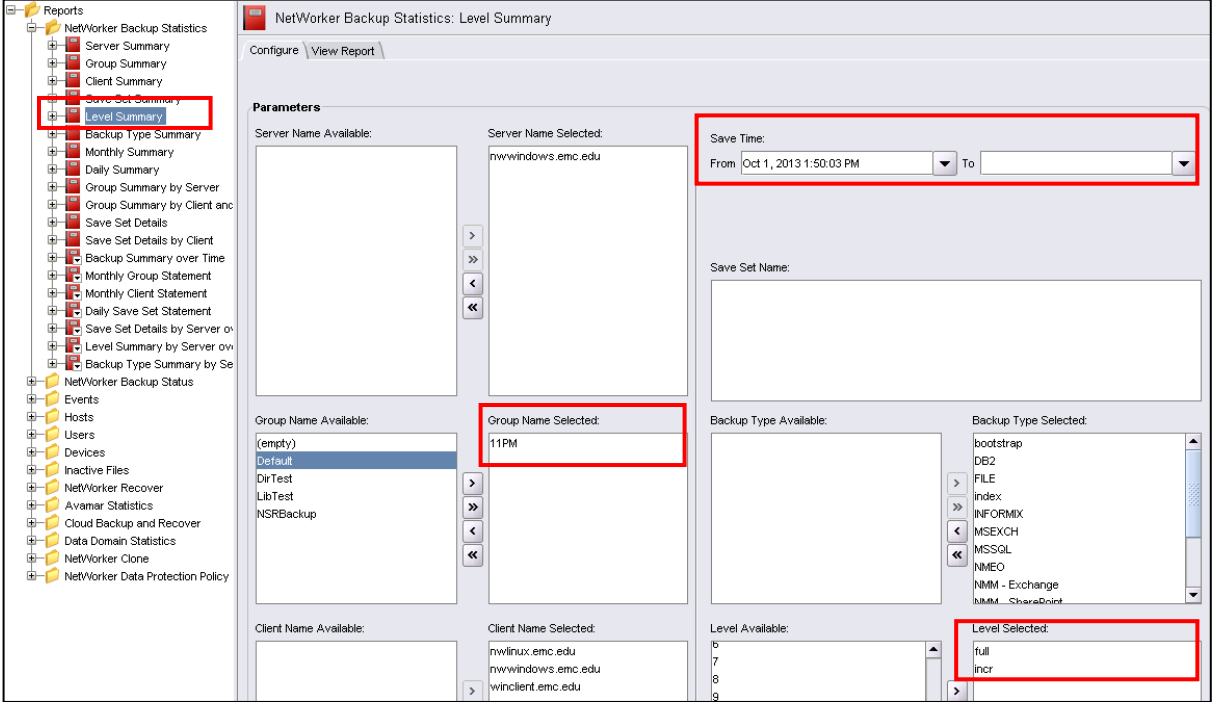
Step	Action
2	<p>From the <b>Configuration</b> tab <b>right-click</b> the name of your <b>NetWorker</b> server in the top of the tree and select <b>Properties</b>. Make the following additions:</p> <p><b>NetWorker Server Properties</b>  <b>Setup Tab</b></p> <ul style="list-style-type: none"> <li>• <u>Administrator</u>: append <b>user=John,host=&lt;FQDN of NetWorker Server&gt;</b></li> </ul> <div data-bbox="553 409 1292 993" data-label="Image"> <p>The screenshot shows the 'NetWorker Server Properties' window for 'nwwindows.emc.edu'. The 'Setup' tab is selected. Under the 'Administration' section, the 'Administrator' list contains the following entries: 'group=Administrators,host=nwwindows.emc.edu', 'user=administrator,host=nwwindows.emc.edu', 'user=system,host=nwwindows.emc.edu', and 'user=John,host=nwwindows.emc.edu'. The last entry is highlighted with a mouse cursor.</p> </div> <p>Click <b>OK</b>.</p>
3	Close all NetWorker Administration and Console windows.
4	<p>Launch NMC and log in as <b>John</b>.</p> <div data-bbox="509 1278 1336 1671" data-label="Image"> <p>The screenshot shows the 'EMC NetWorker V8.1 Management Console' login screen. The 'User Name' field contains the text 'John'. The 'Password' field is masked with a series of dots.</p> </div>


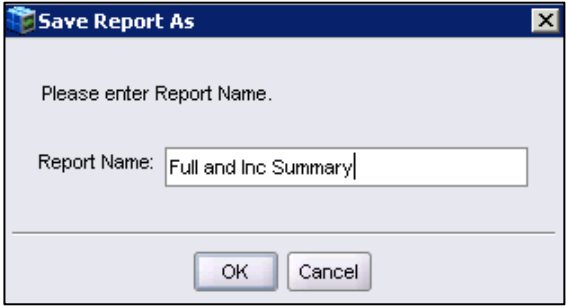
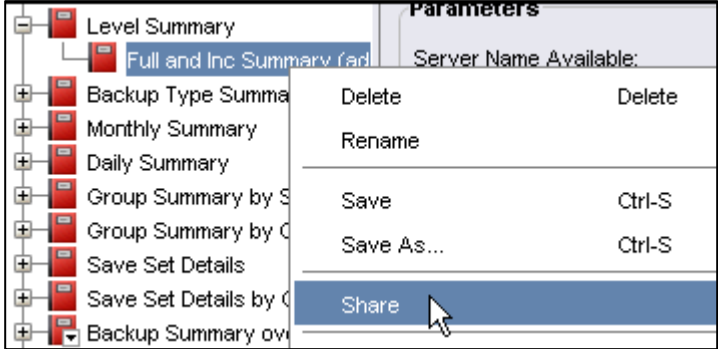
Step	Action
5	<p>From the <b>Setup</b> tab, attempt to create a new console user named <b>Sally</b>.            Attempt to create another Console user named <b>Sally</b>. Why are you not able to?</p>  <p><u>Note:</u> Only users with the role of <b>Console Security Administrator</b> are allowed to create, modify, or delete a Console user.</p>
6	<p>While still logged in as <b>John</b>, launch the <b>NetWorker Administration GUI</b> for your NetWorker server.</p>
7	<p>Create a <b>new time policy</b> resource with the following properties:</p> <p><b>Create Policy</b></p> <ul style="list-style-type: none"> <li>• <u>Name:</u> <b>4 Months</b></li> <li>• <u>Number of periods:</u> <b>4</b></li> <li>• <u>Period:</u> <b>Months</b></li> </ul>  <p>Click <b>OK</b>.</p>

Step	Action
8	<p>Remove <b>John</b> from your NetWorker server's administrator list.</p> 
9	<p>Try to create a new <b>5 Months</b> policy resource.</p>  <p>Notice that you no longer have permission to create a new resource.</p>
10	<p>Close all NetWorker and Console windows.</p>
11	<p>Launch NMC and log in as <b>administrator</b>.</p> 

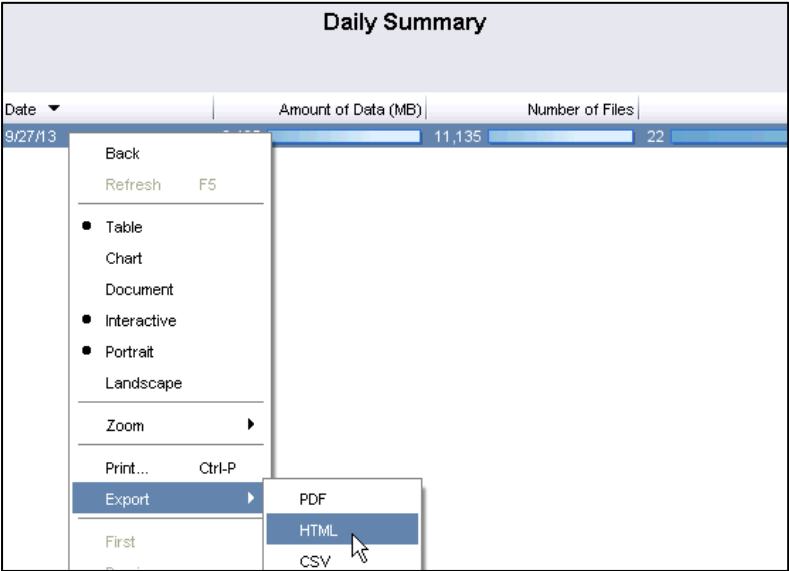
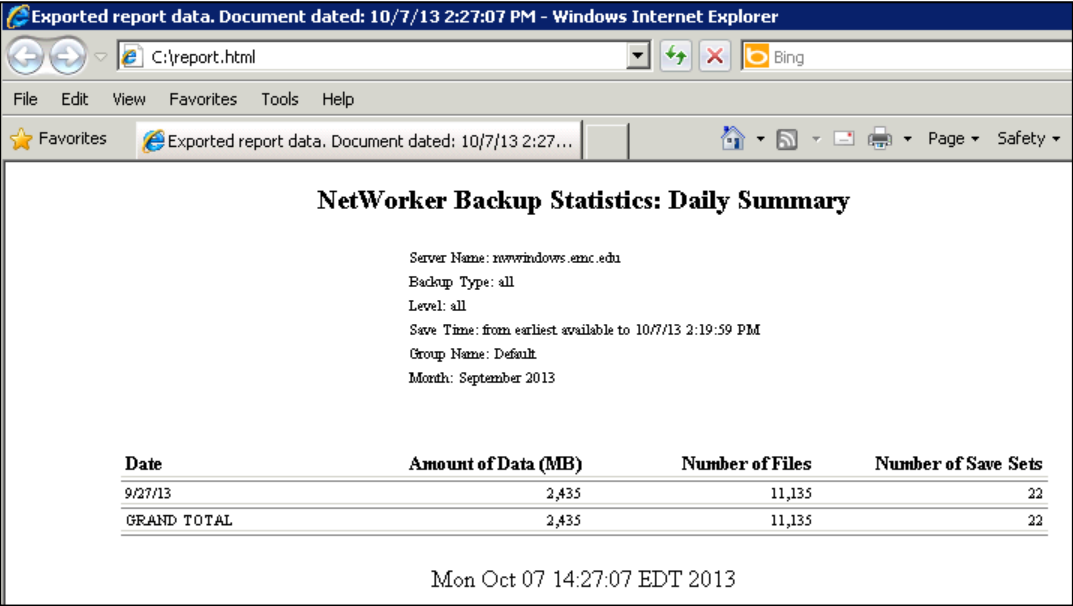
Step	Action
12	<p data-bbox="321 197 1409 260">From the <b>Reports</b> tab, expand the <b>NetWorker Backup Statistics</b> folder and select the <b>Group Summary</b> report.</p>  <p data-bbox="321 606 1195 638">Select the <b>View Report</b> tab to run the report with the default parameters.</p>  <p data-bbox="321 869 1279 900">Right-click anywhere on the report and select <b>Chart</b> to change the report format.</p>  <p data-bbox="321 1268 896 1299">From the <b>Chart Type</b> pull-down menu select <b>Pie</b>.</p> 

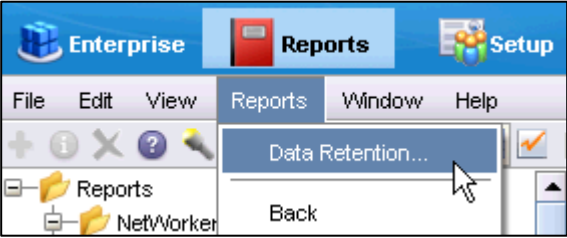
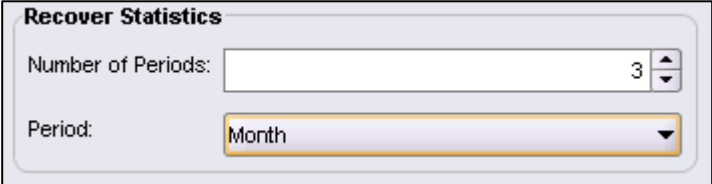
Step	Action
13	<p data-bbox="321 195 1312 226">From the <b>Reports</b> tab run the <b>Server Summary</b> report with the <b>default parameters</b>.</p>  <p data-bbox="321 653 898 684">Modify the report to be displayed as a <b>bar</b> chart.</p> 

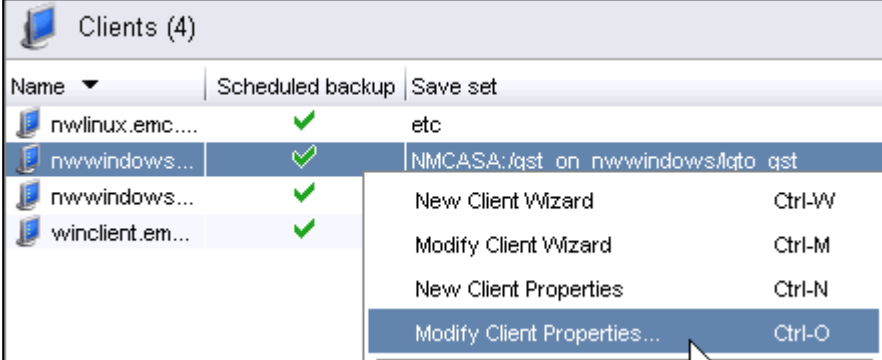
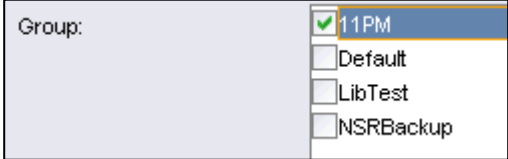
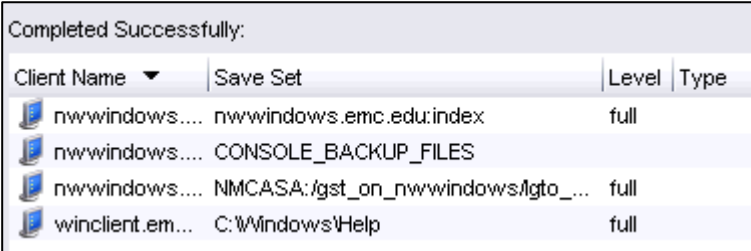
Step	Action
14	<p>Run the <b>Level Summary</b> report and configure it to show only <b>full</b> and <b>incr</b> save sets backed up by the <b>NetWorker server</b> as part of the <b>11pm</b> group within the <b>last week</b>.</p>  <p>Click <b>View Report</b> and go to the next step.</p>

Step	Action
15	<p data-bbox="321 195 1448 226"><b>Right-click</b> the report you just ran and select <b>Save As</b>. Save the report as <b>Full and Inc Summary</b>.</p> <div data-bbox="597 264 1250 436">  <p>A screenshot of a report menu. The menu items are: Save Set Summary, Level Summary, Backup Type Summary, Monthly Summary, and Daily Summary. The 'Save As...' option is highlighted in blue, and a mouse cursor is pointing at it. The keyboard shortcut 'Ctrl-S' is shown to the right of 'Save As...'. Below the menu items is the option 'Hide Other Users' Reports'.</p> </div> <div data-bbox="646 474 1208 777">  <p>A screenshot of the 'Save Report As' dialog box. The title bar says 'Save Report As'. The text inside says 'Please enter Report Name.' Below this is a text input field containing 'Full and Inc Summary'. At the bottom of the dialog are 'OK' and 'Cancel' buttons.</p> </div> <p data-bbox="321 814 1312 846">Right-click the report you created and select <b>Share</b> to share it with all console users.</p> <div data-bbox="565 884 1279 1230">  <p>A screenshot of a report menu. The menu items are: Level Summary, Full and Inc Summary (selected), Backup Type Summary, Monthly Summary, Daily Summary, Group Summary by S, Group Summary by C, Save Set Details, Save Set Details by C, and Backup Summary over. The 'Share' option is highlighted in blue, and a mouse cursor is pointing at it. To the right of the menu is a 'Parameters' section with 'Server Name Available:' and two 'Delete' buttons.</p> </div>



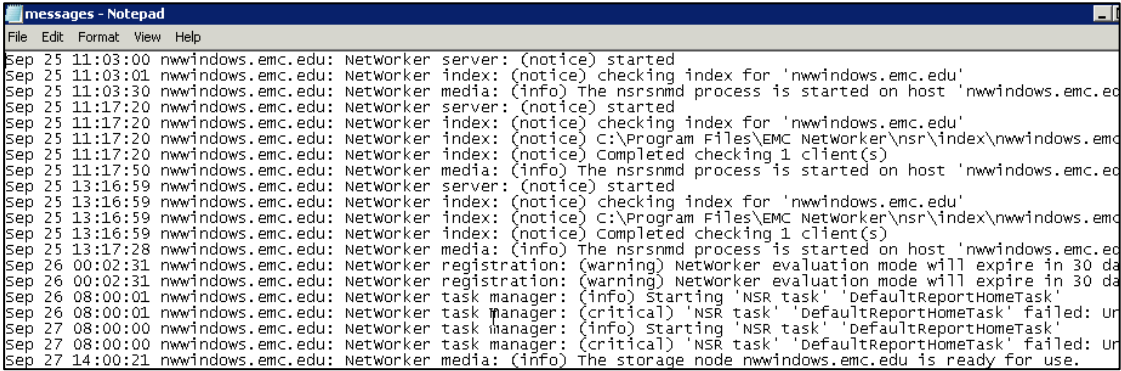
Step	Action
17	<p><b>Right-click</b> the report and <b>export</b> it as an HTML file named <b>report.html</b> in the <b>C:\</b> directory.</p>  <p>Open the <b>report.html</b> file in a web browser.</p> 

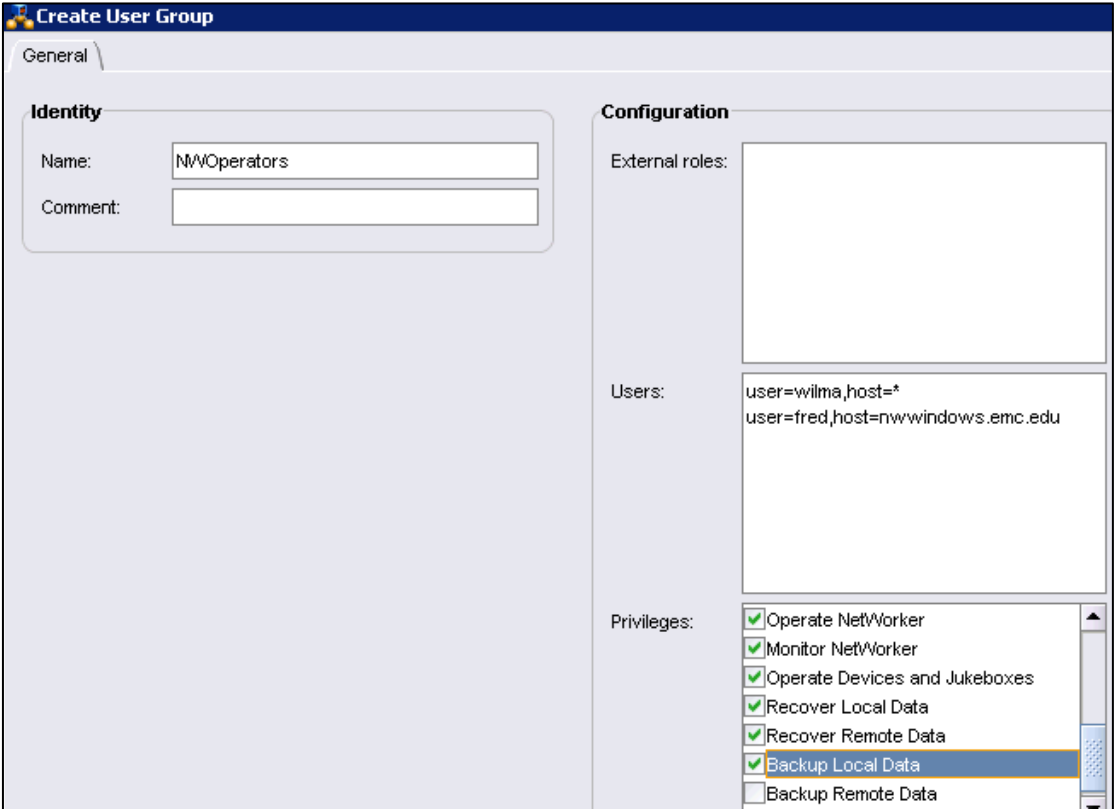
Step	Action
18	<p>Modify the Console database by selecting the <b>Reports</b> pull-down menu and selecting <b>Data Retention</b>.</p>  <p>Modify the <b>Recover Statistics</b> fields with the following options:</p> <p><b>Data Retention</b></p> <p><b>Recover Statistics</b></p> <ul style="list-style-type: none"> <li>• <u>Number of Periods</u>: <b>3</b></li> <li>• <u>Period</u>: <b>Month</b></li> </ul>  <p>Click <b>OK</b>.</p>

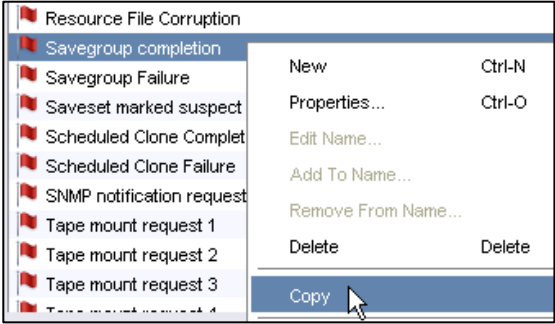
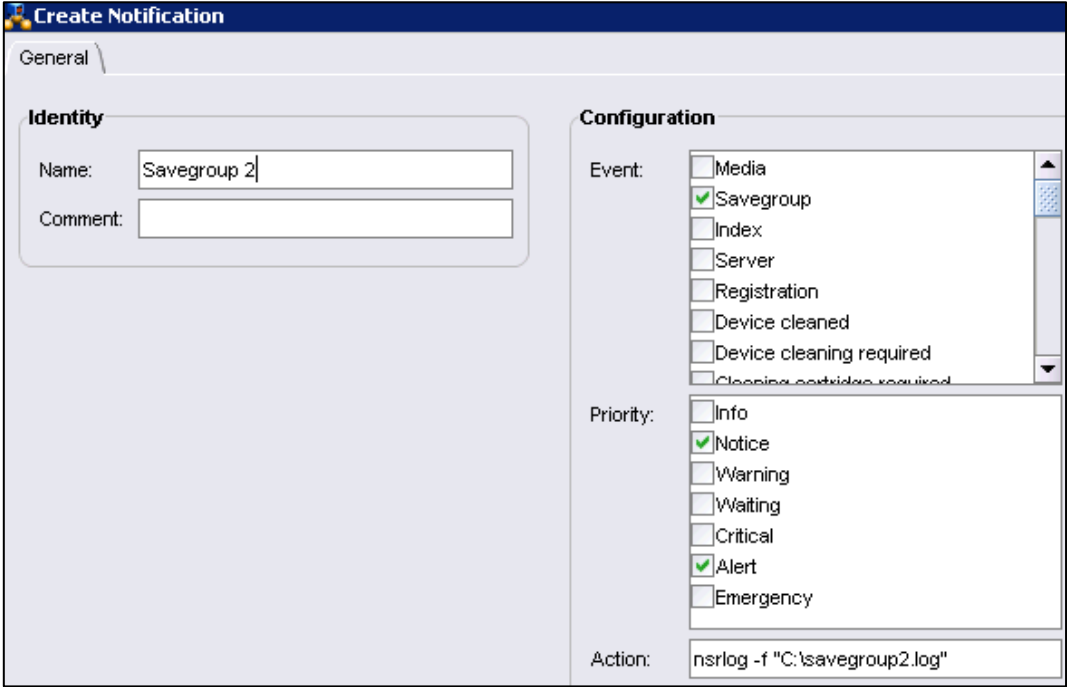
Step	Action
19	<p>From the <b>Configuration</b> tab in <b>NetWorker Administration</b> select <b>Clients</b> and <b>modify</b> the properties of your <b>NetWorker server client</b> that is currently <b>not</b> part of <b>any</b> group.</p> <p><u>Note:</u> The save set for this client should contain NMCASA: If the client selected does not contain this save set select the correct client.</p>  <p><b>Add</b> this client to the <b>11PM</b> Group.</p>  <p>Click <b>OK</b>.</p>
20	<p>From the <b>Monitoring</b> tab, run another backup of the <b>11PM</b> group.</p>
21	<p>View the <b>Details</b> of the <b>11PM</b> group and validate that the console backup completes successfully.</p> 

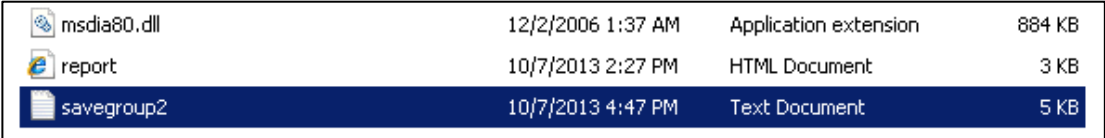
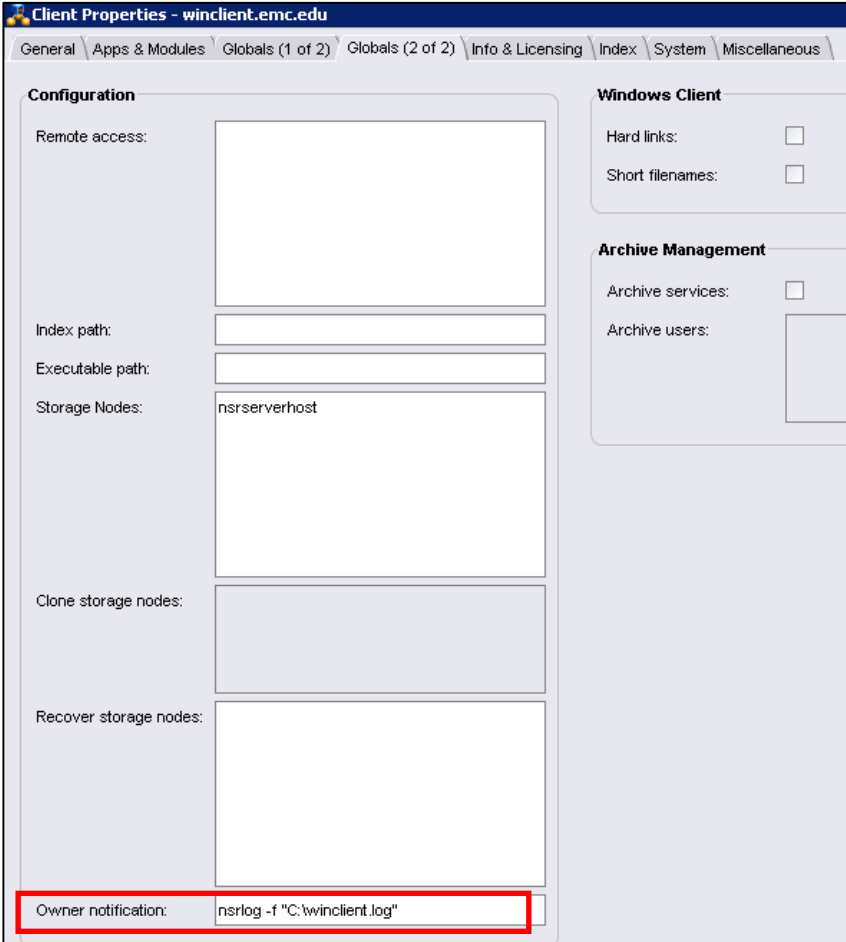
*End of Lab Exercise 11-1*


## Lab Exercise 11-2: Administer the NetWorker Server

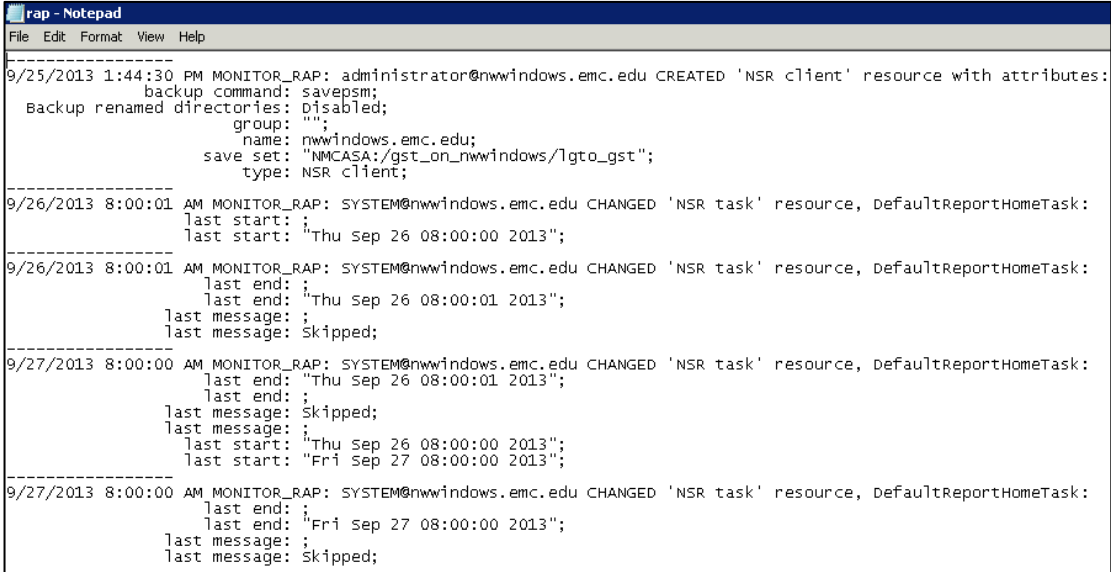
Step	Action
1	<p>On your NetWorker server view the contents of the following NetWorker log files:</p> <ul style="list-style-type: none"> <li>○ <b>messages</b></li> <li>○ <b>summary</b></li> </ul> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;">  </div> <p>If your NetWorker server is on Linux, these log files will be empty as these messages will be logged to syslog or emailed the root user on the system, depending on the particular notification. This behavior varies from Windows based NetWorker servers where these messages are logged in the displayed files.</p>
2	<p>View the contents of the NetWorker <b>daemon.raw</b> log file between yesterday and today. (Adjust the times in order to view some log messages.)</p> <p>First, change to the NetWorker log directory:</p> <ul style="list-style-type: none"> <li>• /nsr/logs (Linux NetWorker server)</li> <li>• C:\Program Files\EMC NetWorker\nsr\logs (Windows NetWorker server)</li> </ul> <pre style="margin: 10px 0;">nsr_render_log -S "month day time" -E "month day time" daemon.raw</pre> <p>For example,</p> <pre style="margin: 10px 0;">nsr_render_log -S "yesterday" -E "today" daemon.raw</pre> <div style="border: 1px solid black; padding: 2px; margin: 10px 0;"> <pre style="font-family: monospace;">c:\Program Files\EMC NetWorker\nsr\logs&gt;nsr_render_log -S "yesterday" -E "today" daemon.raw_</pre> </div>
3	<p>View the last 50 lines of the GST log file, <b>gstd.raw</b></p> <ul style="list-style-type: none"> <li>• <code>cd /opt/lgtonmc/logs</code></li> <li>• <code>nsr_render_log -B -50 gstd.raw</code></li> </ul>

Step	Action
4	<p>From the <b>Configuration</b> tab, select <b>User Groups</b>. In the <b>User Groups</b> window right-click and create a <b>New</b> user group with the following properties:</p> <p><b>Create User Group</b></p> <p><b>General Tab</b></p> <ul style="list-style-type: none"> <li>• <b>Name:</b> NWOperators</li> <li>• <b>Users:</b> user=wilma,host=* user=fred,host=&lt;networker_server_name&gt;</li> <li>• <b>Privileges:</b> Operate NetWorker Monitor NetWorker Operate Devices and Jukeboxes Recover Local data Backup Local data</li> </ul>  <p>Click <b>OK</b>.</p>

Step	Action
5	<p>From the <b>Configuration</b> tab, select <b>Notifications</b>. Make a <b>copy</b> of the <b>Savegroup completion</b> notification.</p>  <p>Enter the following information in the <b>Create Notification</b> window:</p> <p><b>Create Notification</b>  <b>General Tab</b></p> <ul style="list-style-type: none"> <li>• <u>Name:</u> <b>Savegroup 2</b></li> <li>• <u>Action:</u> <b>nsrlog -f "c:\savegroup2.log" (Windows)</b>  <b>/bin/cat &gt;&gt; /tmp/savegroup2.log (Linux)</b></li> </ul>  <p>Click <b>OK</b>.</p>
6	Perform a backup of the <b>11PM</b> group.

Step	Action												
7	<p>When the backup completes, view the contents of the <b>savegroup2.log</b> created by your new notification.</p>  <table border="1" data-bbox="362 300 1461 436"> <tr> <td>msdia80.dll</td> <td>12/2/2006 1:37 AM</td> <td>Application extension</td> <td>884 KB</td> </tr> <tr> <td>report</td> <td>10/7/2013 2:27 PM</td> <td>HTML Document</td> <td>3 KB</td> </tr> <tr> <td>savegroup2</td> <td>10/7/2013 4:47 PM</td> <td>Text Document</td> <td>5 KB</td> </tr> </table>	msdia80.dll	12/2/2006 1:37 AM	Application extension	884 KB	report	10/7/2013 2:27 PM	HTML Document	3 KB	savegroup2	10/7/2013 4:47 PM	Text Document	5 KB
msdia80.dll	12/2/2006 1:37 AM	Application extension	884 KB										
report	10/7/2013 2:27 PM	HTML Document	3 KB										
savegroup2	10/7/2013 4:47 PM	Text Document	5 KB										
8	<p>From the <b>Configuration</b> tab edit the properties of the <b>winclient.emc.edu</b> client in the 11PM group and make the following changes:</p> <p><b>Client Properties – winclient.emc.edu</b>  <b>Globals (2 of 2)</b></p> <ul style="list-style-type: none"> <li><b>Owner notification:</b>  <u>Windows:</u> <code>nsrlog -f "C:\winclient.log"</code>  <u>Linux:</u> <code>/bin/mail -s "Winclient Backed up" root</code></li> </ul> 												
9	Perform a backup of the 11PM group.												

Step	Action
10	<p>Validate that the client notification occurred by checking for the file on the NetWorker server if the NetWorker server is on Windows, or checking the mail on the Linux NetWorker server by typing the command <b>mail</b>.</p> <p><u>Windows</u>: View log file created</p> <div data-bbox="735 371 1086 516" style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">  </div> <p><u>Linux</u>: Type <b>mail</b> and note the message was sent showing backup completion.</p> <div data-bbox="418 625 1403 1199" style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <pre> root@nwlinux:/tmp [root@nwlinux tmp]# mail Mail version 8.1 6/6/93.  Type ? for help. "/var/spool/mail/root": 99 messages 5 new 99 unread U 81 root@nwlinux.emc.edu Wed Oct 9 14:55 24/1178 "nwlinux.emc.edu's Boo" U 82 root@nwlinux.emc.edu Wed Oct 9 14:55 60/4232 "nwlinux.emc.edu's sav" U 83 root@nwlinux.emc.edu Wed Oct 9 14:55 17/837 "Space occupied by ina" U 84 root@nwlinux.emc.edu Wed Oct 9 15:00 17/877 "Space occupied by ina" U 85 root@nwlinux.emc.edu Wed Oct 9 15:01 25/1247 "nwlinux.emc.edu's Boo" U 86 root@nwlinux.emc.edu Wed Oct 9 15:01 17/837 "Space occupied by ina" U 87 root@nwlinux.emc.edu Wed Oct 9 15:01 60/4232 "nwlinux.emc.edu's sav" U 88 root@nwlinux.emc.edu Wed Oct 9 15:06 17/877 "Space occupied by ina" U 89 root@nwlinux.emc.edu Wed Oct 9 15:07 26/1316 "nwlinux.emc.edu's Boo" U 90 root@nwlinux.emc.edu Wed Oct 9 15:07 17/837 "Space occupied by ina" U 91 root@nwlinux.emc.edu Wed Oct 9 15:07 60/4232 "nwlinux.emc.edu's sav" U 92 root@nwlinux.emc.edu Wed Oct 9 15:12 17/877 "Space occupied by ina" U 93 root@nwlinux.emc.edu Wed Oct 9 15:13 60/4232 "nwlinux.emc.edu's sav" U 94 root@nwlinux.emc.edu Wed Oct 9 15:13 38/2360 "Winclient Backed Up" &gt;N 95 root@nwlinux.emc.edu Wed Oct 9 15:16 16/867 "Space occupied by ina" N 96 root@nwlinux.emc.edu Wed Oct 9 15:17 27/1444 "nwlinux.emc.edu's Boo" N 97 root@nwlinux.emc.edu Wed Oct 9 15:17 16/827 "Space occupied by ina" N 98 root@nwlinux.emc.edu Wed Oct 9 15:17 59/4222 "nwlinux.emc.edu's sav" N 99 root@nwlinux.emc.edu Wed Oct 9 15:17 37/2350 "Winclient Backed Up" </pre> </div>

Step	Action
11	<p>From a command prompt or Windows explorer view the contents of the RAP log. Note the entries for the objects created.</p> <p><b>RAP Log Path</b></p> <ul style="list-style-type: none"> <li>• /nsr/logs/rap.log (Linux)</li> <li>• C:\Program Files\EMC NetWorker\nsr\logs\rap.log (Windows)</li> </ul>  <pre> rap - Notepad File Edit Format View Help 9/25/2013 1:44:30 PM MONITOR_RAP: administrator@nwwindows.emc.edu CREATED 'NSR client' resource with attributes:   backup command: savepsm;   Backup renamed directories: Disabled;   group: "";   name: nwwindows.emc.edu;   save set: "NMCASA:/gst_on_nwwindows/lgto_gst";   type: NSR client; ----- 9/26/2013 8:00:01 AM MONITOR_RAP: SYSTEM@nwwindows.emc.edu CHANGED 'NSR task' resource, DefaultReportHomeTask:   last start: ;   last start: "Thu Sep 26 08:00:00 2013"; ----- 9/26/2013 8:00:01 AM MONITOR_RAP: SYSTEM@nwwindows.emc.edu CHANGED 'NSR task' resource, DefaultReportHomeTask:   last end: ;   last end: "Thu Sep 26 08:00:01 2013";   last message: ;   last message: Skipped; ----- 9/27/2013 8:00:00 AM MONITOR_RAP: SYSTEM@nwwindows.emc.edu CHANGED 'NSR task' resource, DefaultReportHomeTask:   last end: ;   last end: "Thu Sep 26 08:00:01 2013";   last message: Skipped;   last message: ;   last start: "Thu Sep 26 08:00:00 2013";   last start: "Fri Sep 27 08:00:00 2013"; ----- 9/27/2013 8:00:00 AM MONITOR_RAP: SYSTEM@nwwindows.emc.edu CHANGED 'NSR task' resource, DefaultReportHomeTask:   last end: ;   last end: "Fri Sep 27 08:00:00 2013";   last message: ;   last message: Skipped; </pre>

*End of Lab Exercise 11-2*

*End of Lab 11*

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## Lab 13: Recover NetWorker Server Control Data

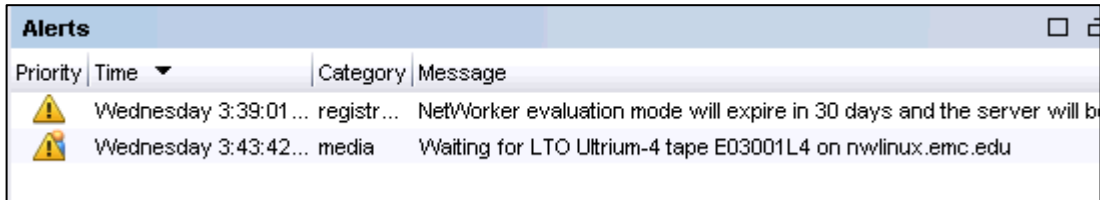
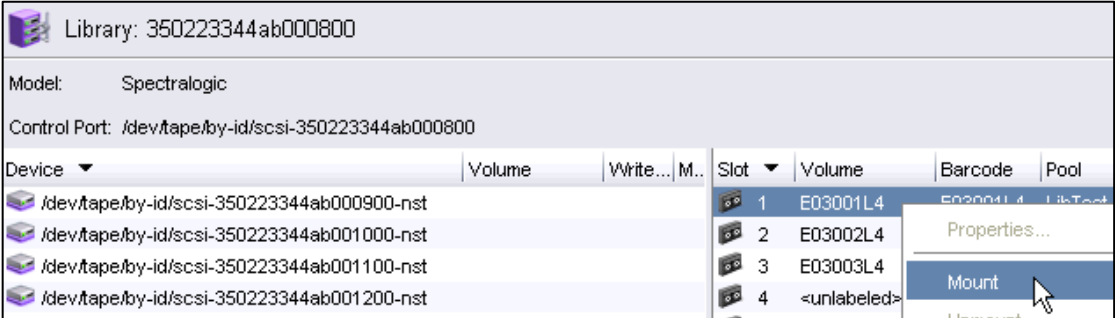
<b>Purpose:</b>	In this lab, you perform a recovery of the NetWorker media and resource databases and a client CFI.
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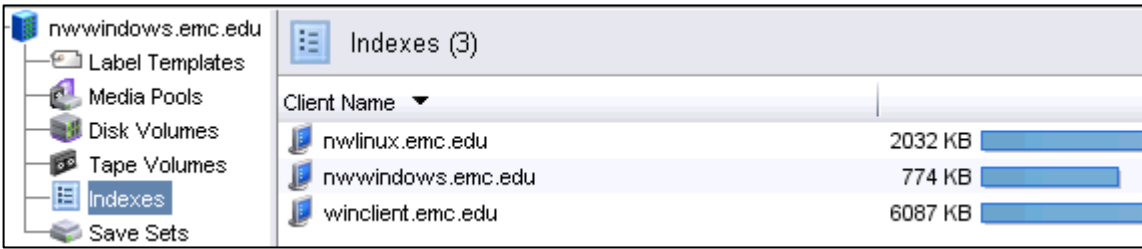
<b>Tasks:</b>	In this lab you: <ul data-bbox="600 567 1185 714" style="list-style-type: none"><li>• Perform a recovery of the bootstrap save set.</li><li>• Perform a recovery of the client file indexes.</li><li>• Verify that the recoveries were successful.</li></ul>
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## Lab Exercise 13-1: Recover the Bootstrap and CFI Save Sets

Step	Action
	<p><b>Simulate a Disaster</b></p>
1	<p>Use the <b>mminfo</b> command to identify the necessary bootstrap information.</p> <pre>mminfo -B</pre> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <pre>[root@nwlinux tmp]# mminfo -B       date      time      level ssid          file  record  volume 10/08/2013 05:03:11 PM    full 4183061260      0      0  Disk1.001 10/08/2013 05:27:32 PM    full 4015290561      0      0  Disk1.001 10/08/2013 05:31:45 PM    full 3897850302      0      0  Disk1.001 10/09/2013 10:02:42 AM    full 3763692031      0      0  Disk1.001 10/09/2013 11:05:07 AM    full 3545591969      8      0  E03002L4 10/09/2013 02:45:11 PM    full 3075843124      0      0  Disk1.001 10/09/2013 02:55:44 PM    full 2958403246      0      0  Disk1.001 10/09/2013 03:01:39 PM    full 2840963088      0      0  Disk1.001 10/09/2013 03:07:05 PM    full 2723522903      0      0  Disk1.001 10/09/2013 03:13:30 PM    full 2606082775      0      0  Disk1.001 10/09/2013 03:17:47 PM    full 2488642521      0      0  Disk1.001</pre> </div> <p>Write down the following information pertaining to the bootstrap save set.</p> <p>SSID: _____</p> <p>Volume Name: _____</p> <p>File Number: _____</p> <p><u>Note</u>: This information is typically obtained from the bootstrap notification via email or log depending on how you have it configured. This lab illustrated an alternative way to retrieve it in case the bootstrap report is not available.</p>
2	<p>Shut down all NetWorker processes on the NetWorker server.</p> <p style="text-align: center;"><b>nsr_shutdown</b> or shut down the <b>NetWorker Remote Exec</b> service</p>
3	<p>Simulate a disaster by renaming the following directories under <b>/nsr</b> or <b>C:\Program Files\EMC NetWorker\nsr</b>:</p> <ul style="list-style-type: none"> <li>• <u>Rename</u>: <b>mm</b> to <b>mm.orig</b></li> <li>• <u>Rename</u>: <b>res</b> to <b>res.orig</b></li> <li>• <u>Rename</u>: <b>index</b> to <b>index.orig</b></li> </ul>

Step	Action										
4	<p>Start the NetWorker and NMC server daemons.</p> <p><u>Start the following services:</u> (Windows)</p> <ul style="list-style-type: none"> <li>• <b>NetWorker Remote Exec Service</b></li> <li>• <b>NetWorker Backup and Recover Server</b></li> <li>• <b>EMC GST Service</b></li> </ul> <p><u>Run the following commands:</u> (Linux)</p> <ul style="list-style-type: none"> <li>• <code>/etc/init.d/networker start</code></li> </ul>										
5	<p>Notice that the directories you renamed were recreated. However, the media database and CFIs are now empty and the resource database contains only the preconfigured resources created during installation.</p> <div data-bbox="542 701 1295 940" data-label="Table"> <table border="1"> <tr> <td>mm</td> <td>10/8/2013 9:36 AM</td> </tr> <tr> <td>mm.orig</td> <td>10/8/2013 9:01 AM</td> </tr> <tr> <td>plugins</td> <td>9/25/2013 11:01 AM</td> </tr> <tr> <td>res</td> <td>10/8/2013 9:36 AM</td> </tr> <tr> <td>res.orig</td> <td>10/8/2013 9:00 AM</td> </tr> </table> </div> <p>Log in to the <b>NetWorker Management Console</b> and validate that your custom configuration is no longer there.</p>	mm	10/8/2013 9:36 AM	mm.orig	10/8/2013 9:01 AM	plugins	9/25/2013 11:01 AM	res	10/8/2013 9:36 AM	res.orig	10/8/2013 9:00 AM
mm	10/8/2013 9:36 AM										
mm.orig	10/8/2013 9:01 AM										
plugins	9/25/2013 11:01 AM										
res	10/8/2013 9:36 AM										
res.orig	10/8/2013 9:00 AM										
	<p><b>Recover the bootstrap save set.</b></p>										
6	<p>From the <b>Devices</b> tab configure the local AFTD device that had the nsrbackup.01 volume mounted in it before the “Disaster”.</p> <p><u>Note:</u> Do <i>not</i> label your AFTD’s as this erases all data on them.</p> <div data-bbox="472 1402 1367 1675" data-label="Image"> </div>										

Step	Action
7	<p>From a command prompt execute <b>nsrdr</b> and respond to the prompts.</p> <pre data-bbox="337 262 1497 409">Using the device: nwlinux_aftd1 to recover the bootstrap Enter the latest bootstrap save set id [0]: 2488642521  Scanning nwlinux_aftd1 for save set 2488642521; this may take a while... █</pre> <p>When prompted to replace the res database select <b>Yes</b>.</p>
8	<p>When prompted to recover client file indexes, select <b>Yes</b> to all clients.</p> <pre data-bbox="337 609 1497 693">The NetWorker server is operational after the disaster recovery completed. Do you want to do client file index recovery? (Clients having indexes for Server nwlinux.emc.edu will be recovered Y(yes)/N(no)? [Y] █</pre> <p>When prompted if you are sure you want to continue, type <b>Y</b>.</p> <pre data-bbox="337 798 1497 955">You have selected the option to recover the client file indexes for all configur ed clients. This process is lengthy and will overwrite current client file inde x entries for all the clients  Do you want to continue? Y(yes)/N(no)? [N] Y█</pre> <p>While this is running, log in to the NetWorker Management Console and look for any alerts.</p> 
9	<p>If an alert is pending requesting a tape to be mounted, mount the tape.</p> 

Step	Action										
10	<p>Monitor the <b>nsrdr</b> recovery and validate that it completes successfully.</p> <pre data-bbox="324 262 1510 588"> Waiting for client file Index recovery to complete.It may take some time Recover start time: Wed 09 Oct 2013 03:43:42 PM EDT Recover start time: Wed 09 Oct 2013 03:43:42 PM EDT Recover completion time: Wed 09 Oct 2013 03:43:42 PM EDT Recover completion time: Wed 09 Oct 2013 03:43:42 PM EDT Recover start time: Wed 09 Oct 2013 03:53:43 PM EDT Recover completion time: Wed 09 Oct 2013 03:53:43 PM EDT The client file index recovery completed. You have new mail in /var/spool/mail/root [root@nwlinux nsr]# █ </pre>										
11	<p>From the <b>Media</b> tab of the <b>NetWorker Administration GUI</b> select <b>Indexes</b> and note that the client file indexes have been rebuilt.</p>  <table border="1" data-bbox="349 751 1485 997"> <thead> <tr> <th colspan="2">Indexes (3)</th> </tr> <tr> <th>Client Name</th> <th></th> </tr> </thead> <tbody> <tr> <td>nwlinux.emc.edu</td> <td>2032 KB</td> </tr> <tr> <td>nwwindows.emc.edu</td> <td>774 KB</td> </tr> <tr> <td>winclient.emc.edu</td> <td>6087 KB</td> </tr> </tbody> </table>	Indexes (3)		Client Name		nwlinux.emc.edu	2032 KB	nwwindows.emc.edu	774 KB	winclient.emc.edu	6087 KB
Indexes (3)											
Client Name											
nwlinux.emc.edu	2032 KB										
nwwindows.emc.edu	774 KB										
winclient.emc.edu	6087 KB										

*End of Lab Exercise 13-1*

*End of Lab 13*

*End of Labs for EMC NetWorker Installation, Configuration and Administration*