Implementing HP Storage Software Solutions

ESG10976LG0308

**lab
guide**

**Implementing HP
Storage Software
Solutions**

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→

training

Implementing HP Storage Software Solutions
Lab Guide
August 2003

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HP OpenView Storage Virtual Replicator

Lab 2.1

Objectives

After completing this lab, students should be able:

- Install, configure and use HP OpenView Storage Virtual Replicator with Microsoft Windows 2000

Introduction

The instructions in this lab guide take you through all the steps necessary to install, configure, and use HP OpenView Storage Virtual Replicator with Microsoft Windows 2000. You will find additional information in the *Storage Virtual Replicator System Administrator's Guide*.

Hardware

The following hardware is required for each group of students performing this lab:

- One system configured as follows:

  - An Intel-architecture, 32 bit processor

  - Memory: 128MB required (256MB recommended)

  - Disk space: 100MB required for full Storage Virtual Replicator installation

  - Storage:

    - **Internal** — Four disk drives (one system disk, three unformatted drives). Three drives installed in the storage cabinet, one left out.

    Or

    - **External** — Four units (unformatted). LUNs created for three drives, one unassigned.

Preinstalled software

The following software must be pre-installed:

- Microsoft Windows 2000, Professional, Server, or Advanced Server SP2 or greater for all versions.

- Microsoft Internet Explorer 5.01 or greater

Software installed during the lab

- Storage Virtual Replicator

- HP Storage License Manager

Location of software and account names

Your instructor will provide any additional information during the lab.

Storage Virtual Replicator lab overview

Each section of the lab contains multiple exercises.

▲ **Note**
The exercises in this lab use a GUI to execute Storage Virtual Replicator tasks. To schedule a snapshot creation that will be used for backup, you can also use the Storage Virtual Replicator command line interface SnapMgr in a batch and Windows Scheduler to schedule the execution of the batch.

Section 1 – Pools, virtual disks

You will begin this section by installing the Storage Virtual Replicator software. Then you will create pools and virtual disks using both the MMC and the command line interface. You will also import existing disks into the pool.

Section 2 – Online volume growth (optional)

In this section, you will learn about the new online volume growth feature of Storage Virtual Replicator for Windows 2000. You will expand a virtual disk dynamically while applications and data remain accessible.

Section 3 – Deleting virtual disks, snapshot, and pools

In this section, you will learn the proper procedure for removing snapshots, virtual disks, and pools.

Section 1 - Pools, virtual disks, snapshots

Overview

There are four exercises in this section:

- Exercise 1: Installing Storage Virtual Replicator
- Exercise 2: Installing the HP Storage License Manager
- Exercise 3: Creating pools
- Exercise 4: Creating virtual disks
- Exercise 5: Creating snapshots.
- Exercise 6: Import an existing disk

Exercise 1: Installing Storage Virtual Replicator

In this exercise you will install the Storage Virtual Replicator server software on one of the Windows 2000 servers in your classroom lab.

3. Start Windows 2000 and log on under a domain account that has administrator permissions. Username: Administrator Password: [ ]

4. Using disk manager, verify that all storage intended for inclusion in the Storage Virtual Replicator pool is unformatted, not partitioned, and is a Basic (not Dynamic) disk.

5. Insert the product CD. If the Autorun is not invoked, browse to the CD-ROM drive and click *Setup.exe*.

> ▲ **Note**
> If your instructor has the Storage Virtual Replicator software available on a network share, the instructor will provide you with drive mapping instructions.
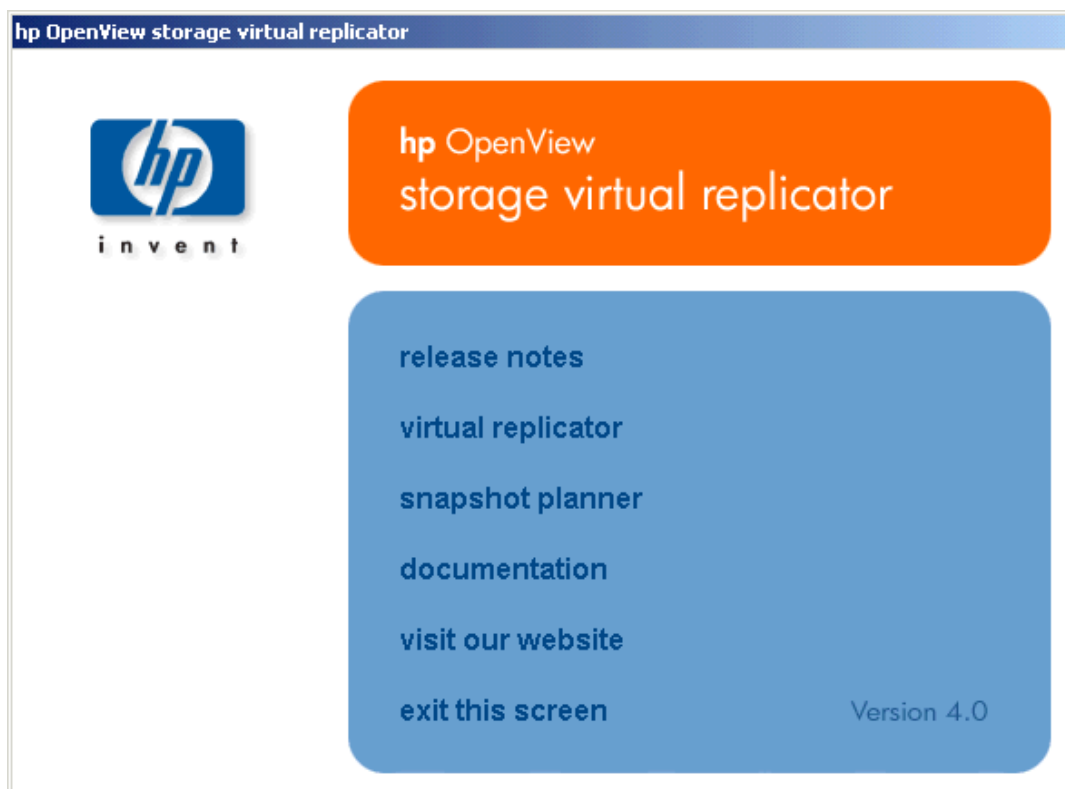
6. When the Storage Virtual Replicator splash screen displays, click *virtual replicator*.
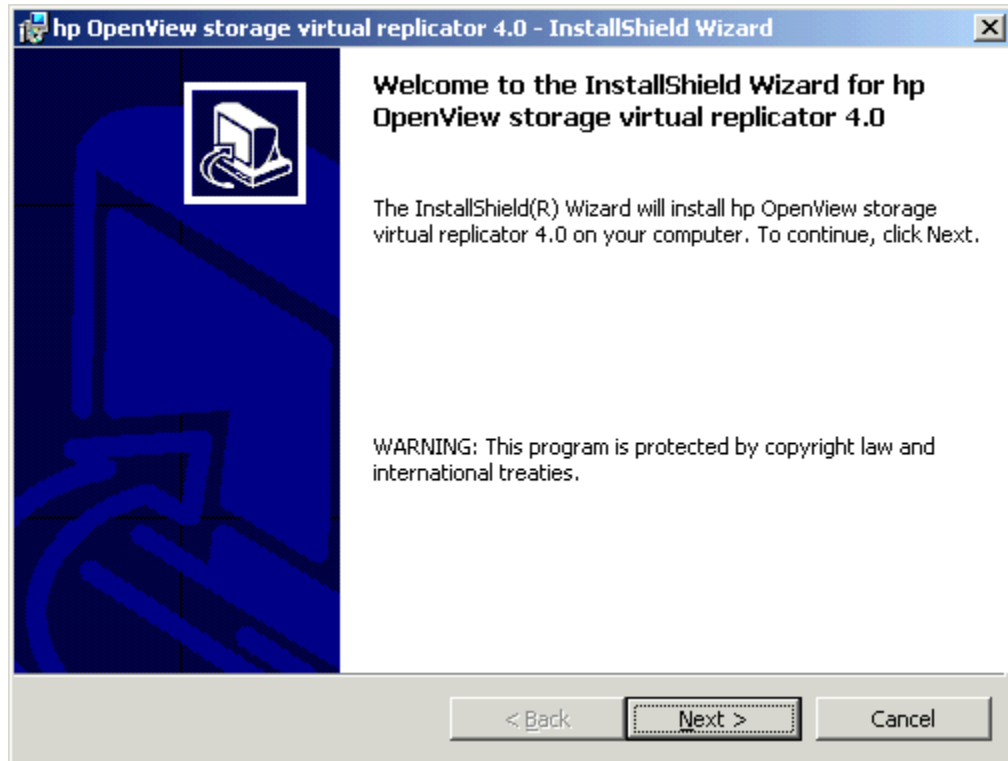
7.   The *InstallShield Wizard* is launched. Click *Next* to advance.

8.   Accept the license terms then click *Next*.
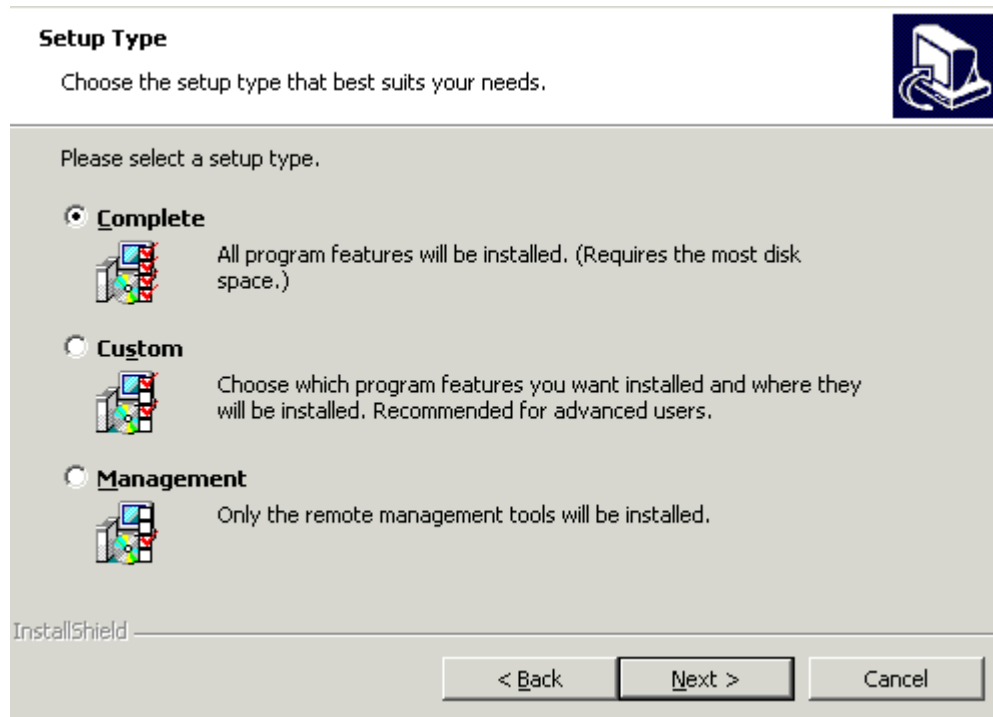
9.   At the *Setup Type* screen, select *Complete* and click *Next*.

10. Check with your instructor to see if a license server has already been set up.

11. If the license server has been set up, get the host name or IP address from your instructor and select *Connect to an existing license server*.

License Server Location

If you already have a License Server, enter the name of the computer that is running the license server, or install it on this system.

◉ Use this computer as a license server

○ Connect to an existing license server

InstallShield

< Back | Next > | Cancel
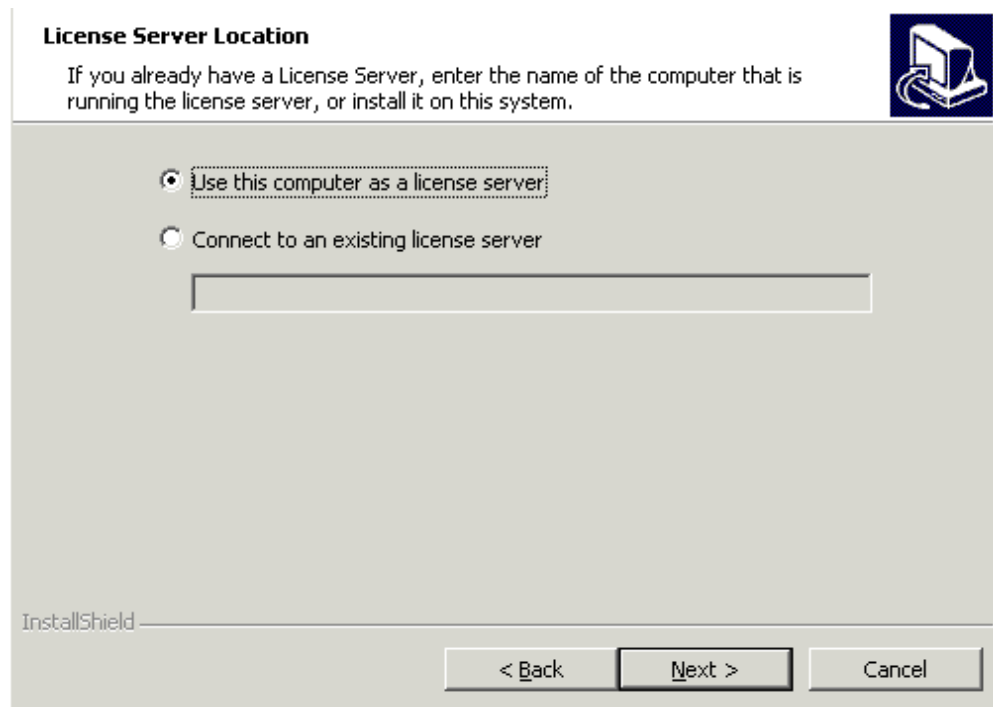
12. If no license server has been set up, ensure that *Use this computer as a license server* is selected.

13. Click *Next*.
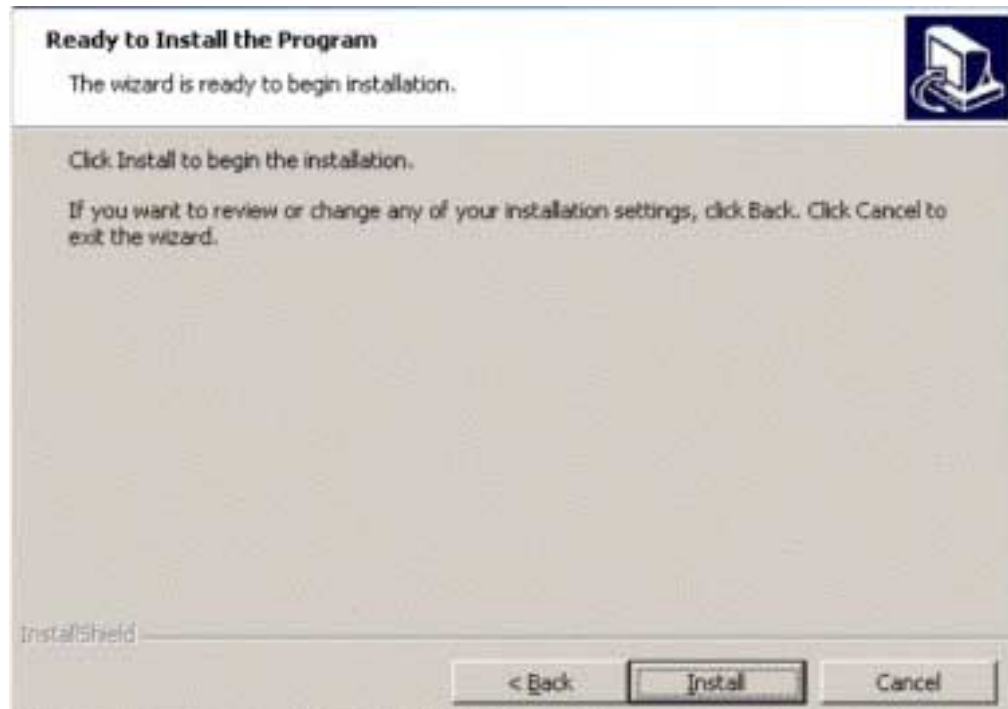
14. Click *Install.* The installation program begins copying files.

15. When the InstallShield Wizard Completed window displays click *Finish*.
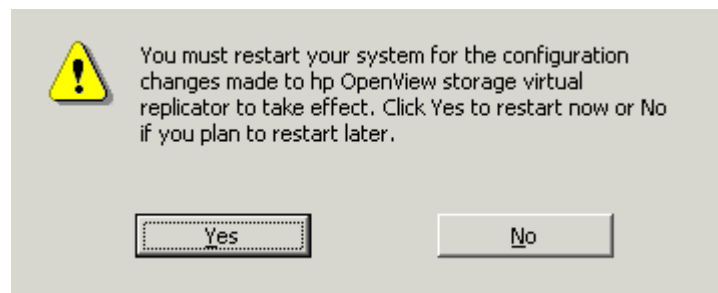
16. Remove the CD and click *Yes,* to restart your computer.

17. Your system will shutdown and restart.

18. Go to *Settings → Control Panel → Administrative Tools → Services*.

19. What is the status of the *Virtual Replicator Management Service? Virtual Replicator Lifeguard Service*? If they are not started, try to start manually. If unable, uninstall and reinstall SVR.

    ....

20. Close the services window.

Exercise 2: Setting up Storage Virtual Replicator licensing

> **!**
>
> **Important**
>
> Check with your instructor to see if a license server has already been set up for Storage Virtual Replicator. If it has, skip this exercise and continue with Exercise 3.

Before you can use the Storage Virtual Replicator software on one or more systems, you need to have a valid license. To acquire the license, follow the instructions on the License Key Retrieval Instruction Sheet included with the Storage Virtual Replicator product.

The purpose of this exercise is to setup a Storage Software Storage License Manager and enter the Storage Virtual Replicator license information, which controls the number of Storage Virtual Replicator licenses.

1.   Obtain the license information from your instructor.

2.   Select *Start → Programs → SANworks Storage License Manager → Storage License Manager* to bring up the HP Web-Based Management Account Login screen in your web browser.

> **Note**
>
> If the license server was already installed on another computer, you would replace *localhost* in the web address with the hostname or IP address of the other computer.

21. Type *administrator* as the name and password. Click *OK*.

    What is the License Manager state?

    ....
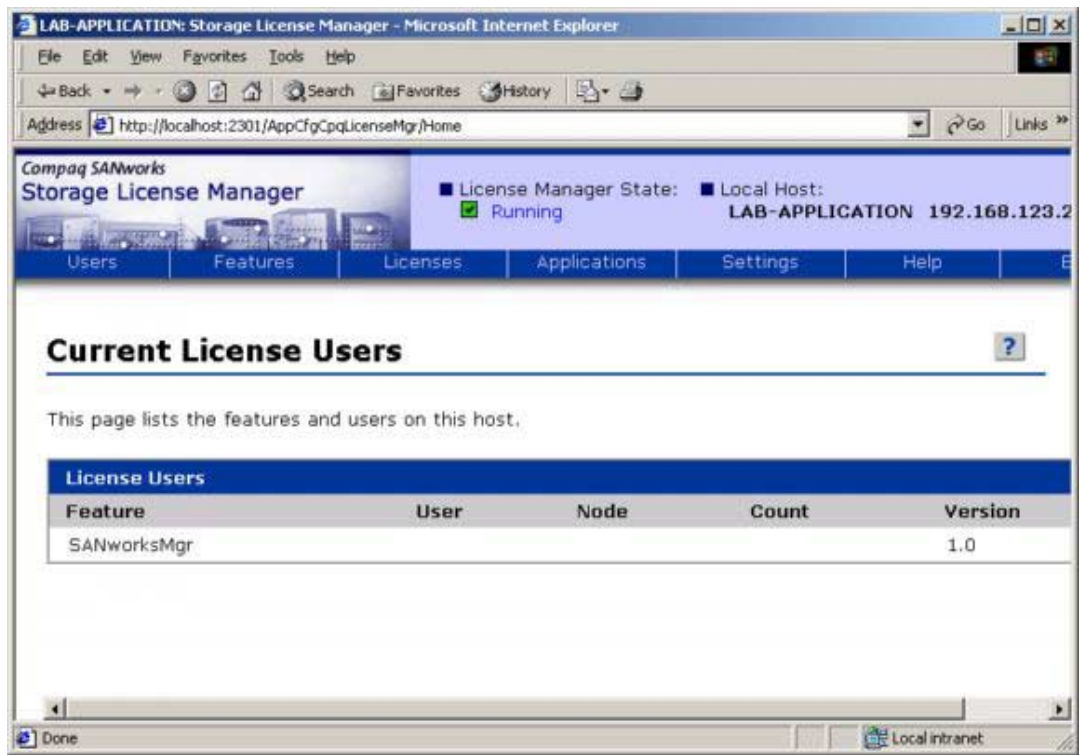
List the options available when you select:

Users: ....

Features: ....

Applications: ....

Settings: ....

4. Click *Licenses* on the License Manager menu bar.
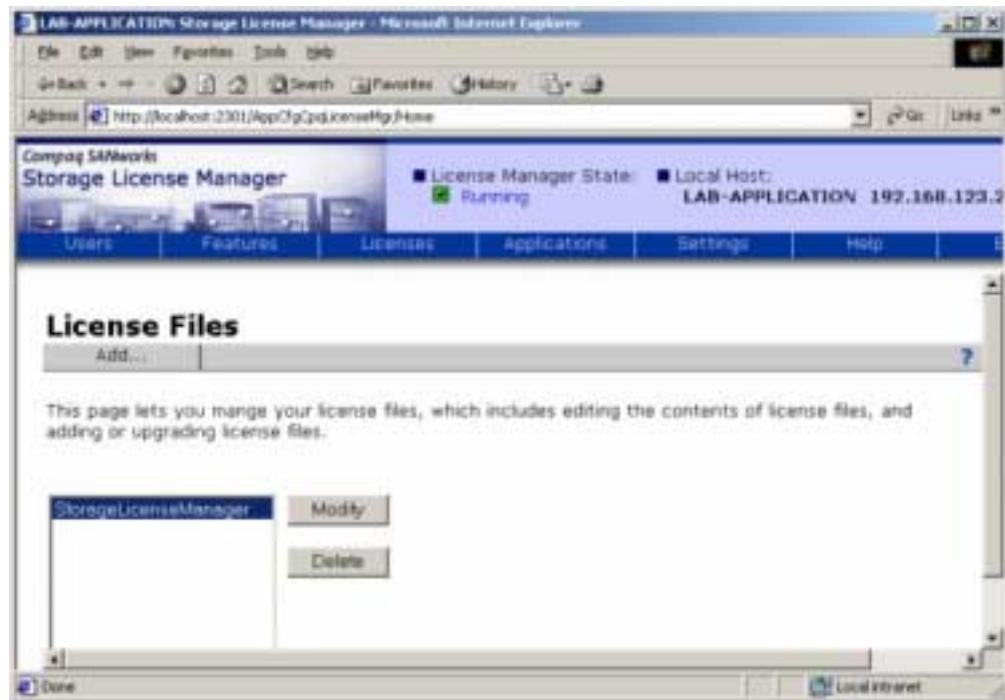
5.   Click *Add* to enter the Storage Virtual Replicator license information.
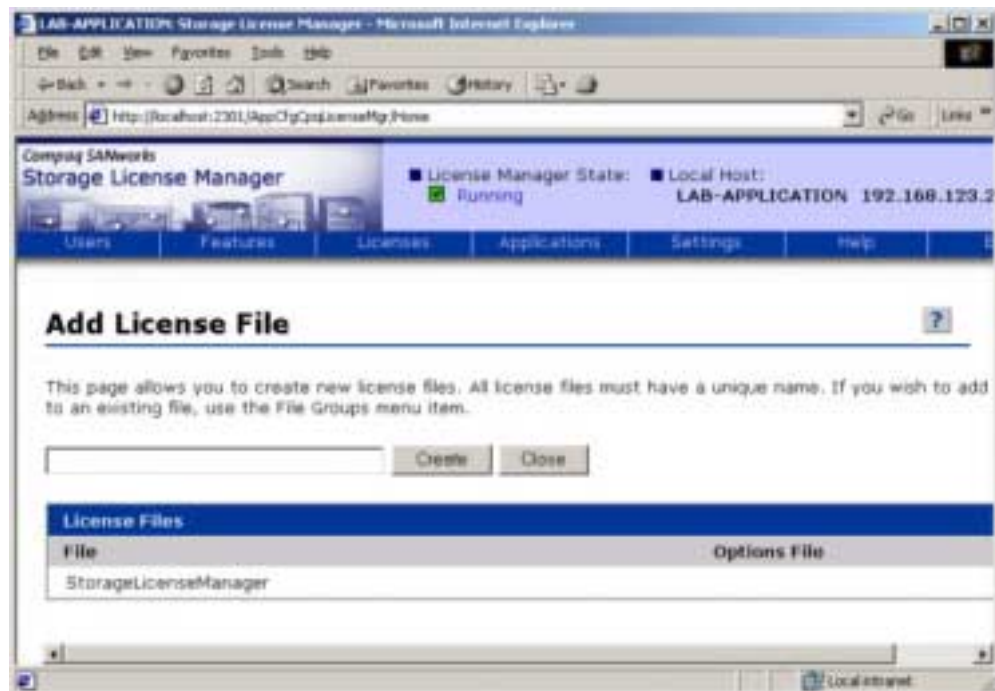
6.   Enter *SVRLicense* as the license file name, click *Create*.

7.   Click *Close.*

8.   Select *SVRLicense* from license files and click *Modify*.

9.   Scroll down the page (or maximize the window) to contents of license file.

> **!** **Important**
>
> Since there are imbedded characters in the license information, you must cut and paste the license into the license manager to ensure that you have a recognized license. Use plain text to retrieve and copy the license key from email.

10.   Open the license file provided by your instructor, copy the contents of the file, and paste them in the *Contents of License File* window.

      Where do you get the information on obtaining a license key?

      ....

11.   Click *Save*.
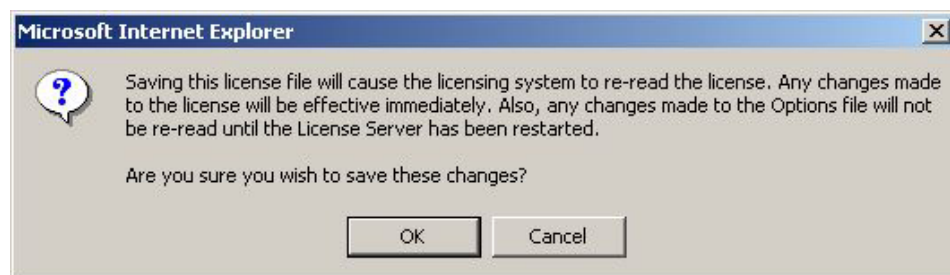
12.   Click *OK* when requested.

13.   Click *Exit* on the menu bar.

Exercise 3: Creating pools

With Storage Virtual Replicator hardware array storage or physical disks are grouped into a logically concatenated pool of disk space. You can create any number of pools and any storage to which Windows has direct access can be used in a pool. In addition to standard single disks, you can use controller-based, fault-tolerant disk arrays, referred to as **storage unit**s.

The purpose of this exercise is to create a storage pool.

1. Start Storage Virtual Replicator by selecting *Start → Programs → hp OpenView storage virtual replicator → Replication Manager.*
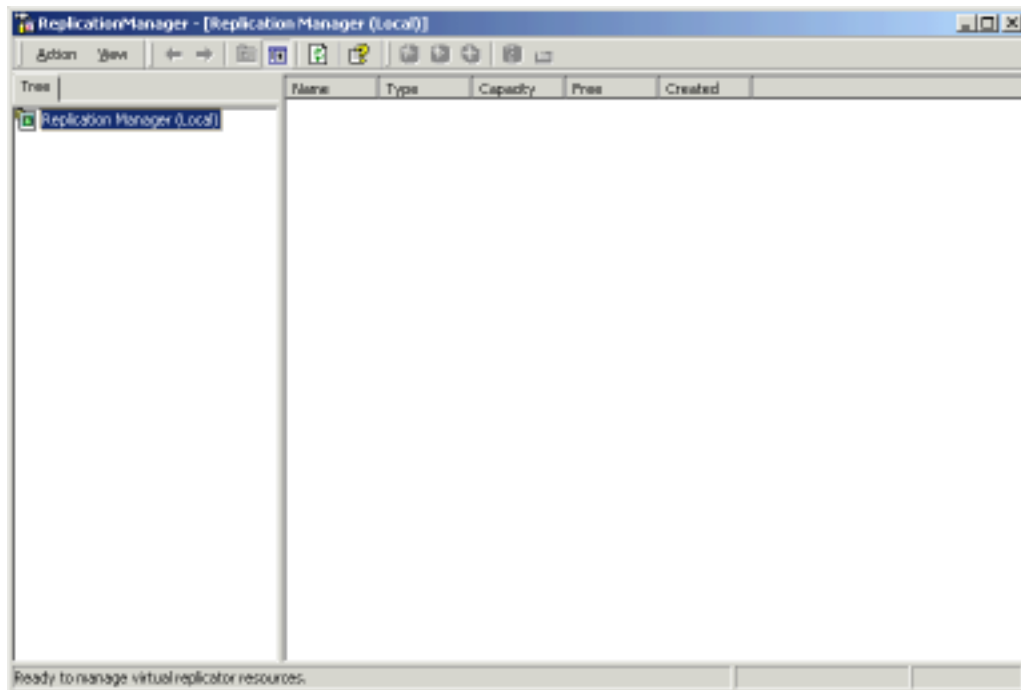
2. Right-click *Replication Manager (Local)* then select *New → Pool*.

3. Click *Next* after the new pool wizard displays.

   The new pool wizard displays a pane containing a list of storage units, which are available for pool creation.
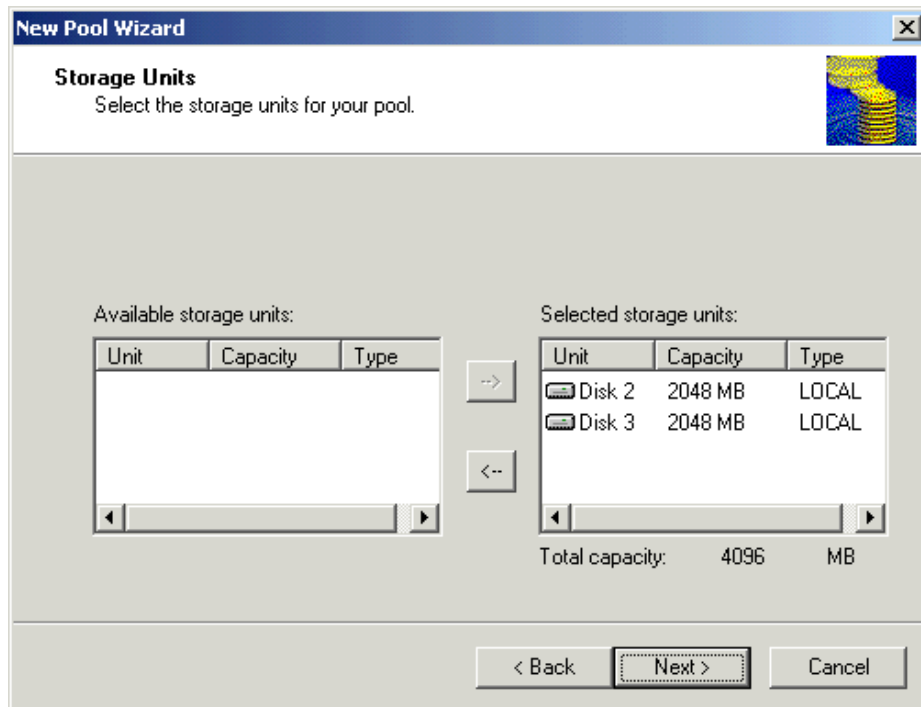
4. Select one of these storage units and click the → *arrow*. Repeat this for one other storage unit. Click *Next*. The Pool naming window displays.

In the screen shot above, which storage units will be used in creating the pool?

....

5.   Name this pool *Pool1*.

6.   In the *segment size* drop-down box, click on each of the available options; note the corresponding *maximum disk size.* A segment unit of disk space used in virtual disk allocation and snapshot copy-out operations.

   What are the available options for *Segment size*?

   ....

   What is the maximum disk size if 256KB is used for the segment size?

   ....

7.   Select 128KB as the segment size, and click *Next*.

8.   After the pool wizard displays, click *Finish*.
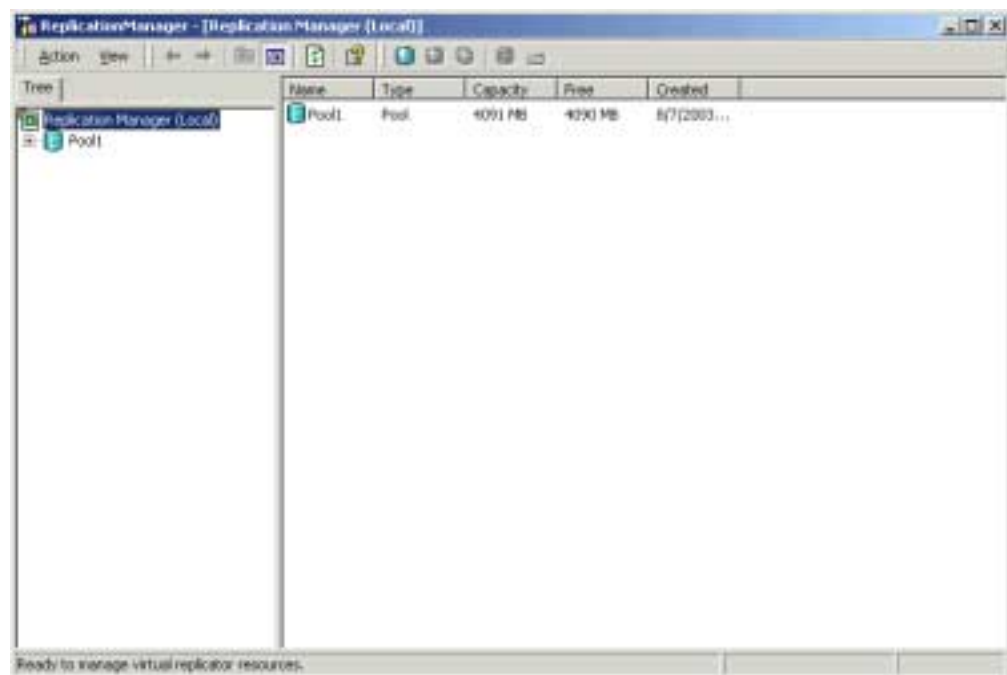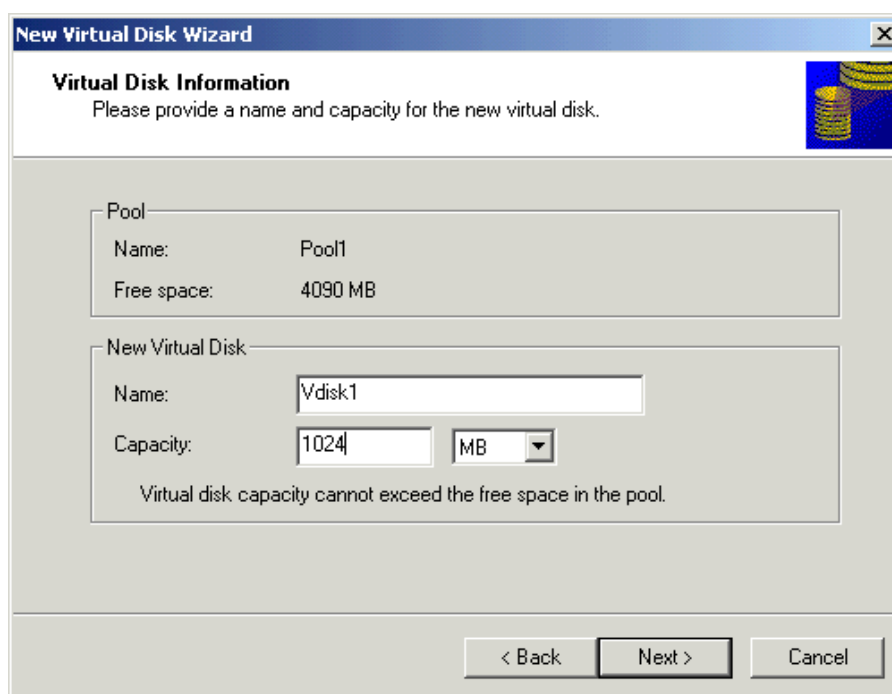
On the MMC display note that the newly created pool is listed in the right-hand window.

Exercise 4: Creating virtual disks

The virtual disks that you create in the pool perform and behave in exactly the same way as physical disks. That is, you can format and map drive letters to them just like physical disks. In addition, you can install applications to a virtual disk, including cluster-aware applications, such as Microsoft Exchange.

The purpose of this exercise is to create virtual disks.

1. Open Replication Manager.

2. Right-click *Pool1*.

3. Select *New → Virtual disk.*

4. When the new virtual disk wizard displays, click *Next*.

5. On the virtual disk information screen, enter the new virtual disk name as *Vdisk1*.

6. Enter a capacity value of *1024MB (1GB)*.

7. Click *Next*.

   The name you select can be up to 23 characters long. Choose a name that is different from any pool or virtual disk on the stand-alone computer or cluster that you will be managing.
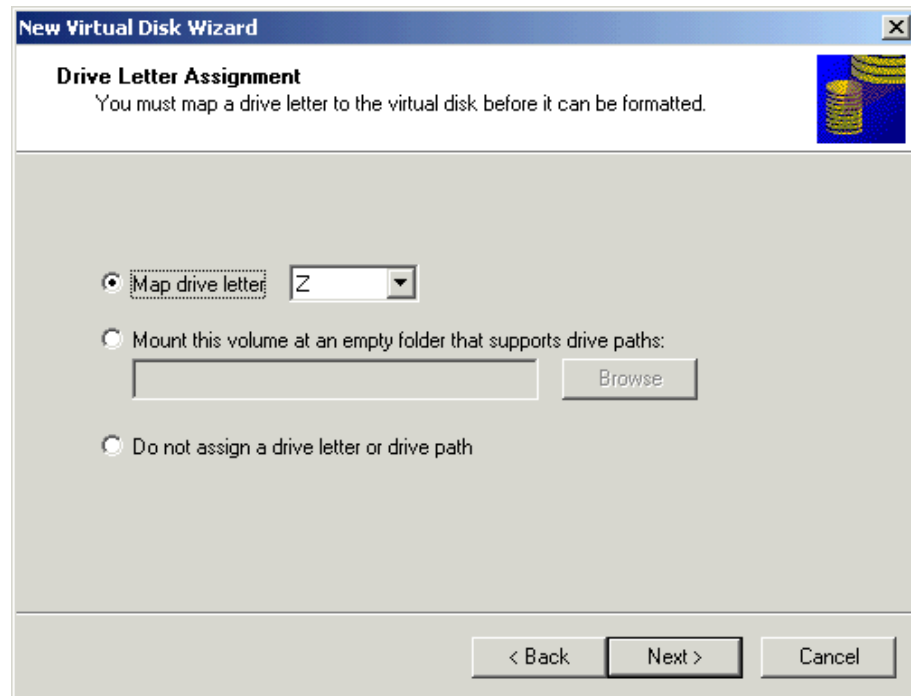
8. The drive letter assignment window displays. Assign the drive letter as *Z* and click *Next*.

What would be a reason for not assigning a drive letter at this time?

....

....
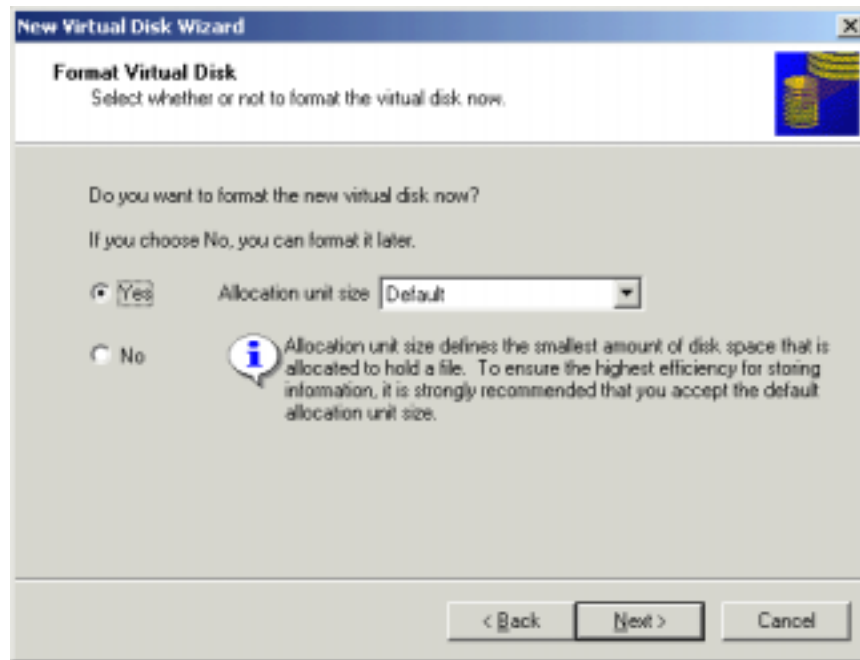
9. Ensure that *Yes* is selected on the format virtual disk window.

10. Accept the default *Allocation unit size*.

    What is the default allocation unit size? ....

    What is the reason, other than the one listed above, that you should select the default allocation size?

    ....

    ....

    (Hint: From the *Storage Virtual Replicator System Administrator's Guide*, you cannot defragment a virtual disk if the allocation size is greater than 4096)

11. Click *Next*.
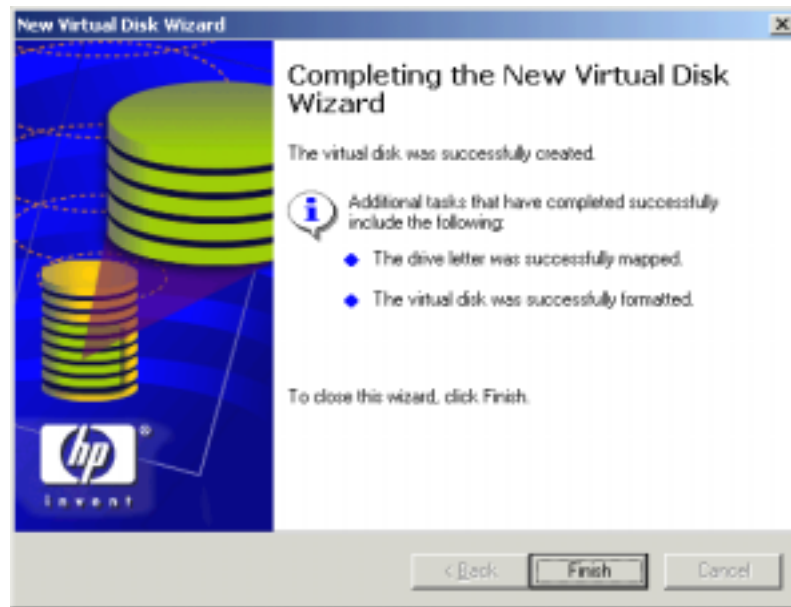
12. Click *Finish.*

13. Click on *Pool1* and verify that the virtual disk that you created is listed under the pool and in the right hand window.
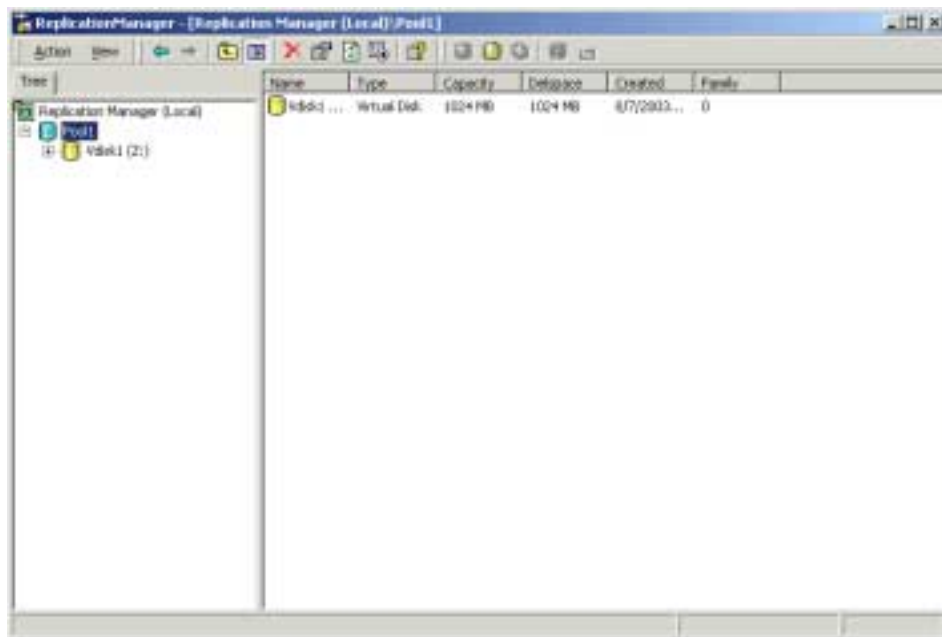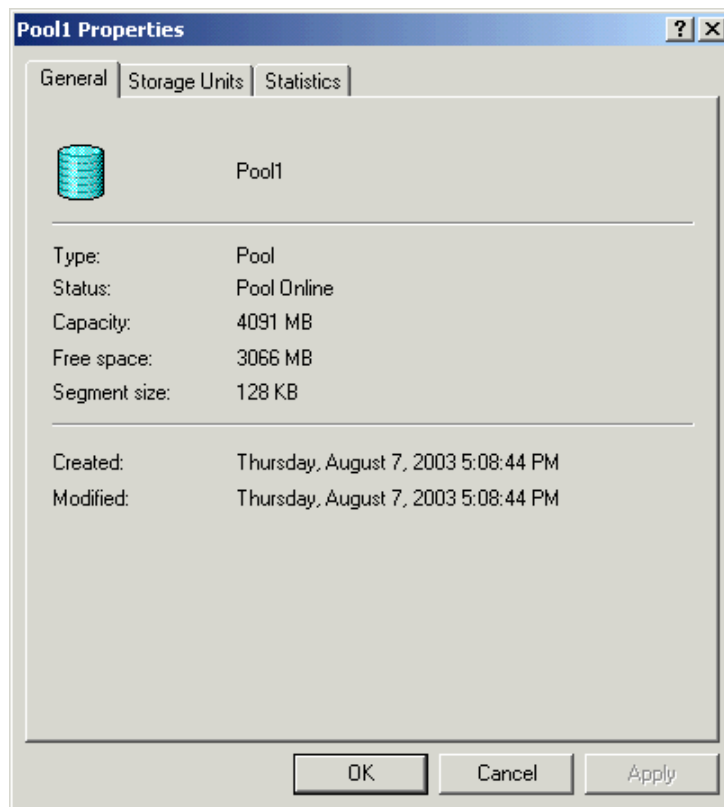
14. Right-click *Pool1* and select *Properties*

    What storage units are included in the pool?

    ....

    What are the statistics for read and write operations?

    ....

    ....

    ....

15. Examine the information on each tab. Click *OK* when you are finished.
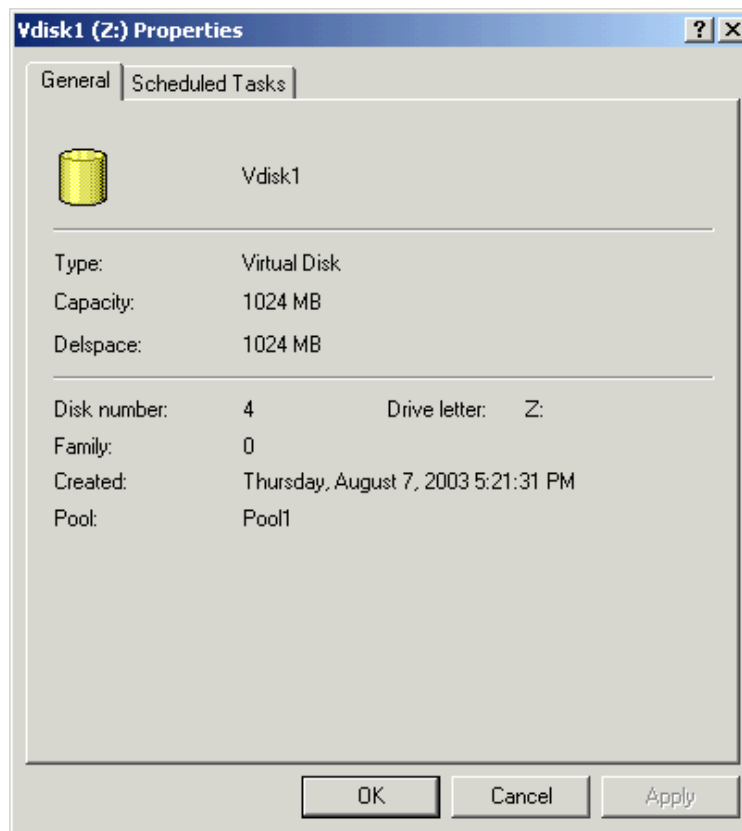
16. Right-click *Vdisk1* and select *Properties*.

17. Examine the information on each tab. Click *OK* when you are finished.

18. Minimize the MMC.
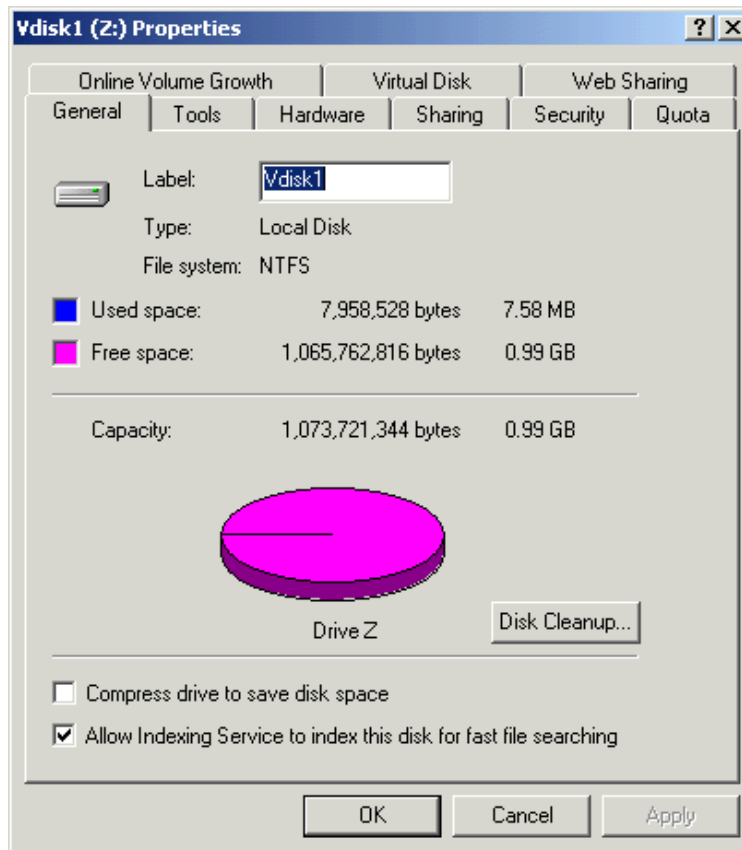
19. Using Windows Explorer (or My Computer), right-click *Vdisk1* and select *Properties* to examine its properties (general, tools, hardware, quota, sharing, and security).

   Note that it has the same attributes as a physical disk. Also note the additional tabs:

   Virtual disk tab — provides information specific to the virtual disk.

   Online volume growth tab — allows you to dynamically expand the size of the virtual disk. Do **not** grow the volume at this time.

20. Click *OK* when you are finished.

Exercise 5: Creating snapshots
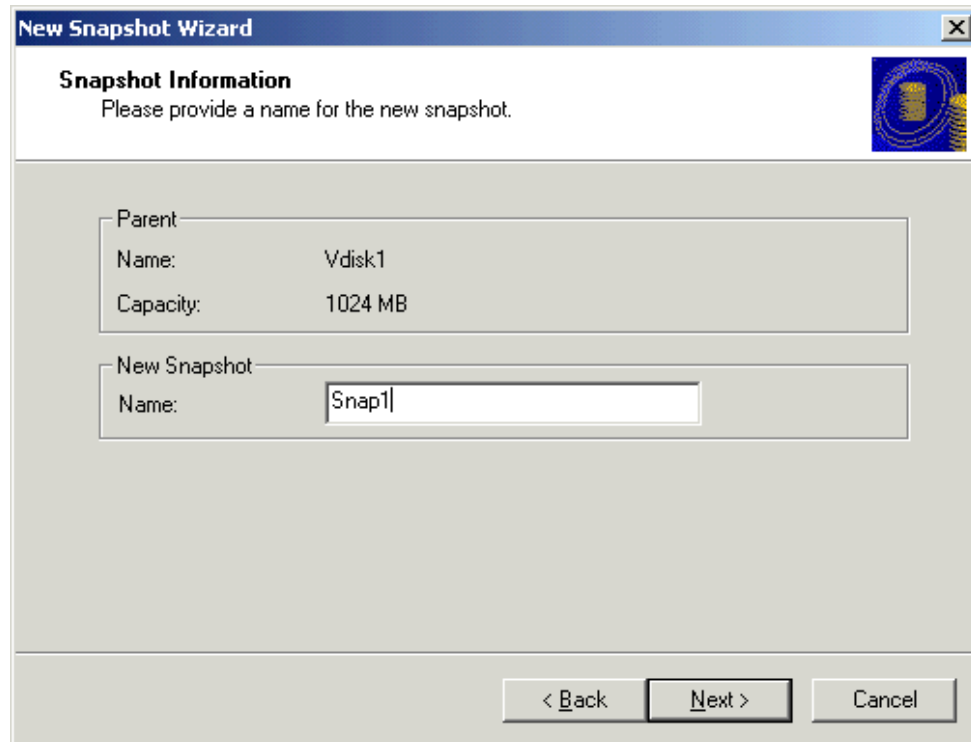
Storage Virtual Replicator lets you make instant replicas (called snapshots) of virtual disks in a matter of seconds. Snapshots enable the instant creation of multipurpose virtual replicas of production data without having to physically copy the data. These snapshots can be used for backups, data mining or data warehousing applications, migration test, and so on.

The purpose of this exercise is to create snapshots.

1. Using Windows Explorer, copy files (for example the program files directory) from the local drive C to the virtual disk Vdisk1.

2. Open Replication Manager.

3. Select *Pool1* then right-click *Vdisk1*.

4. Select *New → Snapshot*.

5. After the new snapshot wizard displays, click *Next*.

6. Enter *Snap1* as new snapshot name.

7. Click *Next*.
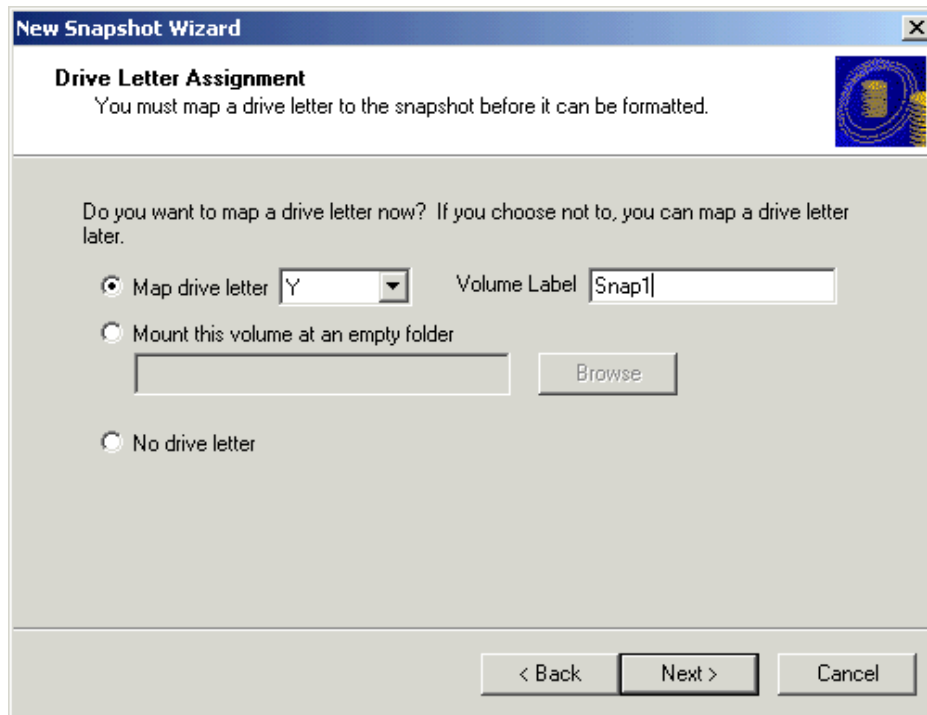
8. On the Drive Letter Assignment screen, click *Map Drive Letter*. Select a drive letter from the drop-down list.

   Why would you choose not to map a drive letter to the snapshot at this time?

   ....

   ....

9. Change the volume label to *Snap1*. (It defaults to the volume label of the parent disk), click *Next*.

   How long did it take to create the snapshot?

   ....

10. When the completion window displays, click *Finish.*
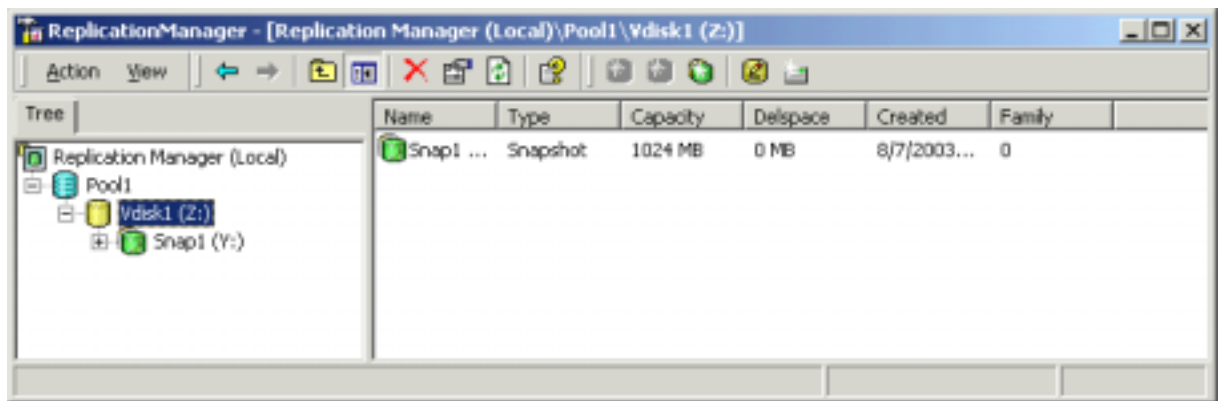
11. Using MMC, click the virtual disk used to create the snapshot and verify that the snapshot displays under the parent virtual disk and in the right hand window.

    What is the Delspace for the snapshot?

    ....

12. Select *Pool1* and in the right hand window determine the Delspace for Vdisk1.

    ....
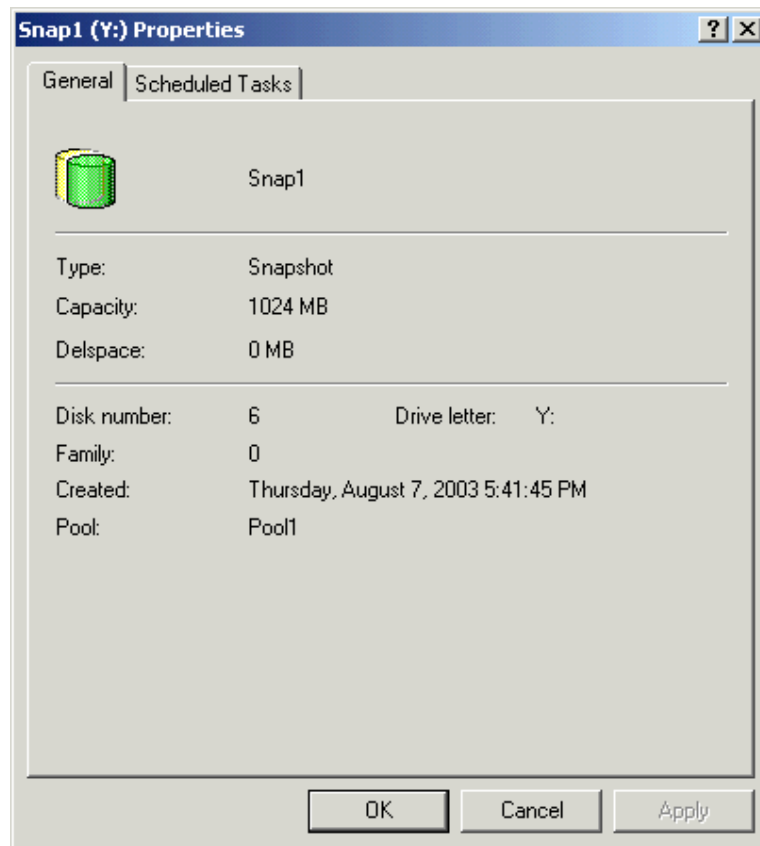
13. Right-click Snap1 and then select *Properties.*

    What is the drive letter of the Snap1?

    ....

14. Click *OK* when you are finished.

15. Use Windows Explorer (or My Computer) to examine the snapshots that you created.
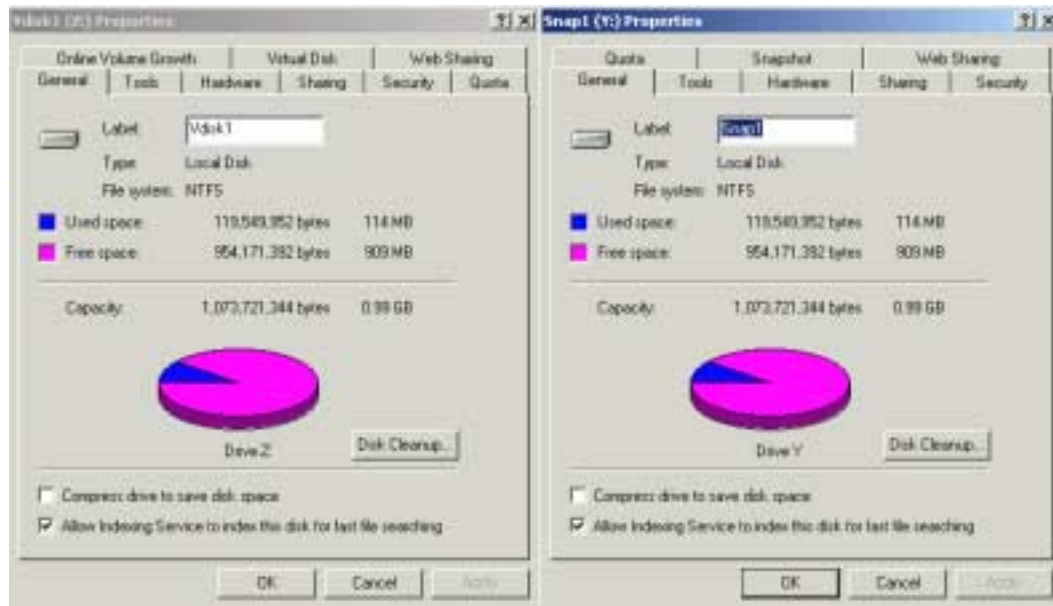
16. Verify that *Vdisk1* is identical to *Snap1*.

    How many objects are on Snap1? Vdisk1?

    ....

17. Using Windows Explorer (or My Computer), select several objects from *Vdisk1*, note their names, and then delete them.

18. Using MMC, select *Vdisk1*.

    What is the delspace for snap1?

    ....

19. Using Windows Explorer (or My Computer), search for the names of the deleted objects on *Snap1*.

    Were the files found?

    ....

20. Copy the deleted objects from *Snap1* back to *Vdisk1*.

Exercise 6: Import an existing disk

The purpose of this exercise is to grow a virtual disk, while the data remains online and accessible. You will use the third storage unit that is presented to this host.
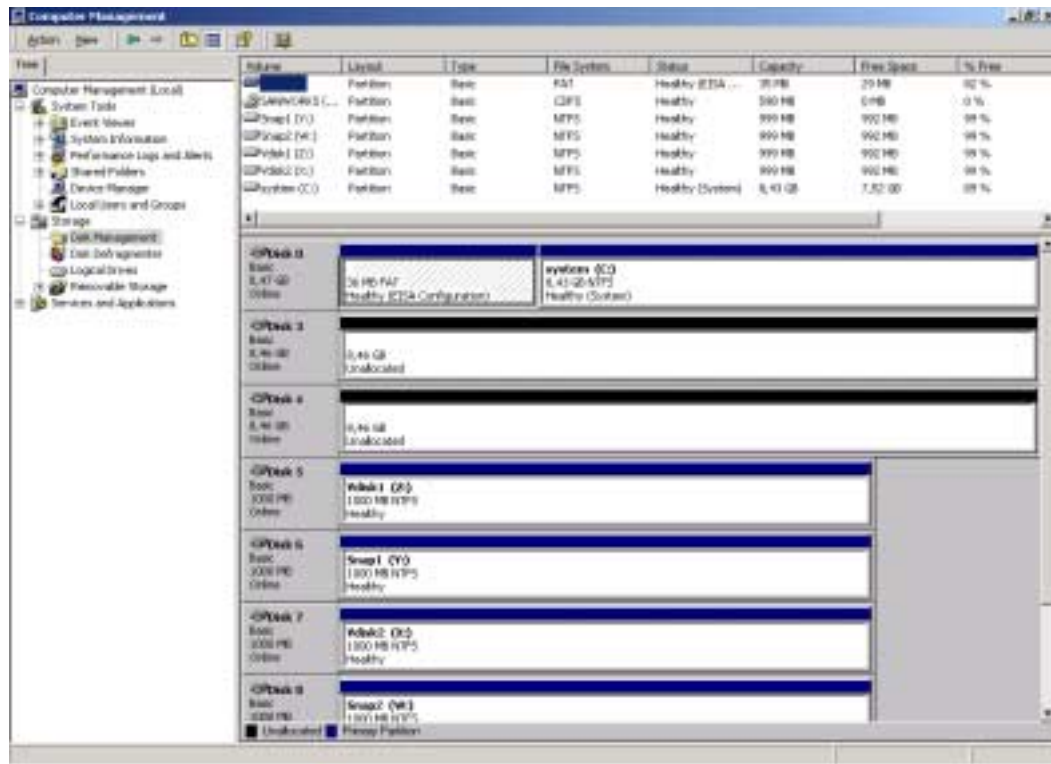
1. Right-click *My Computer* and select *Manage → Disk Management*.

   Note: If the "Welcome to the Write Signature and Upgrade Disk Wizard" screen appears, click **Cancel.**

2. Check on the right side of the disk management screen to ensure that the LUN presented from the storage unit is a Basic disk. If the disk is listed as a dynamic disk, right-click on the disk, then select and click *Revert to Basic Disk*.

3.	Right-click on the Unallocated Space section of the disk and select *Create Partition*.
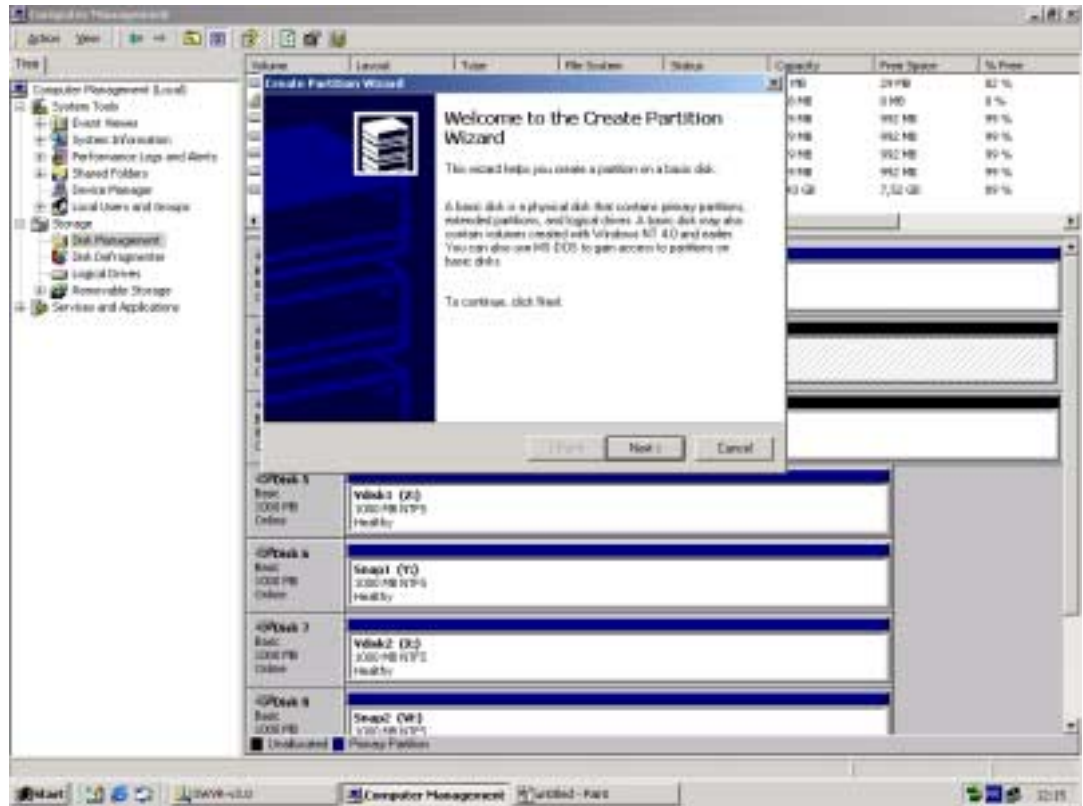
4.	Click *Next* on the Welcome to the Create Partition Wizard.
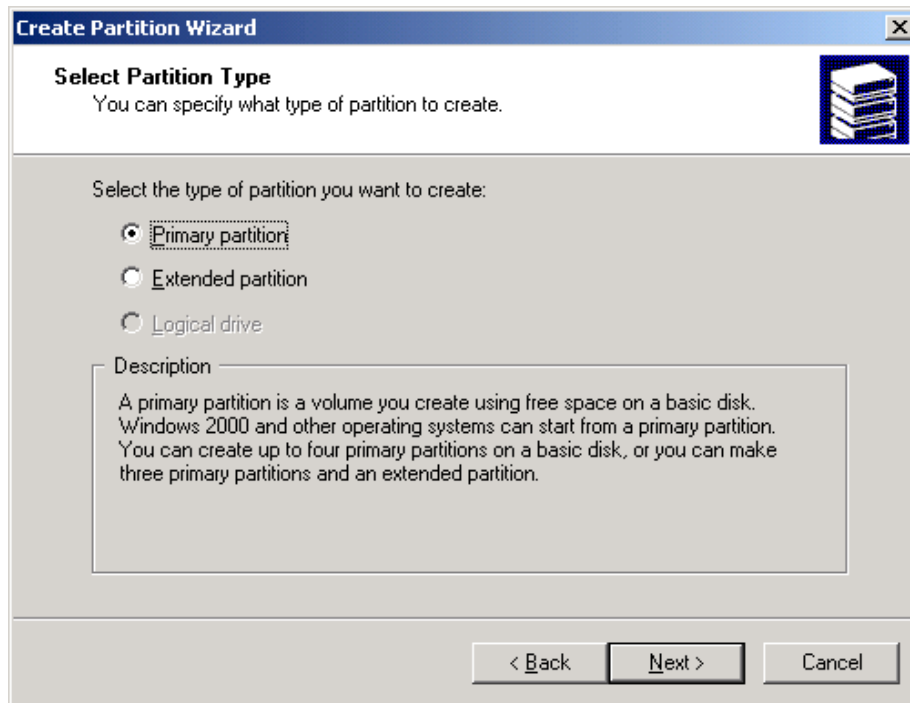
5. Click *Next* on the partition type screen (use the default of primary partition).
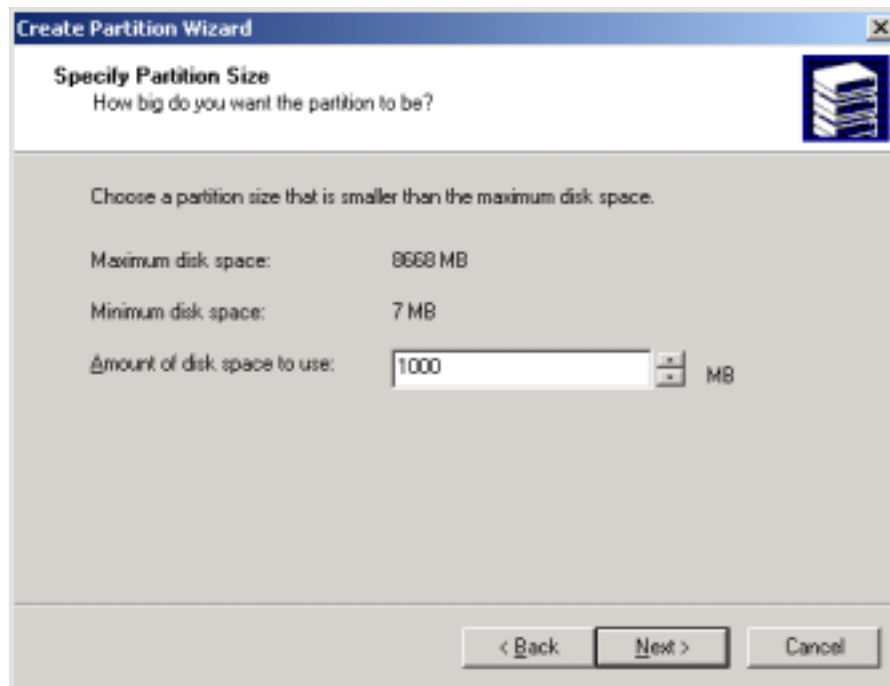
6. Create a 1000MB partition in the box provided by the wizard, and then click *Next*.
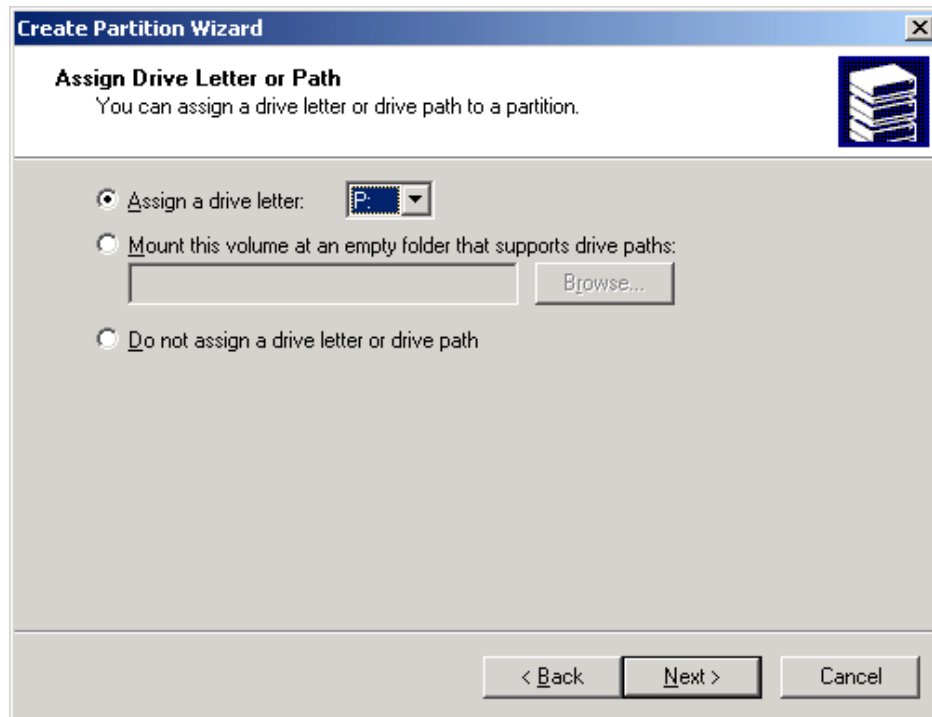
7. Assign drive letter "P" for this unit, in the box provided by the wizard. Click *Next*.
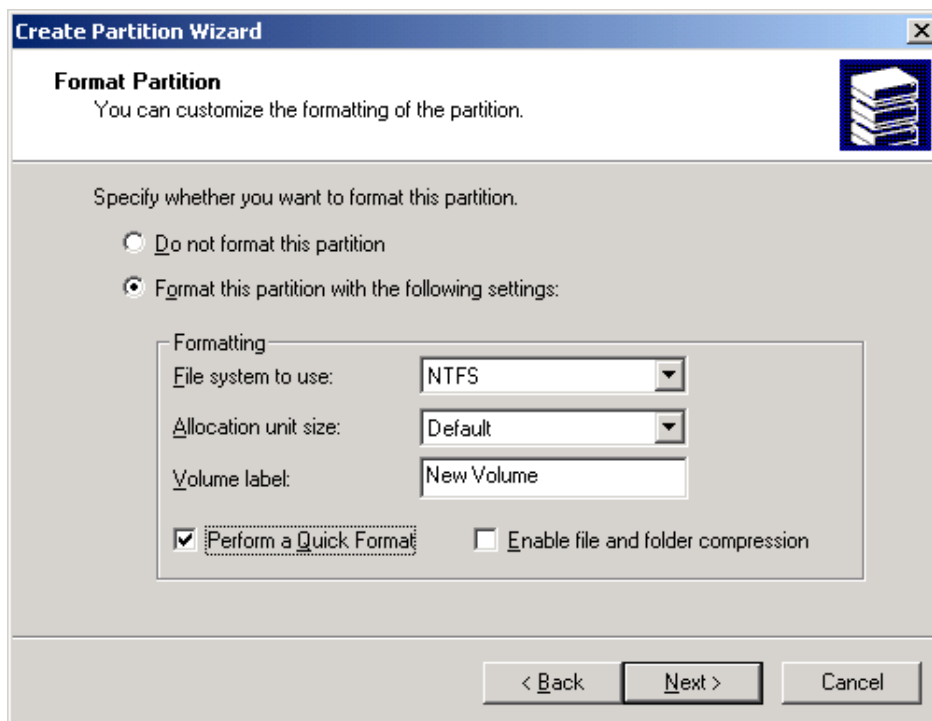
8. Select *Perform a Quick Format*.

9.   Click Next to format the partition using the default settings.
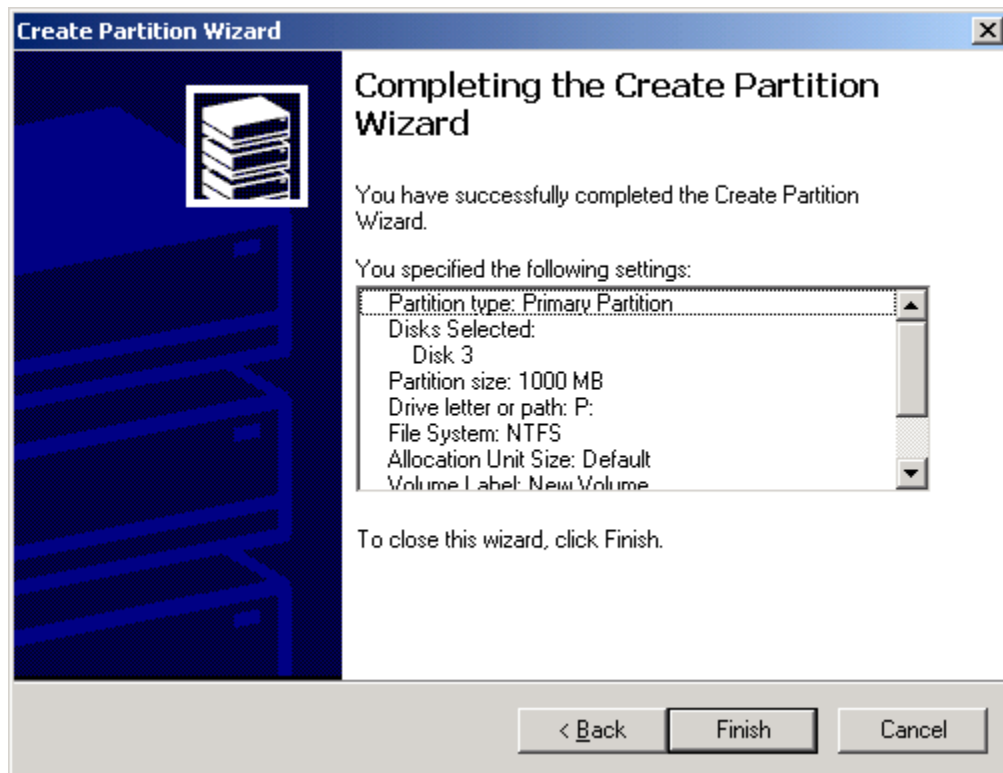
10.   The Completing the create partition wizard screen displays. Click *Finish*.

Allow the formatting to complete. The progress of the formatting is displayed on the disk management screen.
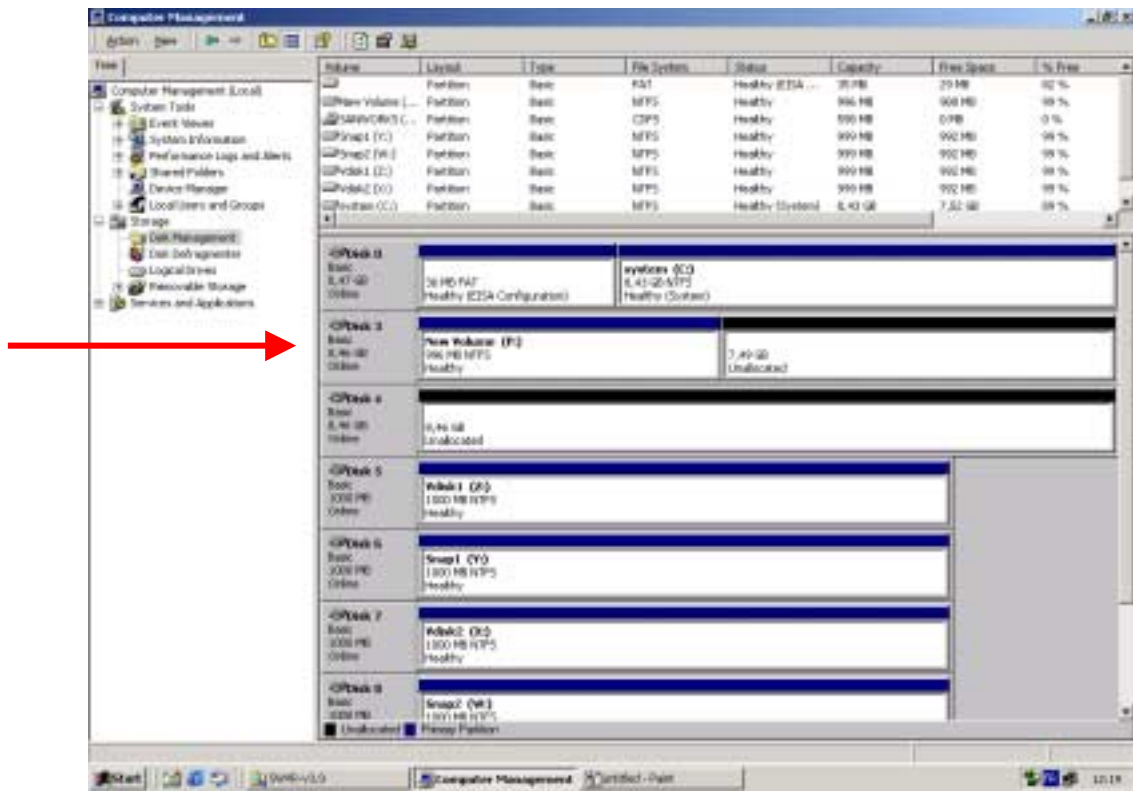
11. When format completes, close the disk management screen.

12. Double-click My Computer, and then double-click Drive P to confirm that is recognized as a volume.
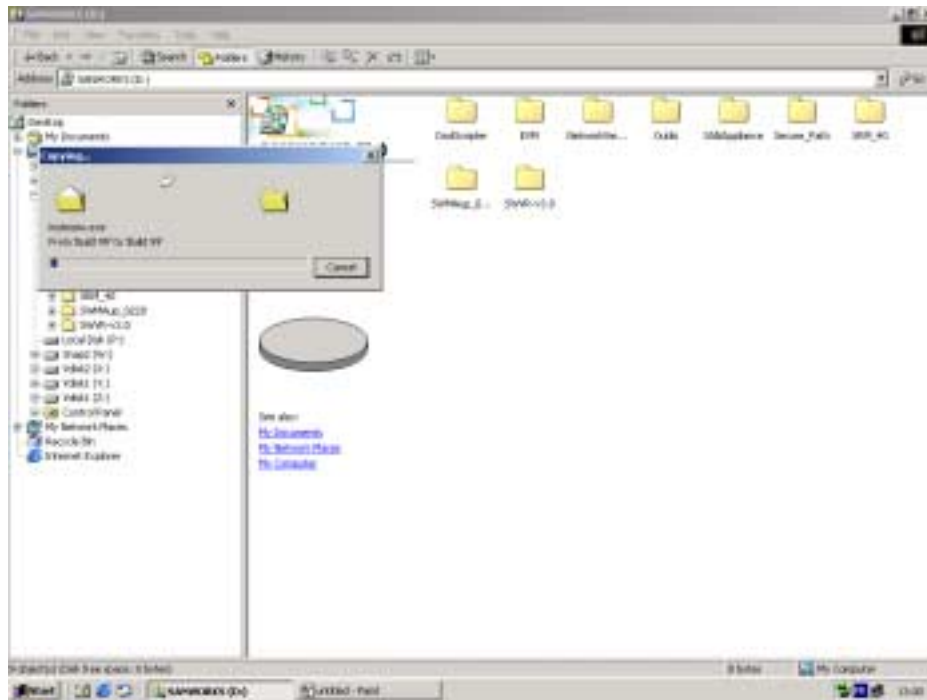
13. Select and copy files from drive C: to drive P:

14. Click on drive P to ensure that the files were copied.

15. Close the My Computer window.

16. Open Replication Manager.

17. Right click on Pool1, and select *All Tasks*, and then select *Import Unit*.

18. Click *Next* at the Welcome to the Import Storage Unit Wizard screen.

Import Unit

Import Unit
Select the Storage unit that you want to import into the pool.

Pool Information

Name	Pool1
Virtual Disks	2

□─ Disk 3 [LOCAL]
  ── P : NTFS : 996MB
  ── FREE SPACE : 7680 MB

< Back   Next >   Cancel
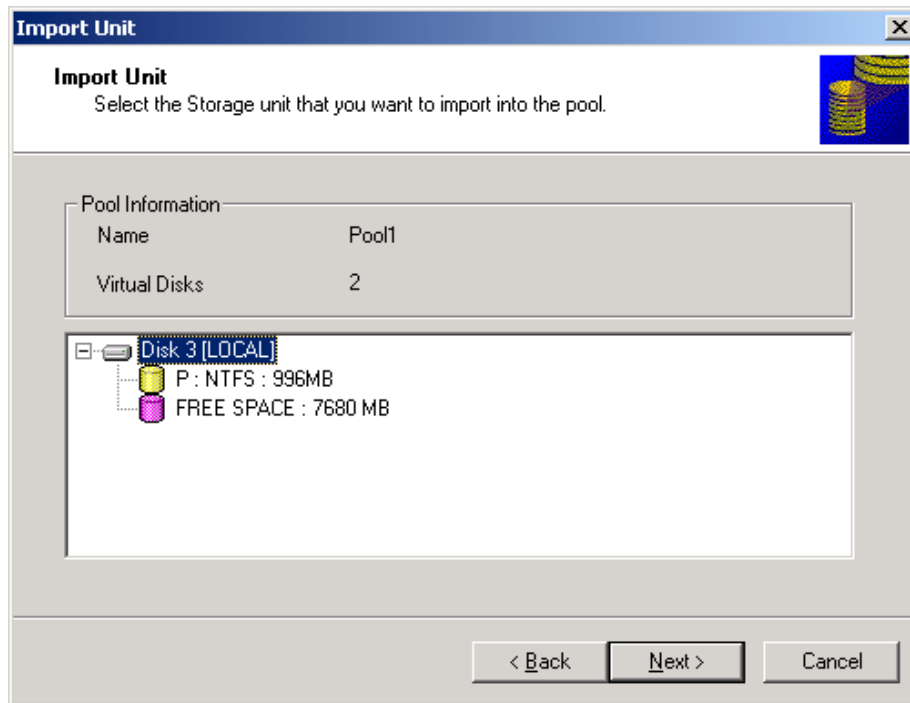
19. Select the unit created in the previous steps, then click *Next*.

Import Unit Wizard

Virtual Disk Information
Provide a name for the virtual disk.

Disk Information

Disk Number	3
Total Logical Drives	1

Virtual Disk Information

Drives	Logical Drive 1
Name	Partition
Drive Letter	P
Capacity	996 MB
File System	NTFS

Apply

< Back   Next >   Cancel
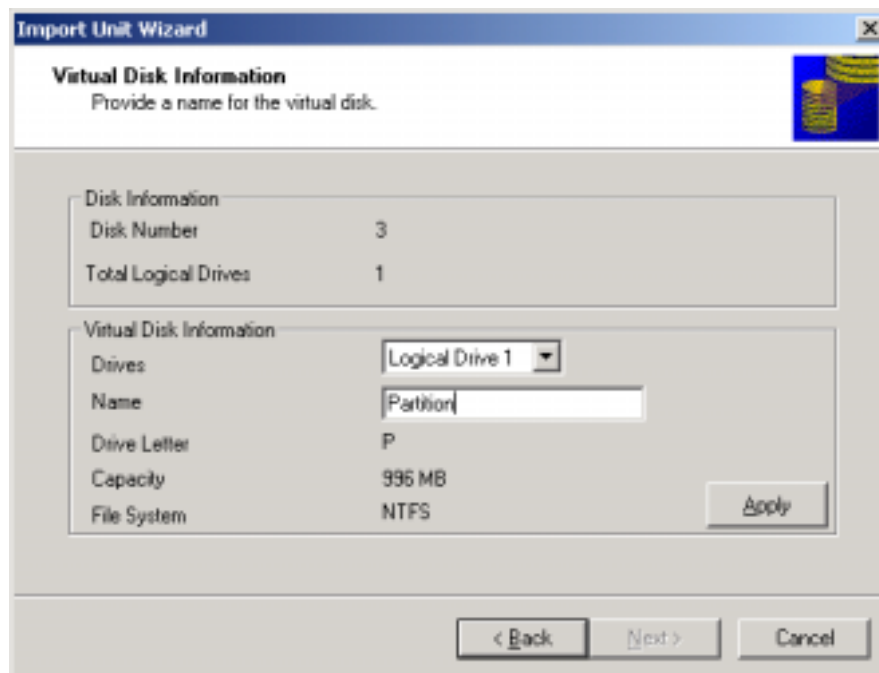
20. Type *Partition* in the disk name space.

21. Click *Apply* → *Next*.
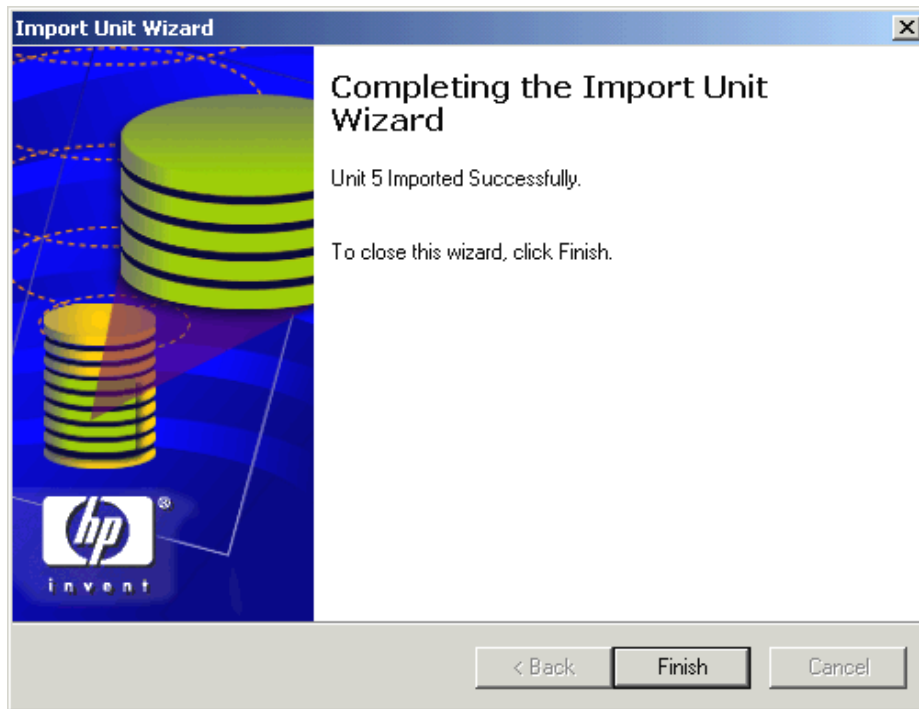
22. After the completing the import unit wizard screen displays, click *Finish*.

23. In Replication Manager, look at the capacity of Pool1 to see that it has increased by the size of the imported unit.
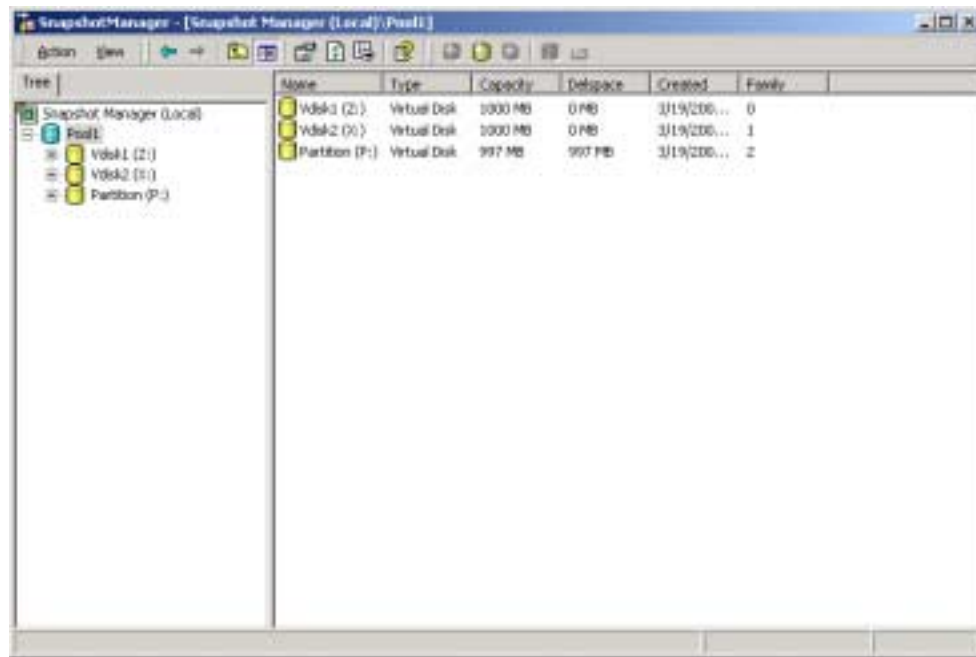
24. Double-click Pool1 to see that drive P is now listed as a virtual disk and is part of Pool1.

Section 2 - Online volume growth *(optional)*

Overview

Storage Virtual Replicator lets you increase storage capacity without disrupting operations on Windows 2000 or Windows 2003 systems. Normally, when you grow a RAID set, the operating system does not recognize the size change until you reboot. The Storage Virtual Replicator online volume growth feature directs the operating system to update the size of a physical or virtual disk without requiring a system restart.

There are two exercises in this section:

- Exercise 1: Growing a virtual disk

- Exercise 2: Adding storage to the system, expanding the pool, growing the virtual disk

> **Note**
> Online volume growth is an option only if the amount of free space is greater than the minimum space required by Storage Virtual Replicator.

Exercise 1: Growing a virtual disk

The purpose of this exercise is to grow a virtual disk, while the data remains online and accessible.

1. Open Replication Manager.

2. Expand the *Replication Manager (Local)* folder to display the pool and its virtual disks and snapshots.

   What is the size of *Vdisk1*?

   ....

3. Right-click *Vdisk1*.

4. Select *All Tasks → Grow Volume*.

   What other task options are available?

   ....

5. The online volume growth wizard appears. Click *Next*.
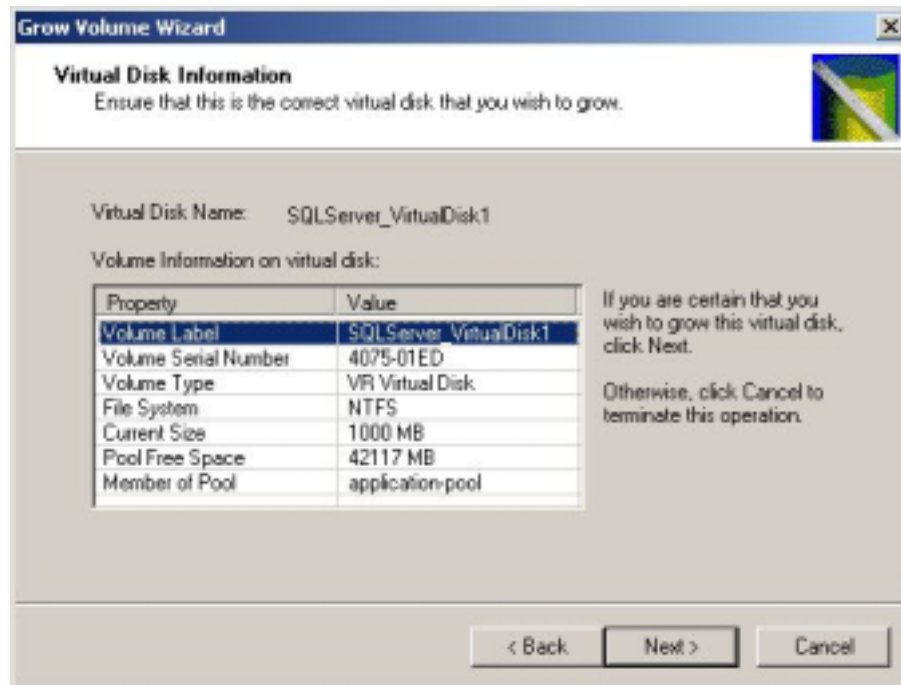
6.   Current volume information about the virtual disk is displayed.

      What is the current size of the virtual disk and the available free space in the pool?

      ....

7.   Click *Next*.
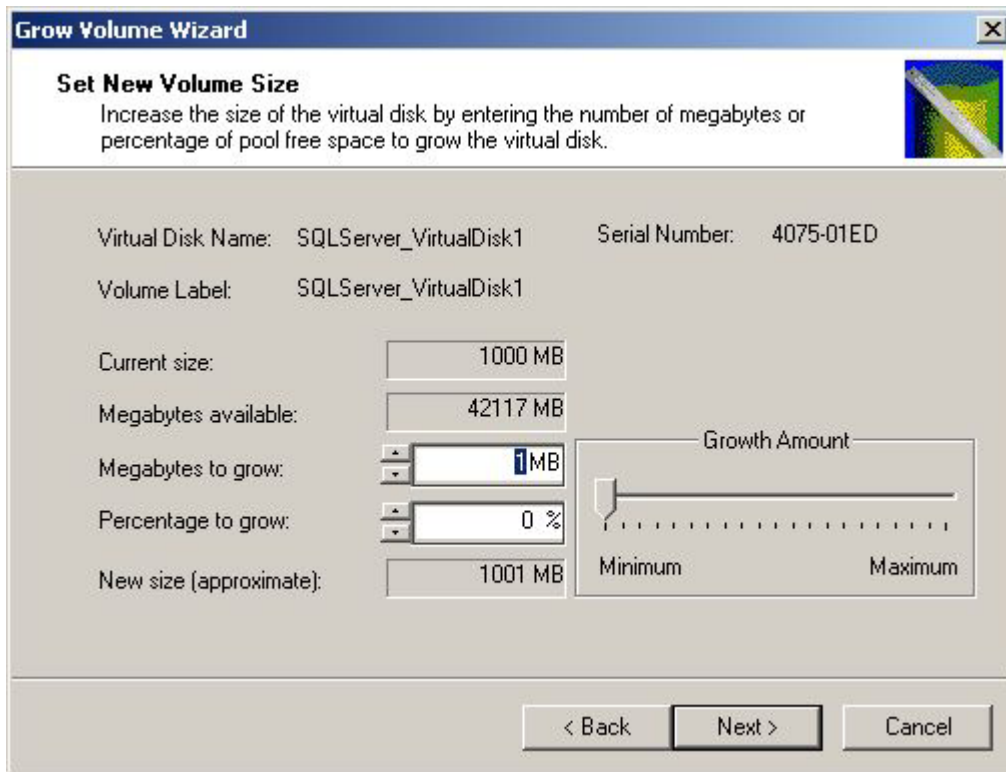
There are three methods of increasing the size of your virtual disk. You can enter the percent (of available free space) to add, use the slider, or enter the size in MB.

In the graphics above, what is the maximum amount that the virtual disk can be expanded?

....

The limit to which the virtual disk may be expanded is the free space available in the pool.

8. Choose to grow the virtual disk by *1024MB* (1GB).

9. Click *Next*.
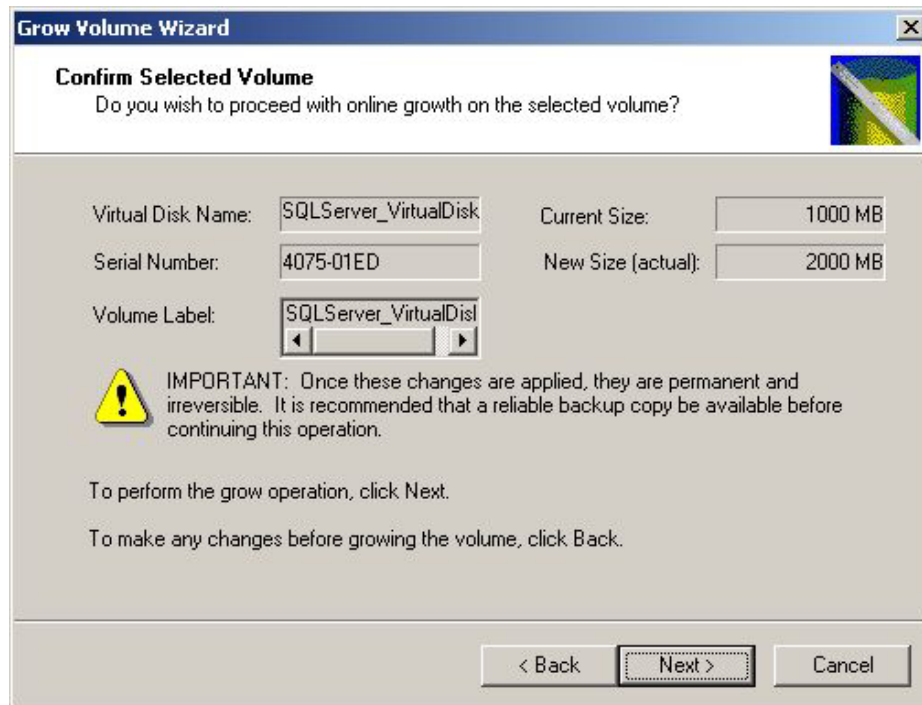
10. Click *Next* to confirm that you wish to grow the selected volume.
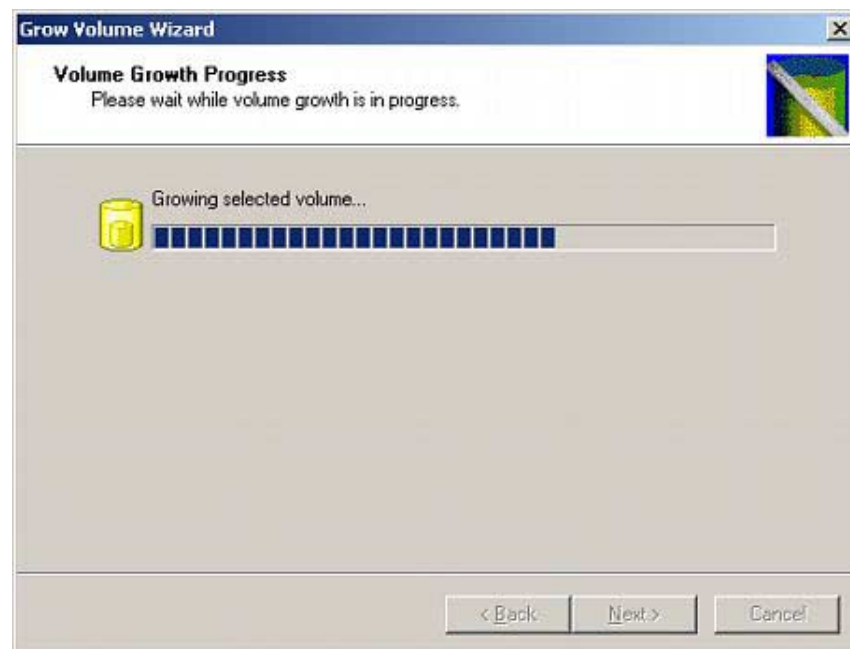
The growth progress displays.
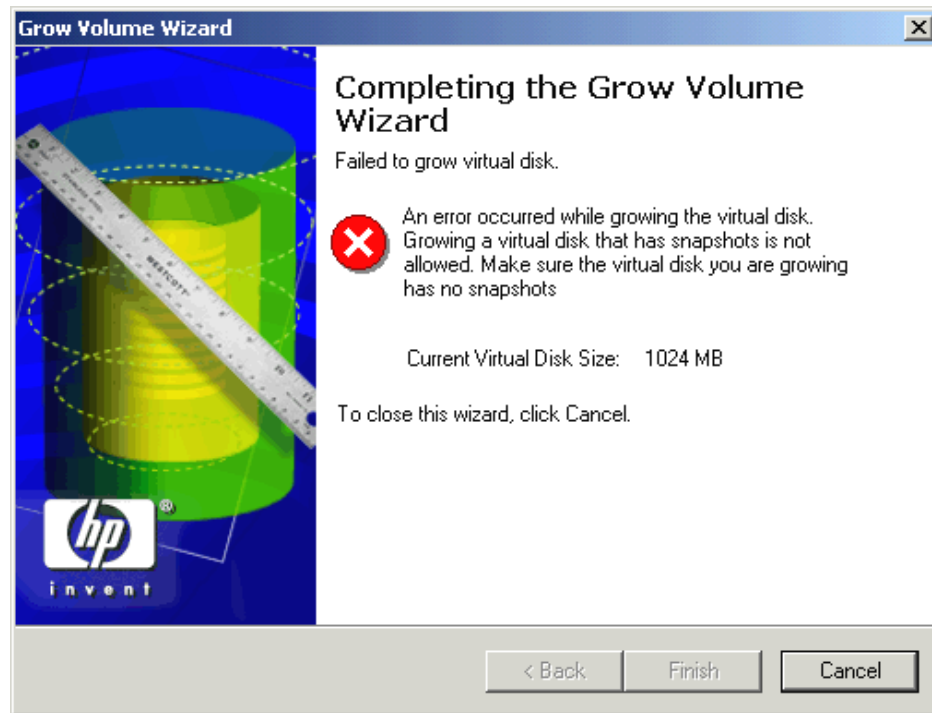
Was the volume growth successful?

....

If not, can you determine why?

....

11. Click *Cancel.*

12. At Replication Manager, right-click *Snap1* and select *Delete → OK.*

13. Repeat steps 3-10.

14. Click *Finish.*

15. Using Windows Explorer (or My Computer), select *Vdisk1.*

    What is the new size of Vdisk1?

    ....

Exercise 2: Adding storage to the system, expanding the pool, growing the virtual disk

The purpose of this exercise is to show how new storage is introduced to the system, added to the storage pool and used to facilitate additional growth of a virtual disk.

1. Using Windows Explorer (or My Computer), copy *Test.Bat* from C:\Sample Data to *Vdisk1*.

    If **test.bat** is not available, you can recreate it using notepad to enter the following commands:

    ```
    @echo off

    :infinite

    xcopy "c:\program files" \  /E /Y

    goto infinite

    end
    ```

    Save the file as test.bat on your Vdisk1 drive.

2. Double-click *Test.Bat* to begin running the batch file.

    Test.Bat provides continuous activity to *Vdisk1* to simulate a running application.

16. Arrange the CMD.EXE window so that it occupies the upper right hand corner of the screen. Leave it running.

3. Open Replication Manager.

4. Click the *Replication Manager (Local)* folder and expand to display the pool and its virtual disks and snapshots.

5. Right-click *Pool1* and choose *Properties*. Click the *Storage Units* tab. Click *Add*.

    What was the result?

    ....

6. Introduce an additional disk drive into an empty bay in your ProLiant Server or present another virtual disk from your storage system to your server.

> **Note**
>
> Use the appropriate management utility (ACU, CV EVA) to create a LUN to present to the host.

7. Allow the new device to spin-up.

8. Right-click *My Computer* and choose *Manage*.

9. Right-click *Disk Management* and select *Rescan Disks.*

10. If the new unit displays as a dynamic disk, right-click the new unit and select *Revert to Basic Disk.*

11. Close the computer management window.

12. Open Replication Manager.

13. Right-click *Pool1* and choose *Properties*.

14. Click the *Storage Units* tab.

15. Click *Add*.

> **Note**
>
> You may also right-click *Pool1*, select *All Tasks → Add Unit.*
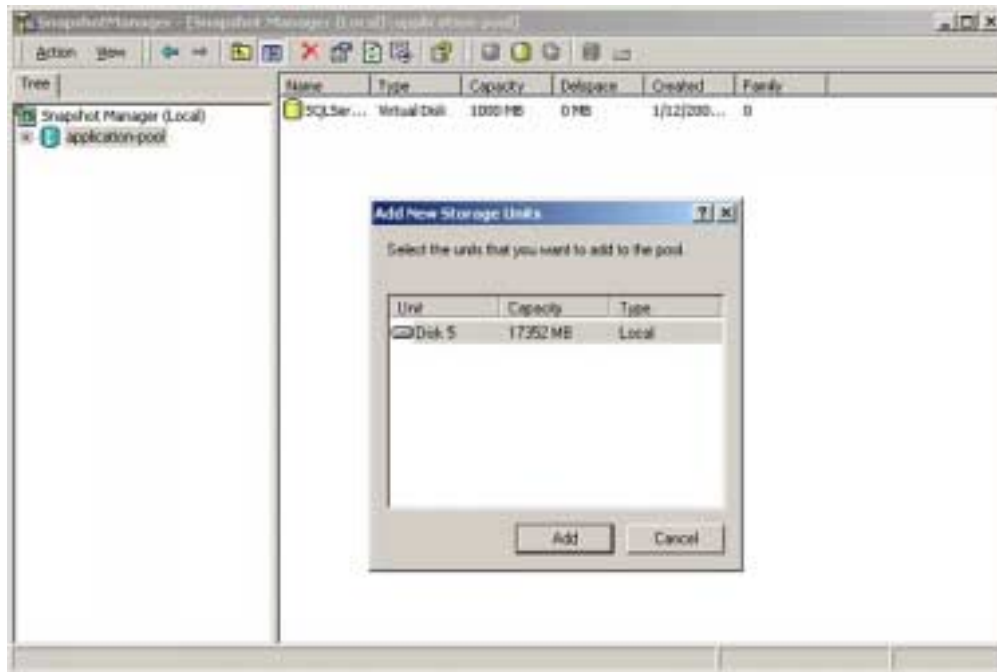
16. If requested, select the storage unit to add to the pool.

17. Click *Add* to add the new storage device to the pool.

    What was the affect (if any) on the copy operation?

    ....

18. Click *OK*.

19. Right-click *Vdisk1*. Choose *All Tasks → Grow Volume*.

20. The online volume growth wizard displays. Click *Next*.

21. Information about the virtual disk is displayed.

    What is the current size of the virtual disk and the available free space in the pool?

    ....

22. Click *Next*.

    The limit to which the virtual disk may be expanded is the free space available in the pool.

23. Choose to grow the virtual disk by *2048MB* (2GB).

24. Click *Next*.
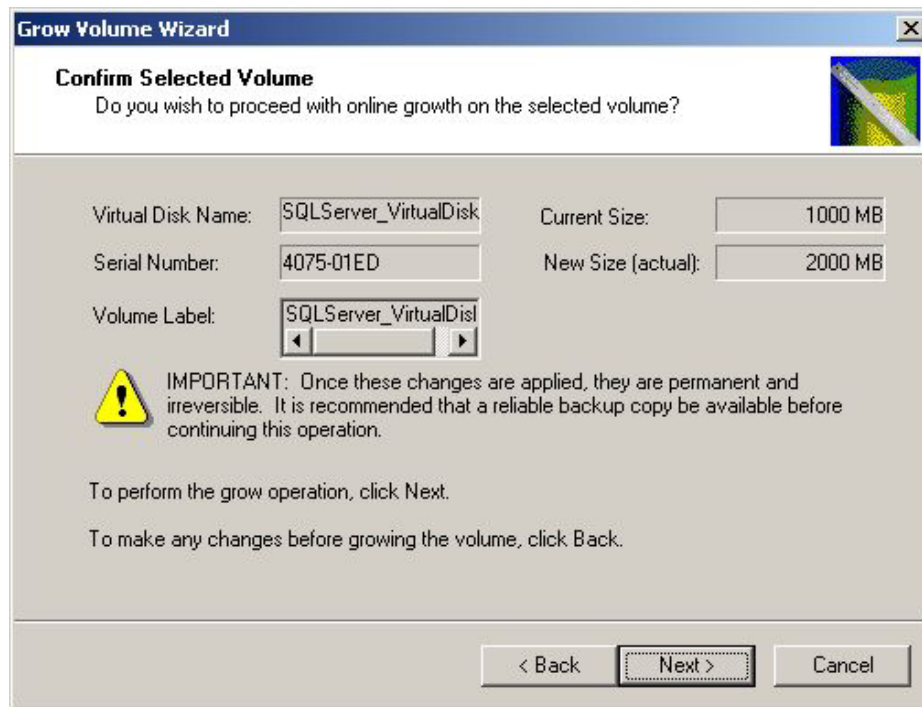
25. Click *Next* to confirm that you wish to grow the selected volume.
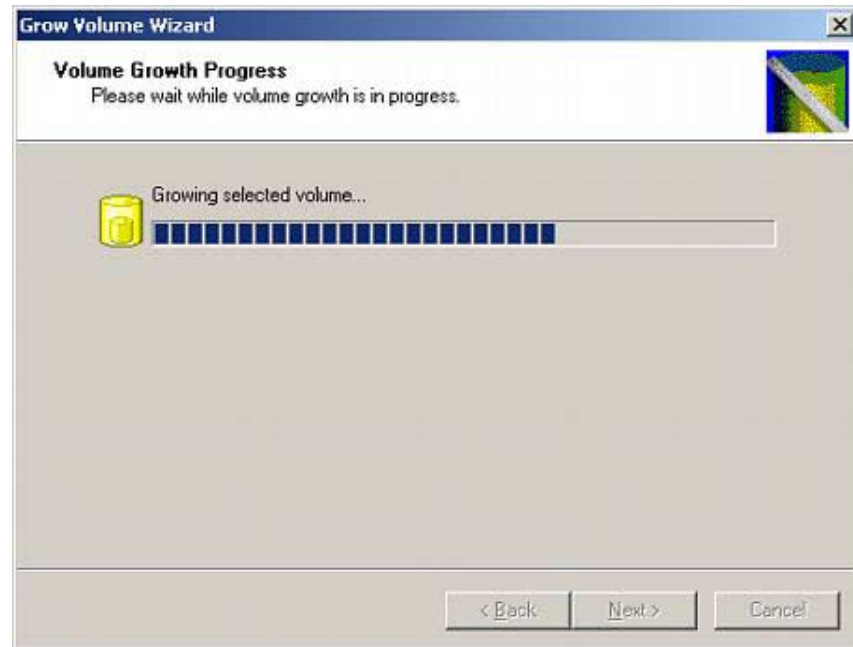
The growth progress displays.

What is the affect (if any) on the copy operation?

....

26. Click *Finish*.

27. Using Windows Explorer (or My Computer), select *Vdisk1*.

What is the new capacity of the virtual disk?

....

Section 3 – Deleting virtual disks, snapshot, and pools

Overview

In a normal business environment, a pool would not be deleted. The deletion of all snapshots, virtual disks, and the pool are included here to give you experience in the procedure.

There is one exercise in this section.

Exercise 1: Deleting virtual disks, snapshots and pools

To maintain optimum system performance, it is recommended that you avoid keeping snapshots for long periods of time if the data changes frequently.

When data on a parent disk changes, segments are copied-out to each snapshot of the parent disk. Storage Virtual Replicator keeps track of copy-outs by associating an address with each segment of data. During startup, Storage Virtual Replicator pools "rebind" by re-establishing these address connections. The rebinding process is usually quick, but can take much longer if you have a lot of snapshots containing large amounts of changed data (copy-outs).

> **Note**
>
> Storage Virtual Replicator provides a utility, called SmartSnap, that can automate the number of snapshots maintained for a virtual disk. SmartSnap can be invoked from the command line.

Accordingly, Storage Virtual Replicator should not be considered your only means of backup. It is recommended that you use Storage Virtual Replicator in conjunction with a standard backup tool

> **! Important**
>
> In a normal business environment, a pool would not be deleted. The deletion of all snapshots, virtual disks, and the pool are included here to give you experience in the procedure.

The purpose of this exercise is to delete a pool and its contents.

1. Open Replication Manager.
2. Right-click *Pool1*.

3. Select *Delete*.

    Were you able to delete the pool?

    ....

    What message did you get?

    ....

4. Right-click *Vdisk1*.

5. Select *Delete*.

    Were you able to delete the virtual disk?

    ....

    What message did you get?

    ....

6. Right-click *Partition*.

7. Select *Delete*.

    Were you able to delete the virtual disk?

    ....

    What message did you get?

    ....

8. Right-click *Pool1*.

9. Select *Delete*.

    Were you able to delete the pool?

    ....

    What message did you get?

    ....

10. Close Replication Manager.

This completes this lab.

Objectives

After completing this module, you should be able to:

- Install the power and I/O cables to the HP OpenView Storage Management Appliance.

- Establish communication with the Storage Management Appliance.

- Log on to the Storage Management Appliance.

Initial installation

The physical installation consists of seven parts:

1. Mount appliance into rack

   The front of the installation manual has instructions for rack mounting the appliance. Due to hardware constraints, the appliance will already be installed for the purposes of this class. This lab may be used in a testing environment.

2. Connect Fibre Channel cables

   The appliance has two Emulex LP8000 PCI-to-Fibre Channel adapters. Ensure that at least one LP8000 connects to the SAN through the HP Fibre Channel switch. The adapter has one subscriber connector (SC) type Fibre Channel connection that has transmit and receive ports. Observe the connector keys to prevent improper connection. Push on the connector until there is a positive "click".

3. Connect Ethernet cables to appliance

   The appliance uses two Ethernet cables. One cable connects to the bottom side of the back of the appliance and provides standard Ethernet connectivity to the unit. The second cable connects to the Remote Insight Lights Out Edition board (RILOE) to allow remote access to keyboard, video, and mouse functions of the appliance. The RILOE board mounts into a PCI slot near the LP8000 Fibre Channel adapter.

4. Connect mouse, keyboard, and video cables

   The Management appliance provides remote management of mouse, keyboard, and video functions. To do this, the RILOE board must intercept the keyboard, mouse, and video signals. In the shipped equipment, there is a "Y" shaped cable that provides the RILOE board with this capability to intercept the keyboard and mouse signals. Plug the single end of the "Y" cable into the plug on the RILOE board, and then plug the other two ends into the keyboard and mouse ports on the appliance as appropriate. There are pictures of the mouse and the keyboard on the cable ends to distinguish between them. Additionally, there is a connection in the RILOE for the video adapter cable, which must be used when connecting a monitor to the Storage Management Appliance.

5.   Connect power supply cable to RILOE board (optional for lab; required if using RILOE board in operational environment).

The RILOE board allows monitoring of the blank screen and the power up sequence. It also allows access to the BIOS and other low level features as long as the RILOE board has external power. Try to provide power to the RILOE board from a different source than that which supplies the appliance.

6.   Apply power to the appliance

Plugging in the power cables provides power to the machine. If the machine does not power up, remove the front plate and press the power switch. The power switch is in the front of the machine.

Establishing communication

The software for the Storage Management appliance is pre-loaded at the factory to provide "Plug and Play" connectivity. When the appliance initially starts, it uses Dynamic Host Configuration Protocol (DHCP) to establish an IP address; therefore, ensure that DHCP and DNS are working in the network. If DHCP and DNS are working on the network, then the appliance will be able to communicate.

!   **Important**

On the first generation of the Storage Management Appliance, the Storage Management Appliance name consisted of "SWMA" plus the first 8 characters of the serial number. For the second generation the Storage Management Appliance name is "SMA" plus the entire serial number. For this lab we will assume the use of a second generation Storage Management Appliance so your Storage Management Appliance name may not be in the format shown.

To determine the current state of connectivity, follow these steps:

1.   Select *Start → Run → cmd*.

2.   From the command line enter the following command:

```
c:\> ping SWMAxxxxxx (1st generation Appliance)
```

where xxxxxx is the last six characters of the serial number of the Storage Management Appliance.

```
c:\> ping SMAxxxxxxxxxxxx (2nd generation Appliance)
```

where xxxxxxxxxxxx is the serial number of the Storage Management Appliance.

3.   The appliance responds with a message similar to the following:

Pinging SMAxxxxxxxxxxxx [100.100.100.100] with 32 bytes of data:
or
Pinging SWMAxxxxxx [100.100.100.100] with 32 bytes of data:

```
Reply from 100.100.100.100: bytes=32 time=1ms TTL=128

Reply from 100.100.100.100: bytes=32 time<10ms TTL=128

Reply from 100.100.100.100: bytes=32 time<10ms TTL=128

Reply from 100.100.100.100: bytes=32 time<10ms TTL=128
```

If name resolution was successful, proceed to the section, "Connecting to the Storage Management Appliance."

If DNS is not functioning, you may get the following response:

```
Unknown host SMAxxxxxxxxxxxx (or Unknown host SWMAxxxxxx)
```

If you are unable to ping the appliance by name, perform the following steps:

1. Find the tag on the appliance that has a number on it beginning with "RIB." This is the Ethernet name of the RILOE board. The RILOE board does not depend on DNS for name resolution. Check to see that the RILOE board is answering with the ping command. If the RILOE board answers the ping, go to step eight.

2. If the RILOE board does not answer the ping, check all cable connections. Connect a keyboard, mouse, and monitor to the Storage Management Appliance to access the desktop. The RILOE board disables the monitor port on the Storage Management Appliance so ensure that you plug the monitor into the RILOE board monitor port. After accessing the desktop, go to step nine.

7. The RILOE board does not support access by multiple browsers. Observe as the instructor connects a browser to the RILOE board name and accesses the following screen:
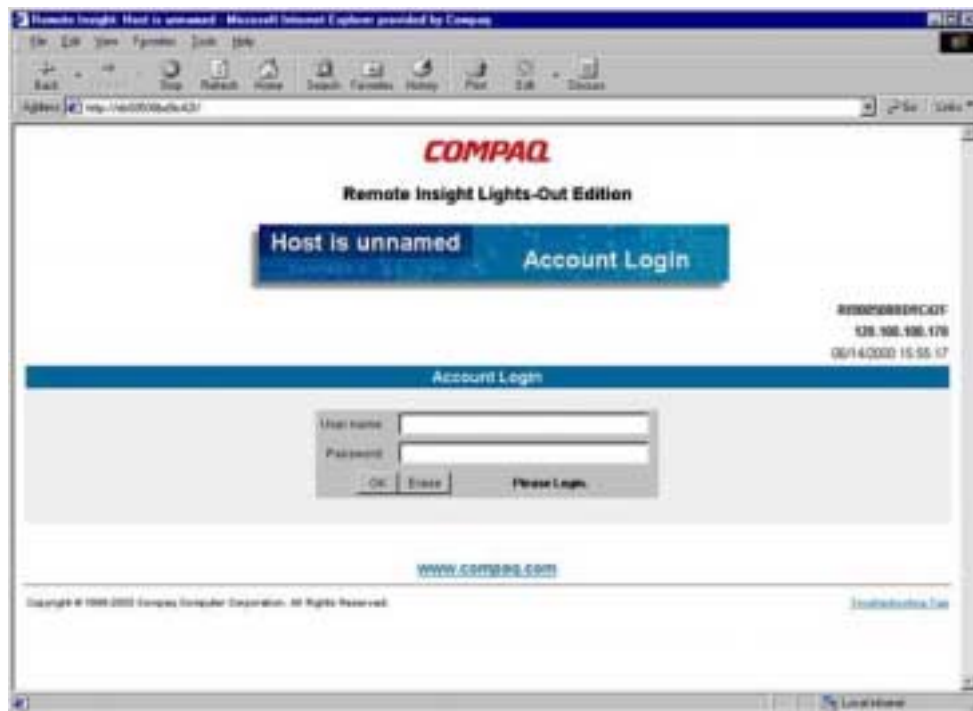
Enter the appropriate user name and password information (located on the RILOE tag) and then access the following screen:

Use the following screen to set static IP addresses and other TCP/IP parameters:
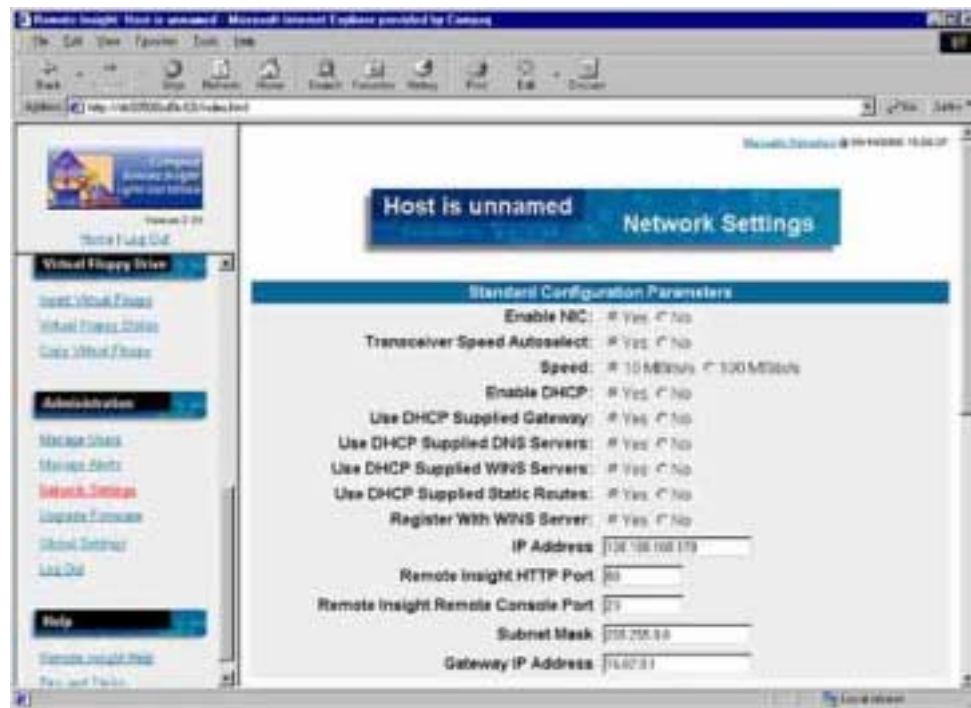
Then access the Storage Management Appliance desktop.

8. From the desktop, select *Start → Run → cmd*.

9. From the command line (DOS) prompt, enter the following command:

```
c:\> ipconfig
```

10. This will provide the IP address that DHCP gave to the Storage Management Appliance. Note the IP address.

11. After the instructor supplies the IP address of the Storage Management Appliance, add an entry to the hosts file to perform name resolution locally. On the local machine, open a DOS window, go to the c:\windows directory, and enter the following command:

```
c:\windows\> dir hosts
```

12. Locate the hosts file. Edit the file by going to the end and adding an entry similar to the following:

```
100.100.100.100          SMA0123456789AB
```

or

```
100.100.100.101          SWMA0123456
```

13. Ping the Storage Management Appliance as in step 3. If the Storage Management Appliance does not respond, recheck all of the steps.

Connecting to the Storage Management Appliance

1. Activate the browser and at the title location bar, enter the following URL:

   http://SMAxxxxxxxxxxxx:2301 (2nd generation Storage Management Appliance)
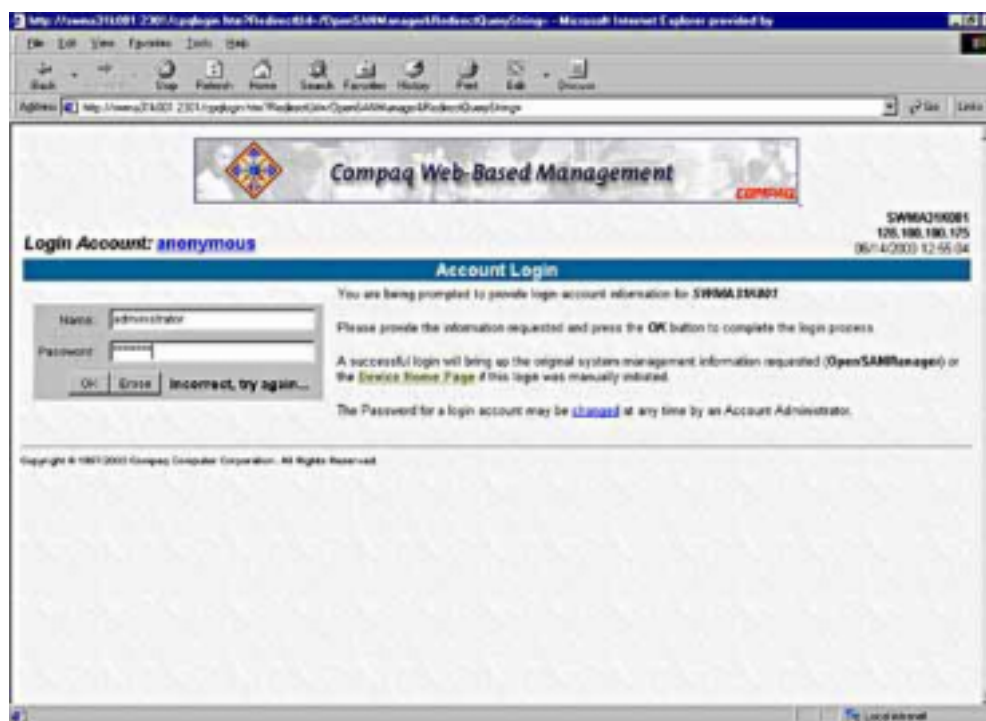
   or

   http://SWMAxxxxxx:2301 (1st generation Storage Management Appliance)

   The following screen displays:

2. Click on the SMA box to continue. The following screen displays:

3. Log on to the Storage Management Appliance with user name/password *administrator/administrator*.

4. If the above window displays, skip to the section, Installing Patches. If the above window **does not** display, your SMA has not been updated to the current software. Continue with the next section.

Updating the Storage Management Appliance Software

Use this procedure to update your Storage Management Appliance Software from V1.0C to V2.0.

1. Log on to your Management Appliance.

2. Select *Applications → Installation Services → Install Products* to display page 1 of the Install a SANworks Application wizard.

3. Choose one of the following methods to install the update.

■ CDROM—Insert the update CD-ROM into the CD-ROM drive.

■ Network—Enter the requested information.

■ Appliance—You must first copy the installation file (SWP) to the C:\Compaq\swpinstallkits directory on the appliance before selecting this option.

Normally you would choose the option that is best for your storage environment. For this exercise, you will install the updates using the CDROM option.

4. Click Next Step to display page 2 of the Install a SANworks Application wizard.
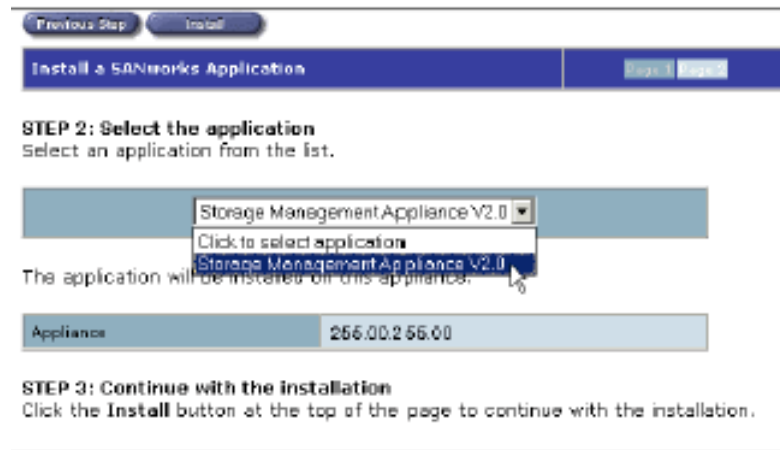
5.   Choose Storage Management Appliance V2.0 from the drop-down list.

6.   Click the Install button at the top of the page.

       An informational dialog box appears asking you to confirm the software installation.

7.   Click OK to start the installation process. The setup program displays an installation progress page.

       After some time the system displays a countdown timer showing you the status of the installation process.
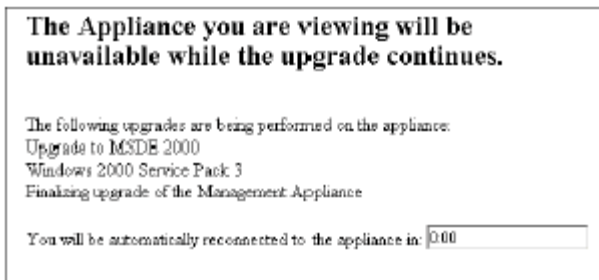
       Be sure to wait until the system has rebooted and automatically logged you on again, before using the new version of Storage Management Appliance Software. This process takes approximately 45 minutes.

You follow the same basic installation steps when installing the update directly on the Management Appliance. However, at a couple of points the system response is different from what you see when installing the update remotely.

During step 7 the system displays a DOS window with messages indicating the progress of installation. Then the Management Appliance completes a reboot and briefly displays a Windows logon dialog box. Do not attempt to logon or make entries in the Logon dialog box during this sequence. The installation process automatically completes the Windows network logon and finishes the installation.

Installing Patches

The next step is to update the Storage Management Appliance Software with the current patches.

! **Important**
  All other updates **must** be installed first.

---

1. Download the latest update file from the HP Storage Management Appliance Software Update website.

2. Extract the zipped files which include a *swp* file and at least one *readme* file with installation instructions to the temp directory on your local *C:* drive.

    You can also copy the files to a CD then load the CD in the Storage Management Appliance and copy the files as instructed in the following steps.

3. Ensure that your local (*C*) drive is shareable from the Storage Management Appliance.

4. Open a Terminal Services session to connect and log in to the Storage Management Appliance.

    If Terminal Services are not available, connect a monitor, mouse, and keyboard to the Storage Management Appliance.

5. From the Storage Management Appliance, connect to your local drive that contains the *swp* file.

6. Copy the file from the share (or CD) into the *C:\COMPAQ\SWPInstallKits* directory on the Storage Management Appliance.

7. Disconnect from the file share drive.

8. Log off Terminal Services or disconnect the monitor, keyboard, and mouse.

9. From a client computer, login to the Storage Management Appliance using your Web browser.

10. Select *Settings → Maintenance → Install Software.*

11. After the Welcome to the Installation Wizard opens, click *Next.*

12. Select *Local Disk on the Storage Management Appliance*.
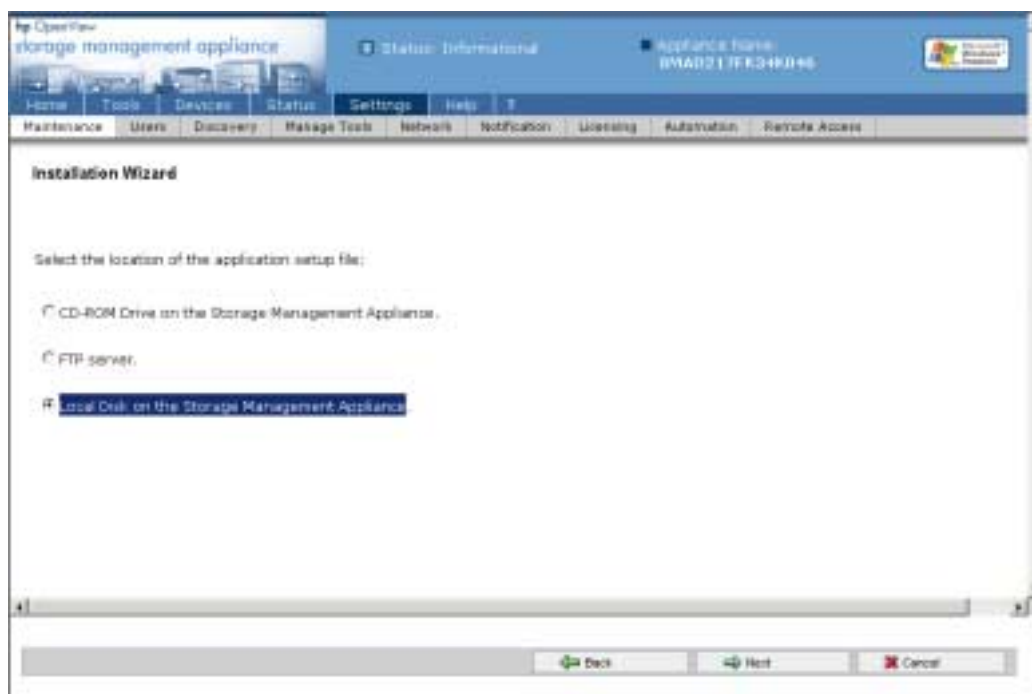
13. Click *Next.*

14. From the drop-down list box, select the appropriate *swp* file and then click *Next*.

15. The Installation Wizard will confirm the update selected after selecting Next and display *Warning: The Storage Management Appliance will restart after the install is complete*. Click *Next* to continue.

The installation will begin and the Storage Management Appliance will reboot.

This completes this lab.

Objectives

After completing this lab, you should be able to:

- Identify the three main areas of the HP OpenView Storage Management Appliance Software screen.

- Navigate the major areas of the Storage Management Appliance Software.

- Configure the HP OpenView Storage Management Appliance.

Screen areas

The user interface to the Storage Management Appliance is a browser-based program called Storage Management Appliance Software. The main screen of the Storage Management Appliance Software contains two main areas, the session pane and the content pane.

Session pane

The session pane is located in the upper portion of each page and consists of an informational section and the navigation section.

The informational section displays the Appliance name and system status.
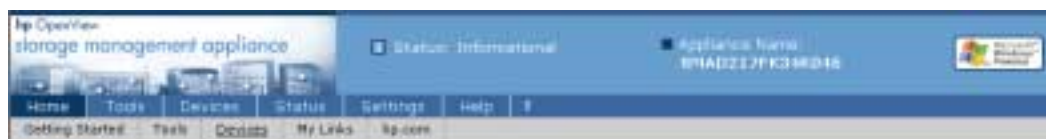
The navigation section contains two navigation bars, primary and secondary. Use the primary navigation bar items to open the primary pages (Home, Tools, Devices, Status, Settings, and Help) and the secondary to open the secondary pages.

Content pane

The content pane contains information formatted as a links page or as a task page.
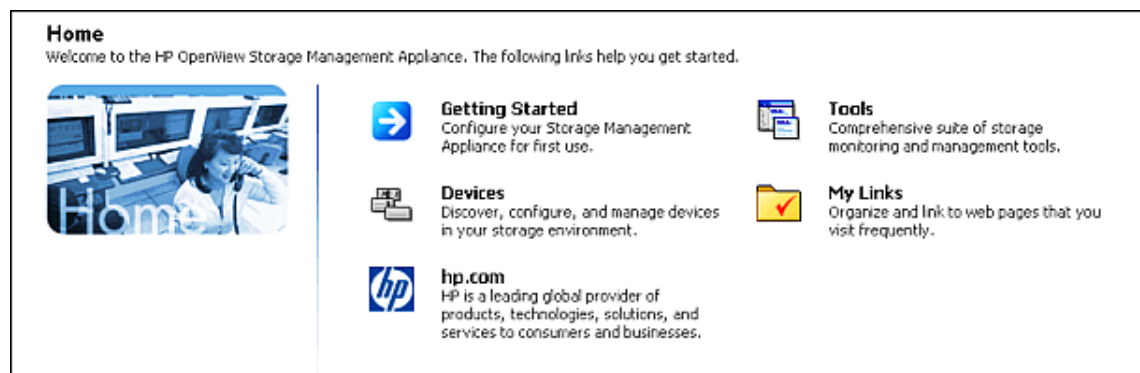
Home page

Log in to your Storage Management Appliance. (Refer to the installation lab if you are having trouble accessing your appliance.)

Getting Started

1. From the content pane or the secondary navigation bar, select *Getting Started.*

    Notice that the secondary navigation bar did not change. Normally the secondary navigation bar displays the same links as the content pane. This does not occur from the Home page because all the links in the content pane, except for the Welcome, are accessible from other pages.

2. Click *Welcome* and read through the information displayed. Close the page when finished.

3. Click *Set SMP Server* and enter the host name or IP address of your workstations to receive mail notification.

4. Click the remaining links on the Getting Started page and familiarize yourself with their operation. If changing settings, note the original settings and change back to them.

My Links

1. From the secondary navigation bar, select *My Links.*

    You can also select *Home* then *My Links* from the content pane.

Note
The *Tools* and *Devices* links from the Home page will be explored in the following sections since they are links on the primary navigation bar.

2. Select Configure → New.

3. Enter the information requested and click *OK*.

    You can enter the URL of a SAN switch or, if an internet connection is available, you can enter the HP website for the Storage Management Appliance User Guide.

    Use this procedure to create Web links to websites you access frequently.

hp.com

Click *hp.com*. If Internet access is available in the lab, a new window displays linking you directly to the HP OpenView Storage Management Appliance Overview and Features page on the HP website. You may keep the window open for future reference or close the window.

Help pages

The primary navigation bar has two help options to find information quickly.

From the primary navigation bar, click *Help*. A new window opens displaying the help features as well as the current Storage Management Appliance Software version number and service pack. Explore the Contents pane to review the extent of the help provided. Keep the window open for reference during this lab.

Return to the My Links page and click the question mark (*?*) to display a context-sensitive help topic describing the current page. Use that feature throughout the lab to help clarify information.

Tools page

Using either the primary or secondary navigation bars, click *Tools*.

The Tools screen displays the optional software loaded on the appliance. A user assigned the administrator or operator privilege level can launch any value-added HP storage management application displayed on the Tools page.

Do not click on any of the links at this time. Later in the course those links will be used.

Devices page

Click Devices in the primary navigation bar to display the following page:

- **Discovered Devices** — Lists devices found by all IP discoveries.

- **Command view eva** — Launches the GUI for managing and configuring the HSV controller-based arrays.

- **HSG element manager** — Launches the element manager for managing and configuring the HSG controller-based arrays.

Discovered Devices

1. On the secondary navigation bar or the content pane, select *Discovered Devices.*

2. Select the appliance you are now accessing and select *Launch* in the Tasks column to initiate a discovery.

3. Again select the appliance you are now accessing and select *Properties.*

   This page shows general properties that the Management Appliance has discovered for the device, such as manufacturer, model name and number, and IP address.

4. Select *Owner, Location,* and *Details* to view what additional information about the device or application you can enter. Click *OK* when finished.

   Notification can be configured from this page; however, this Lab will complete Notification configuration using the Settings page.

Command view eva

5. On the secondary navigation bar or the content pane, select *Command view eva*.

6. Select one of the storage systems or select *Discover* if only unmanaged systems appear in the navigation tree.

7. If desired, take a couple of minutes exploring the different options in the navigation tree to review command view eva functionality. After all labs in this module are complete, a return to command view eva may be initiated with your instructor's permission.

8. Close the command view eva browser window.

HSG element manager (optional)

If you have little or no experience with the HSG element manager and need to review its functionality, notify your instructor. He can provide an Addendum Lab for you to complete after all labs in this module are complete.

Status page

Click *Status* on the primary navigation bar to display the following page.

Logs

1. Click *Logs* on the secondary navigation bar or the Content pane.

2. Click Event Log.

3. In the Search window ensure *Type* is selected. Type *failure* in the window, and then select *Go*. All failure log entries will appear in the new window. If none exist, the window will be devoid of entries.

4. Click the double triangles adjacent to the *Go*. The second page of the Event Log will display.

5. Click *Date.* The entries will be sorted in descending order. Click *Date* again to sort in ascending order. All columns can be sorted in descending or ascending order by clicking on the column title.

6. Hold the cursor over an event code to display a short pop-up description.

7. Click a specific log entry, and then *Event Details* to view the details of a specific log entry.

8. Click *Download Log ....* The Download Log page appears.

9. Click the question mark (*?)* on the primary navigation bar. Read through the Downloading Log Files help page.

    The Download Log page does not appear for what log?

    …………………………………………………………………………………

    The Windows event log file option is not available for what logs?

    …………………………………………………………………………………

10. Close the Downloading Log Files help page.

11. From the Download Event Log page, click *Download Log ....* Click *Save* from the File Download window. Select a directory to save the file to the workstation from which you are browsing to the Storage Management Appliance.

    Notice that you can also *Open* the file from the download window.

12. Click B*ack* to return to the Event Log page.

13. Click *Log Properties,* and review the modifications that can be made to the log.

What changes can be made to the log?

……………………………………………………………………………………

……………………………………………………………………………………

……………………………………………………………………………………

14. Click *OK* to return to the Event Log page.

15. Click an event you have already viewed, and then click *Acknowledge.* Click *OK* to the confirmation page.

The event will disappear or display a Yes in the *Ack* column depending on your selection on the Log Properties page.

16. Click the box at the top of the Type column. All entries will be selected. Click two entries to deselect them. All selected entries can now be acknowledged.

17. Click *Clear Log.* All entries can be permanently cleared from the log. Click *Cancel* on the Confirmation page.

18. Click *Back* to return to the Logs page.

19. Click any of the other logs and explore their functions.

The functions of the other logs are similar to that of the Event Log with the following exceptions.

What only other log besides the Event Log has the acknowledge option?

………………………………………………………………………………

What option is not available for Web Administration, Backup, and Restore logs?

………………………………………………………………………………

What option is available for the License Log?

………………………………………………………………………………

Details

20. Click *Back* to return to the Status page. A summary of the unacknowledged events will be displayed on the Status page under Details.

21. Click the link under Details to display options to view or acknowledge the events. Clicking *View Events* will display the Event log. Clicking *Acknowledge* will acknowledge all the events.

Management Agents

From the secondary navigation bar, click *Management Agents.*

A new browser window opens with the initial page of the Insight Manager displaying information about the Storage Management Appliance's hardware elements. This is the same Insight Manager agent that is deployed with all HP Proliant Servers.

Click on a few of the links to review the information available. After completing all other sections of this lab, you can return to the Management Agents to further review if time permits and with your instructor's permission.

Settings page

1. Click *Settings* from the primary navigation bar.

Maintenance page

2. Click *Maintenance* to display the following page.
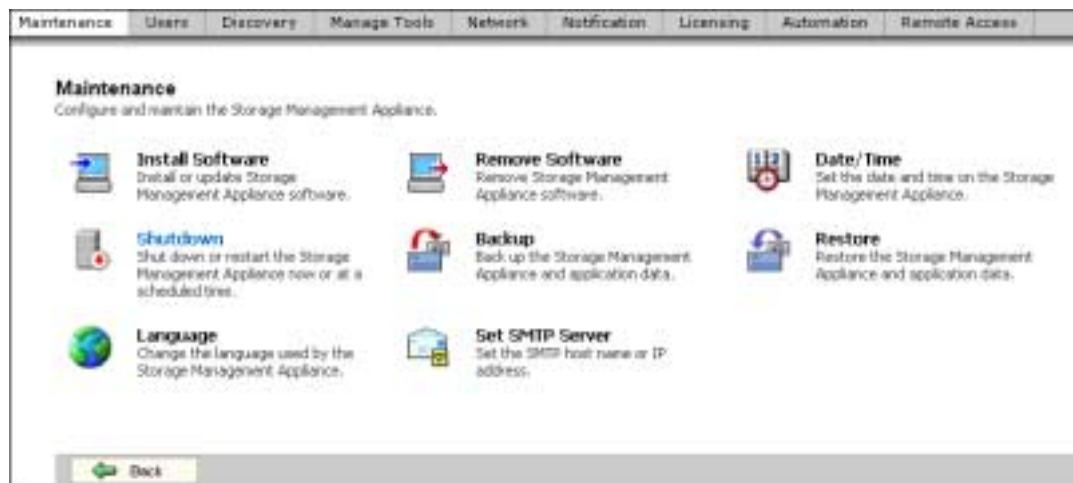
The Install Software option was used during the Install lab to install patches.

3. Click *Remove Software.* If desired, you would select an application and then *Remove* and then follow the instruction prompts. **DO NOT REMOVE ANY APPLICATIONS AT THIS TIME.**

4. Click *Back.*

5. Click *Date/Time.* Update the time if desired. Notice that the Appliance can be synchronized with an SNTP Time Server of your choice at a rate of your choice.

6. Click *OK.*

The Shutdown option will be used later in this lab.

7. Click *Backup.* After the backup wizard displays, click *Next.*

8. Ask your instructor for a network share to which you can backup the Appliance. Obtain the following information:

   \\machinename\sharename:…………………………………………………….

   Domain name: …………………………………………………………………

   User name:…..…………………………………………………………………

   Password: …...…………………………………………………………………

9. Enter the above information and click *Next.* The backup will start and a progress page will display. After the backup completes, click *Finish.*

   Remember that only the Storage Management Appliance database and application data files will be backed up.

10. Click *Restore,* and then *Next* after the restore wizard displays.

11. Fill in the requested information used for the backup and click *Next.*

12. After the confirmation page displays, you would click *Next* to initiate the restore. Since the appliance was just backed up and there is no need for a restore, click *Cancel.*

13. Click *Language.* Depending on the appliance software, you may have only one option. If other options were available, you would select the desired option and *OK* to change the language used on the appliance pages. Click *Cancel.*

14. Click *SMTP Server.* Enter the host name or IP address of a host to designate it as the SMTP mail server. Click *OK.*

Users page

1. Select *Users* to manage the users on this Storage Management Appliance.

2. Select *New* and complete the requested information. If you don't want to use the account immediately, select *Disable this user account*. Click ? on the primary navigation bar and scroll down to determine the differences between the following user privilege levels.

   User: ……………………………………………………………………………

   Operator: ………………………………………………………………………

   Administrator: …………………………………………………………………

3. Click *OK*.

4. Select the user you just created. You can delete, change the password, modify the properties (including disable or change access), and configure event notification.

   > **Note**
   >
   > The Import button is only available when the Management Appliance is part of a domain. Refer to the HP website and the Storage Management Appliance User Guide for procedures on importing users.

5. Explore the different options available for the selected user. When finished, return to the Settings page.

Discovery page

1. Select *Discovery*. After the Create Discovery wizard displays, select *New*. Enter *IP Discovery* and then select *Next*. Enter a short range of IP addresses that includes your host. Enter *public* in the Community strings box and click *Add*. IP ranges can be excluded on the new page that displays. Click *Next*. Click *Finish* if the settings are acceptable.

2. Select *IP Discovery*. Notice that you can delete, modify the properties, or enable the selected discovery. Under properties you can schedule a discovery. Select *Enable*. After the confirmation page displays, select *OK*.

3.   Select *IP Discovery* again. Notice that the Start Discover option is now available and that Disable has replaced Enable.

4.   Select *Start Discovery.* After the confirmation page displays, select *OK*. The Discovery page displays indicating that the IP Discovery is running.

5.   After the discovery is complete, check if your host has been added to Discovered Devices.

     How do you access the discovered devices?

     ……………………………………………………………………………………

     (Answer is at the top of the next page if you have trouble.)

6.   Return to the Settings page.

     (To view discovered devices, select *Devices*, and then *Discovered Devices*).

Manage Tools page

1.   Select Manage Tools. You can view the Storage Management Appliance components and applications along with their versions and states. You can also start, stop, and display the properties of an application and its services for these components and applications. You cannot stop individual services associated with an application.

2.   Select *License Manager* and explore the options for that application.

3.   Select *Back* to return to the Settings page.

Network page

1. Select *Network*. The following page displays.

2. Click *Appliance Name*. The appliance can be renamed to suit your needs; however, there are restrictions to doing so.

⚠ **Caution**
Do not use the Windows Control Panel to rename the Management Appliance. The Management Appliance database can become corrupted and prevent proper assignment of service privileges.

If the Management Appliance is a domain member, the device can only be renamed within the existing domain.

If you have an application installed that is dependent on the Storage Management Appliance name, you cannot change the system name. A message at the bottom of the page tells you if an application is installed that prevents you from changing the Storage Management Appliance name.

The changed Storage Management Appliance name will not display in the list on the Manage Application Password page (Settings → Remote Access) until you run a discovery. You must run the built-in Local SAN discovery to have the new name recognized.

3. Click *Cancel*.

4. Click *Domain Membership*. Select *Domain* and follow the instructions. Note the security warning at the bottom of the displayed page.

5. You would then click OK to complete the action. For this lab, click *Cancel*.

6. Click *Global Settings*. Use this page to:

    •   Specify DNS suffixes

    •   Edit the hosts file

    •   Edit the LMHOSTS file for NETBIOS names.

7. Click *Cancel*.

8. Click *Interfaces*. Use this page to:

    •   Change the name of the connection

    •   Set or change the IP addresses, gateway addresses, subnet masks, and metrics

    •   Set or change how the Management Appliance resolves DNS names

    •   Set or change the configuration of the Windows Internet Naming Service (WINS) clients

9. Click *Back*.

10. Click *Administration Web Site*. Follow the instructions to change the IP addresses and the ports (both encrypted and non-encrypted) that can be used to access the administration website.

11. Click *Cancel*.

12. Click *Telnet*. Select *Enable Telnet access to this appliance* to enable telnet.

13. Click *Cancel*.

14. Click *SNMP Trap Recipients*. Select *New*. On the Create Trap Recipient page enter the host name or IP address of your workstation. Accept the default port number or enter another valid port number. Click *OK*.

15. Select the new trap recipient. You can now delete or modify its properties. Click *Back* to return to the Network page.

Notification page

16. Click *Notification* on the secondary navigation bar.

17. Select *Management Appliance*, and then click *Events*. Scroll down the page, if necessary, to find an event with a Critical severity. (If no Critical events, select a Warning event and lastly, an Information event.) Select that event and click Properties or Configure the same new page displays.

18. On the Notification Properties page, select an Available User and Trap Recipient and click *Add*. Note that a trap recipient can also be created on this page.

19. Scroll down the page and select additional desired options. If you are not a Proactive Remote Service (PRS) customer, selecting the last option is not necessary.

20. Click OK. You are returned to the Notification Events page. Notice that you can configure all or clear all events.

21. Select the event previously configured. Notice there are entries in the Recipient List column and all the tasks are enabled.

22. Click Back to return to the Events page. Notice there are also entries in the Recipient List column.

Licensing page

23. Click *Licensing* on the secondary navigation bar to control the use of application licenses.

24. Click *Applications* to view or change the license server for a registered application's license files. Click *Back*.

25. Click *Features* to view a list of features and an overview of their properties, including version and expiration date. Click *Back*.

26. Click Licenses. Click New to load a new license file. Click *Back*.

27. Click *View Log* to view and download the License log file. Click *Back*.

28. Select a file. You can delete the file or view and modify the file properties. Select *Properties*. If a license expired, you could go to this page to replace the file with a new license. Click *Cancel*.

Automation page

1. Click *Automation* on the secondary navigation bar. A new browser window displays the Automation Manager Policies page.

2. Click *Settings* on the Automation Manager primary navigation bar. Click *Add Hosts*. From the Add Hosts page, select *Add Host Manually*, enter the name of your host, select the proper operating system, and then click *Submit*.

    > **Note**
    >
    > The host and host agent must be added prior to setting a policy for that host. The host will not become operational for Automation Manager until the host agent is added to that host.

3. Click *Agents* on the Automation Manager secondary navigation bar to download Automation Manager agents.

    a. Select an agent based on the operating system of the host on which you want to install the agent

    b. Click *Download Agent* and the Web Browser File Download dialog box appears

    c. Select *Save* to save this program to disk and click *OK* to proceed

    d. Select where you want to save the agent, and then click *Save*

    > **Note**
    >
    > Just prior to taking a break, run the Automation Agent executable--the loading of the agent requires a reboot for a Windows 2000 system.

4. Click *Script* on the Automation Manager secondary navigation bar. Click on a script name to view the information. Click *Close*.

5. Click *Calendar* on the Automation Manager secondary navigation bar.

6. Click *Create* to create a template to pre-set when a process will run. Click *Set Recurrence* to set the option to weekly, monthly or yearly (up to five years). Click *Cancel*. Click on a date button to set that date. Click on the same button to clear that date. Click *Cancel*.

7. Click *Policies* on the Automation Manager primary navigation bar. Click *Add Policy*. In the new browser window, enter a unique policy name and then click *Next*.

8. Select the appropriate host operating system, select *QueryEventLog* and *GetDriveSpaceInfo*, click *Add*, click *Next*.

9. Step 3 allows you to set the order of the selected scripts. In this lab you will query the event log before getting drive space info. So, select *GetDriveSpaceInfo* in the Scripts Dependency box. Notice that the graphical presentation at the bottom of the page changes to indicate the dependency. Click *Next*.

10. Click the circular icon under *QueryEventLog* to configure the script. Accept the entries and click Next.

11. Select the appliance and your host and click *Next*.

12. Use the When Configuration page to determine when the policy runs. Clicking *Create Calendar* functions as described above with the Calendar template. Leave the default settings and click *Finish*.

13. The Step 4 Configuration Legend page will re-display. Notice that the circular icon under *QueryEventLog* now has a white background indicating the script is configured. Click the circular icon under *GetDriveSpaceInfo* to configure that script. Change the Drive Space Percentage Threshold to *90* (with the virtualization of the EVA, higher thresholds can be tolerated). Select the appliance and your host if not already accepted, and then click *Next*. Accept the default entries and click *Finish*.

14. Click *Next* in the top pane of the Configuration Legend page. The Step 5 page displays enabling you to view and print the configuration. Click *Next*.

15. On the Step 6 page, select *Save and Start the Policy*, and then click *Next*.

16. Click *Close* on the Policy Successfully Created page.

17. Return to the Automation Manager Policies page.

18. Select the policy you just created and click *Modify*.

19. In the new window you can modify configurations and add or remove scripts. Select *Modify existing configurations for **'your policy'** Policy*, and then click *Next*.

20. Click the *GetDriveSpaceInfo* icon to re-configure that script. Click *Next*. Click your host, and then Click *Next*. Click *Finish*. Click *Next*. Click *Next*. select *Save and DO NOT Start the Policy*, and then click *Next*. Click *Close*.

21. Return to the Automation Manager Policies page. From that page if you select a policy can delete, stop, start (restart), pause, and continue a paused policy.

22. Select your policy and click *Restart* and observe the status changes.

23. Click on your policy. A graphic display of the policy appears. Click on one of the scripts. Click on the tabs to view the process, host, timing and status.

24. Click *Reports* on the Automation Manager primary navigation bar to generate a status report of each process within all submitted policies. By default, all status types will be selected. Click *Done*, and then *Generate Report*.

25. Click *Help* on the Automation Manager primary navigation bar. A new help window opens.

26. Close the Automation Manager Help and Reports windows.

Remote Access page

1. Return to the Settings page and click *Remote Access.* From this page you enable applications on the Storage Management Appliance to communicate with applications on remote systems.

2. Click *New*. Select your host from the drop-down window. Select *Microsoft Windows* from the drop-down window. Insert the necessary access information. Click *OK*.

3. The new remote access information will appear on the Remote Access page. Select your new entry. The Delete and Properties options are enabled. Click *Properties* and notice that Domain Name, Username and password can be changed. Click *Cancel*.

This completes this lab. Notify your instructor.

The following sections were briefly covered in this lab because they were covered in prerequisite courses. If time permits, you may return to review them.

■ Command View EVA

■ Management Agents

Additionally, if time permits, you may review other sections of this lab or continue to explore the Storage Management Appliance.

HP OpenView Storage Provisioner — Installation
Lab 4.1

Objectives

After completing this lab, students should be able to:

- Install, configure and use HP OpenView Storage Provisioner

Overview

The instructions in this lab guide take you through all the steps necessary to install, configure, and use HP OpenView Storage Provisioner.

Prerequisites

Before installing Storage Provisioner, confirm that the system and software requirements have been met.

System requirements

> **Note**
>
> Refer to the HP Storage Provisioner QuickSpec and Installation Instructions to ensure the latest system and software requirements are met.

- Storage Management Appliance
- HSV-based controller on EVA 3000/5000

OR

- HSG-based controller on MA/RA/ESA/EMA

Software requirements

- Appropriate update to the Storage Management Appliance Software

- Browsers supported by the Storage Management Appliance

- JAVA plug-in

- Appropriate version of Command View EVA for HSV controllers

OR

- Appropriate version of Element Manager for HSG controllers

Installation process

The Storage Provisioner installation process includes:

- Fulfilling the pre-installation requirements.

- Installing the Storage Provisioner software.

- Adding permissions to the *java.policy* file on the local computer accessing the Storage Management Appliance to allow for backing up the database and exporting provisioning data.

Installing Storage Provisioner

1. Log in to the Storage Management Appliance (SMA).

    1. Click *Settings* → *Maintenance* → *Install Software*

    2. On the Welcome to the Installation Wizard page, click *Next*.

Storage Provisioner can be installed using one of three methods:

■   From a CD-ROM drive in the SMA.

■   From an FTP server.

■   From a file on a local disk in the SMA.

This lab will use a CD-ROM as if a customer purchased Storage Provisioner and was sent the software on a CD.

4. Place the Storage Provisioner CD in the CD-ROM drive of the indicated Storage Management Appliance, and then click *Next*.

5. Confirm that Storage Provisioner is selected in the drop-down window, and then click *Next*.

    The installation will begin. A progress page will display.

    After the installation is complete (approximately 2 to 5 minutes), the following will display:

    > Installation is complete.
    >
    > Storage Provisioner - Installation Complete.
    >
    > Storage Management Appliance will restart after you select **Finish**.

6. Click *Finish*.

7. Log in again to the SMA.

    To verify a successful installation, click *Tools*. If storage provisoner displays, the installation was successful.

Creating the provisioning environment

1. Launch Storage Provisioner from the Tools page of the SMA by clicking *storage provisioner*.

    If prompted, accept the download of the Java applet. If the Internet is not available in the lab, a Java Plug-in Security Warning may persist, close it and Storage Provisioner should open if a Java Plug-in is already loaded. If not ask your instructor where to obtain the plug-in.

2. If no storage is displayed, click *Discover*. Discovery may take a few minutes.

3. A pop-up box will display indicating the results of the discovery. Click OK.

    The discovered storage systems will display under Unmanaged Storage Systems.

4. Click the *Utility* button on the toolbar to move the storage systems for management by Storage Provisioner.

Note
Click the Help icon in the Session pane for assistance during the lab.

5. In the new dialog window, enter a utility name and select the storage type from the pull-down list.
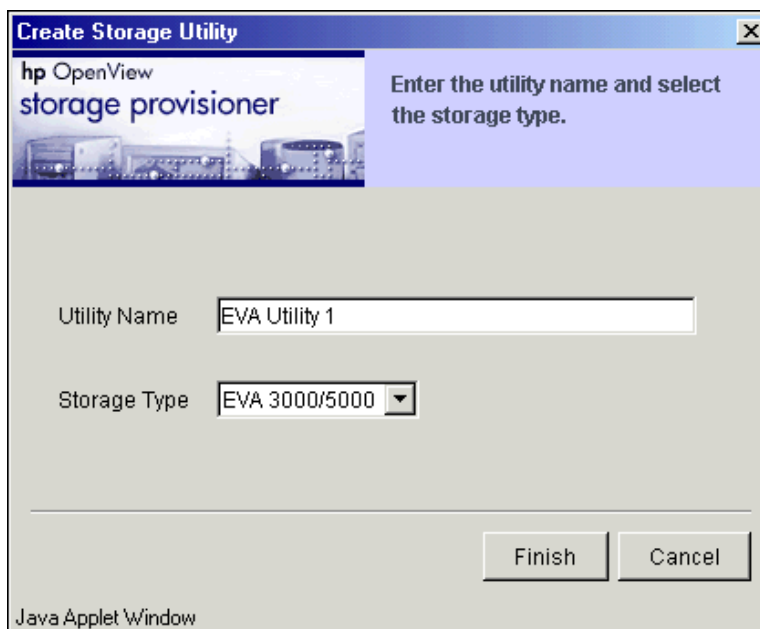
6. To assign a storage system to a utility, the storage system must first be modified. Select an Unmanaged Storage System, and then click *Modify* on the toolbar.

7. A Modify Storage System dialog box displays with the name of the Storage System. Click *Next*.

8. Another Modify Storage System dialog box displays showing existing utilities and an Unmanaged Storage Systems item.

9. Select *EVA Utility 1* and click *Finish*.

    Notice the now-managed storage system displays in the Navigation pane under its utility.

    Details of the selected system are displayed in the Content pane.

10. Click *Customer* on the toolbar. The Create Customer dialog box displays.

11. Enter the customer information and click Next.

    The Existing Customer Groups window displays.

    If a group or groups had been entered previously (by clicking the Group button), this new customer could be placed in a group by selecting that group.

    Groups can be created later and customers can then be moved to those groups.

12. Since no groups exist, click Finish.

13. Create other customers as desired.

14. You will now set a quota. Hold down the Shift key and select both a storage utility and a customer.

    The selected items are highlighted.

15. Click Quotas on the toolbar. Enter 100 GB (or less if 100 GB exceeds your available storage), and then click Next.

16. Enter 5 hosts and 20 volumes. Click Finish.

17. Select the Service Levels tab and then Create to set storage attributes.

18. Enter a name, description (optional) and storage type, and then click Next.

19. Select a protection level, a copy option, the backup option (optional), and enter a cost per GB (optional).

    The backup option merely identifies that the volumes are to be assigned for backup.

20. Click Finish.

21. Create additional Service Levels as desired.

Provisioning

You are now ready to provision the storage and allow your customer to provision their storage.

You will now access Storage Provisioner as a customer would.

1. Open a new web browser.

2. Determine the IP address of the Storage Management Appliance.

    How can you obtain the IP address of the SMA using the SMA features?

    (One solution is at the bottom of the page.)

    ……………………………………………………………………………………

    SMA IP Address: .   .   .   .

3. Browse to http://x.x.x.x:7777, where x.x.x.x is the IP address of the Storage Management Appliance. The HP OpenView Storage Provisioner for Storage Consumers launch page displays

4. Click *storage provisioner*. The login page displays in a new window.

5. Enter the username and password of one of your customers.

    Doc TeamA's username and password was *teama* and *teama.*

6. Click Login.

    Storage Provisioner for Consumers opens displaying the customer's current total storage quota and unused quota in a graphical representation.

(To find the IP address of the SMA: Click *Settings → Network → Interfaces*. The IP address is listed in the IP column for the Local Area Connection.)

7. Click the Manage Storage tab, and then the Host button.
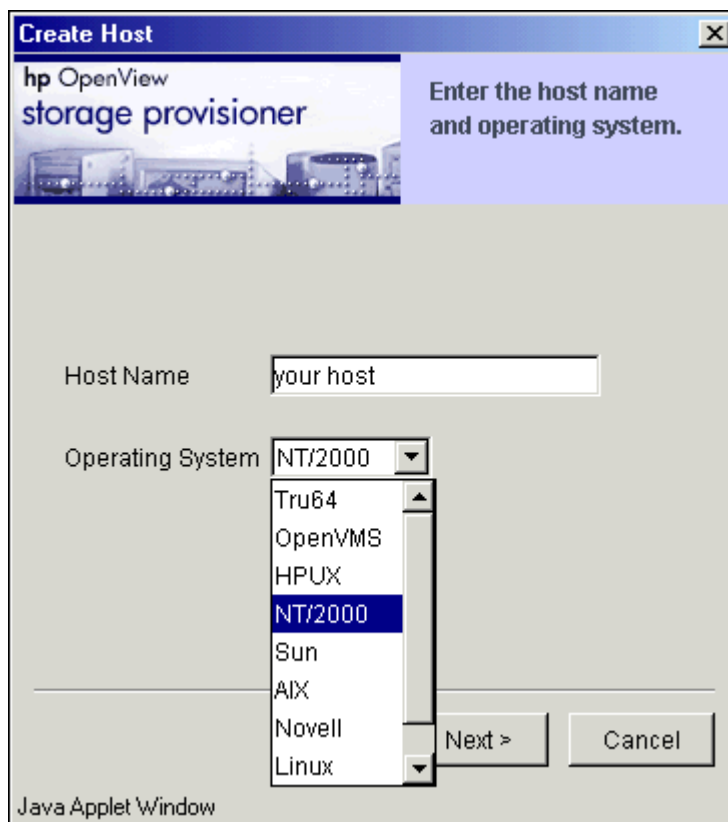
8. Enter the name of your host, select the proper operating system and then click *Next*.

    The hosts groups page displays.

    You can define host groups to help you manage large numbers of hosts.

9. Click *Finish*.

10. Select your host, and then click *Path*.

11. Enter the path name, and then click *Next*.

12. Select a utility, and then click *Next*.

   If you do not know the port Id for the host entered above, open Command View EVA or HSG Element Manager and access the appropriate host port.

   Host port ID: …………………………………………………………………….

13. Click Add. Enter the port ID, click OK and then click *Finish*.

   Add additional ports as desired.

Volumes

14. Select a path in the Navigation window, and then click the V*olume* button.

15. Complete the window options, and then click Next.

   The volume group page displays.

   You can define volume groups to help you manage large numbers of volumes.

16. Click *Finish*.

   Add additional volumes as desired.

17. Select a volume. The Access button becomes active.

18. Click *Access* on the toolbar.

19. Select the desired host paths from the displayed list.

20. Click Finish.

   Note
   You as a storage provider can accomplish the same tasks as the customer.

21. Activate your previous Storage Provisioner window.

   The top of the page should list the SMA name instead of its IP address.

22. Select the Provisioning tab and select a customer.

   More options are available to the storage provider than to the customer.

Reporting

Viewing Reports

1. Return to the customer Storage Provisioner window.

2. Click the Reports tab.

3. Click *View Volumes* to view the Current Volume Usage Report.

4. Click *Close*.

5. Click *View Quota* to view the Quota Report.

6. Click *Close*.

7. In the Volume Usage box, enter a start and end date.

8. Click *View History* to view the Usage History Report for that period.

Exporting Reports

9. Click Export.

   The following message will display:
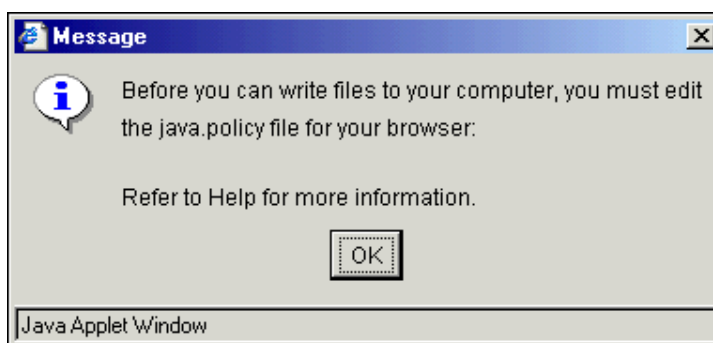
Editing the java.policy file and exporting a report is OPTIONAL. Skip the next two steps at this time. If you would like to complete these tasks later and time permits, return to these steps after completing the remaining tasks of this lab.

10. To edit the java.policy file, complete the following steps:

    a. On the hard drive of each computer used to browse to the SMA, locate your java.policy file by using the search or find function.

    b. Open the file.

    c. Find the following grant line at near the top of the file:

       grant {permission java.security.AllPermission;};

d. Edit the grant file of the java.policy file to look like this:

grant {permission java.security.AllPermission;};//Standard extensions get all permissions by default grant codeBase "file:${java.home}/lib/ext/*"{permission java.security.AllPermission;;//default permissions granted to all domains

e. Save the modified java.policy file.

11. Return to Storage Provisioner browser and click *Export.*

The Save Quota Report window opens.

Select a folder, enter a file name, and click *Save.*

Your report information is now ready to print. Refer to the student guide or the Storage Provisioner User Guide for print procedures.

> **Note**
> You as a storage provider can accomplish the same tasks as the customer by using the Usage Reports tab.

Maintaining Storage Provisioner

Maintenance of Storage Provisioner includes backup up your Storage Provisioner configuration data to a file on your local system; restoring that configuration data; and viewing, exporting and printing diagnostic logs.

You perform these maintenance tasks using the Storage Provisioner *Admin* tab.

1. Return to the browser for the storage provider.

The browser heading lists the appliance name instead of its IP address.

2. Click the Admin tab.

3. In the Diagnostic logs box, click *View.*

4. In the new window, click the drop-down list to view the types of logs available.

The export option for the logs functions the same as the export function for reports.

5. Click Close.

Refer to the student guide or the Storage Provisioner User Guide for backup or restore procedures.

The backup and restore procedures also will not function properly until the java.policy file is modified.

This completes the lab. Notify your instructor.

If desired and time permitting, return to the Exporting Reports section above.

HP OpenView Business Copy EVA – Installation
Lab 5.1

Objectives

After completing this lab, students should be able:

■   Install HP StorageWorks Business Copy EVA server and host agents.

Overview

The instructions in this lab guide take you through all the steps necessary to install HP StorageWorks Business Copy EVA with Microsoft Windows 2000.

Prerequisites

■   Storage Management Appliance with supported version of the Storage Management Appliance software installed

■   Storage Management Appliance with supported version of the storage element manager software installed

■   Client servers with Microsoft Windows 2000 (SP2 or later) installed

■   Microsoft Internet Explorer (IE) 5.5 or later installed

■   An appropriate Java Runtime Environment (JRE) plug-in installed to fully interact with the BC EVA graphical user interface (GUI)

> **Note**
> The BC server automatically detects browser settings and provides JRE plug-in downloads for several types of browsing platforms.

■   BC server software

■   BC agent software.

BC server installation

1. Browse to the Storage Management Appliance and login.

2. Check for an appropriate version of the SMA software and the storage device manager.

    Command View EVA and HSG Element Manager are device managers.

    Try to access the appropriate SMA page. If unable, check at the bottom of the page for directions.

3. Check with your instructor for the medium that contains the BC software.

    Location of share software: …………………………………………………….

4. Install the BC server software on the SMA.

    Try to access the appropriate SMA page. If unable, check at the bottom of the page for directions.

5. After the install is complete, ensure the software has been loaded by accessing the Tools page. Business copy should now be displayed on the page.

To check SMA software: click *Settings* → *Manage Tools*

To install software on the SMA: click *Settings* → *Maintenance* → *Install Software* → *Next* → select the appropriate location of the application setup file → *Next* → then follow the instructions provided by the wizard.

BC host agent installation

6. Insert the BC Host Agent CD into the CDROM drive of your server. The installation initial setup displays.

   If initial setup screen is not displayed from My Computer, double-click on your CD-ROM drive and find the s*etup.exe* file and open that file to initiate the setup program.

   If you are installing BC from a network share, map a drive letter to the share on which the BC software is located. Use Windows explorer to access BC on that mapped drive and double-click on s*etup.exe*.
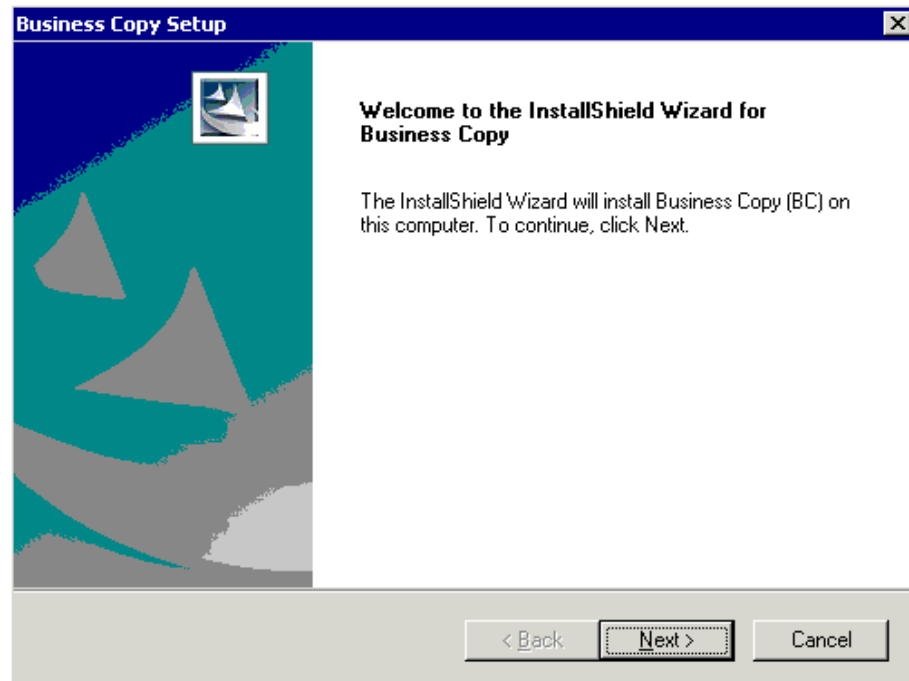
7. Click *Next* to begin the installation.

8. Review the information on what is required for a successful BC installation. Ensure that you have met the requirements and click *Next* to continue.

9. Click *Yes* to acknowledge that the preinstallation requirements have been met.

10. Click *Yes* to accept the License Agreement.

11. Accept the default destination, and click *Next*.
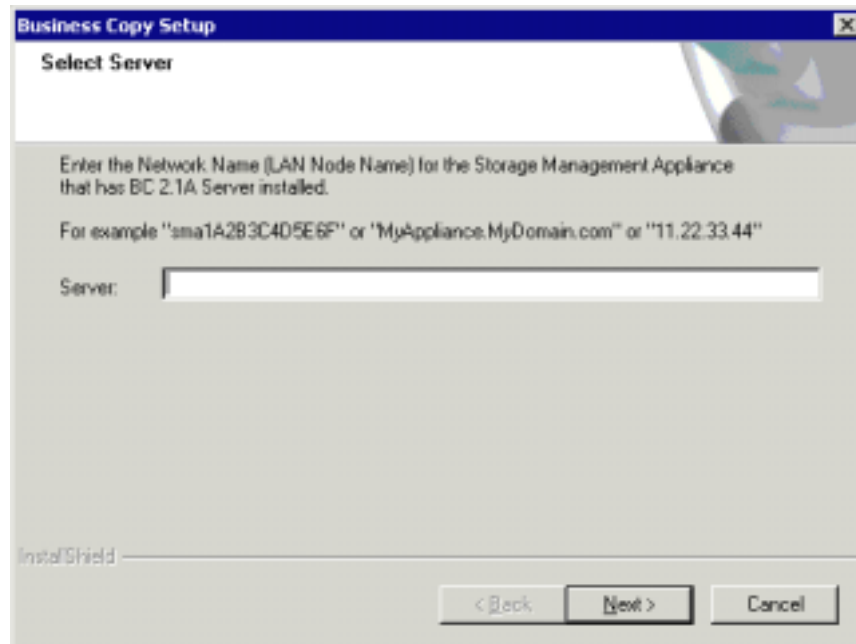
Note

For the BC server to communicate with the BC host each BC host must be able to resolve the network name of the Storage Management Appliance (BC server) and the Storage Management Appliance must be able to resolve the network names for each of the BC hosts.

12. Enter the name of the Storage Management Appliance on which the BC server is installed then click *Next*.

A ping to the named SMA occurs. If communication with this appliance is not established, a confirmation question displays.
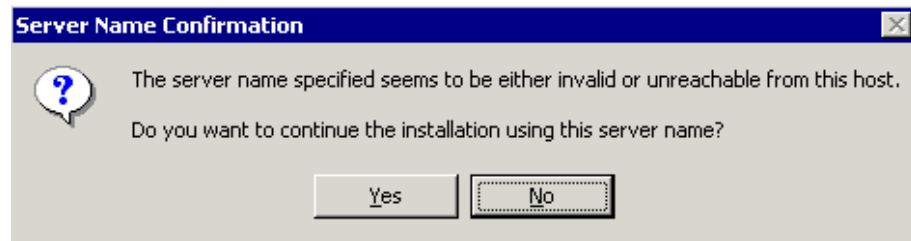
Select *No*. Re-check the name of the SMA and re-enter SMA name properly. If network problems prevent pinging of the SMA or its name has been changed, you may enter the SMA name later. Continue with the next step.

13. If the name of the SMA has been entered correctly and is reachable from your host, the Select Options window displays.
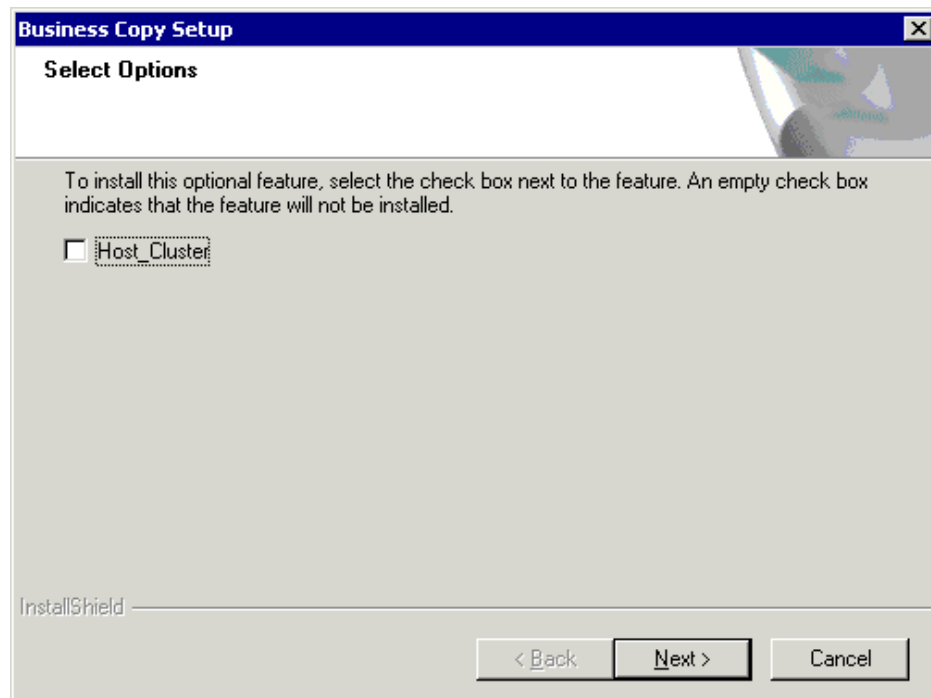
14. DO NOT select the option to install host cluster support.

Note

Install host cluster support only in clusters that use the MSCS. Only one cluster node needs the host cluster support enabled during BC installation. Enabling this feature on a noncluster node has no impact on BC functionality.

For standalone hosts being added to a cluster environment at a later date, the BC host agent must be reinstalled to add BC cluster functionality.

---

15. Click *Next.* The installation wizard completes the installation.
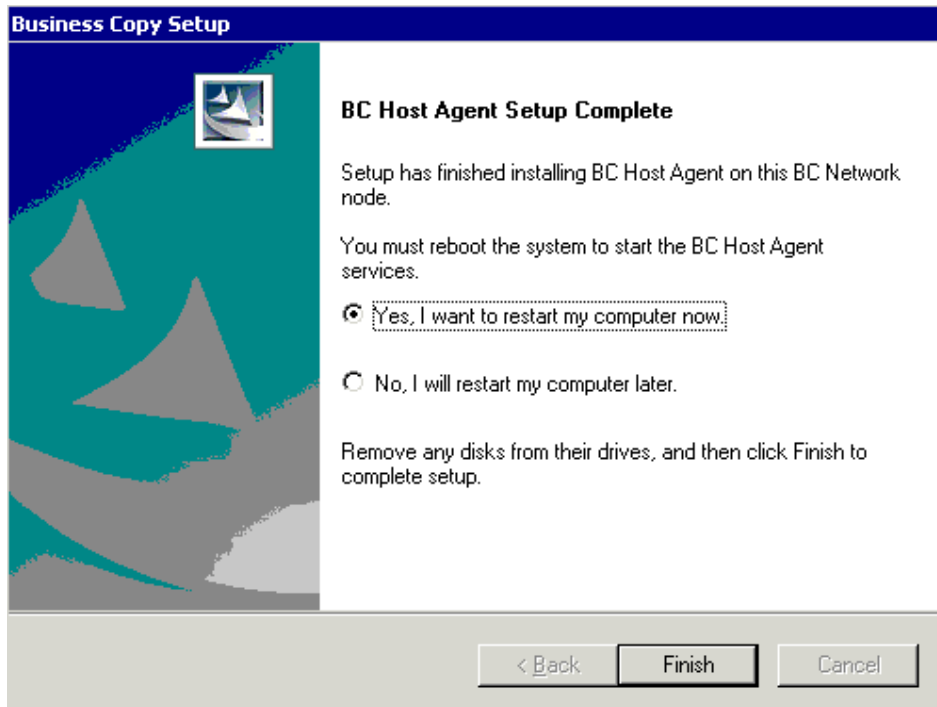
16. Leave the *Yes, I want to restart my computer now* option selected and click *Finish* to complete the installation and restart your computer.

Note

The host computer must be restarted before the BC host agent software takes effect and the BC service on this computer is started.

Do not remove the BC host agent CD-ROM from the CD drive until the restart completes and you have logged back in to the host computer to finish the installation.

You have finished the BC EVA installation

Continue with the next lab

HP StorageWorksBusiness Copy EVA — Operation
Lab 5.2

Objectives

After completing this lab, students will be able to perform the following tasks:

- Create a job that performs a snapshot operation and automatically mount the snapshot on a host.

- Create a job that performs a snapclone operation and mounts the snapclone on a host.

Overview

In a business environment, two uses for HP StorageWorks Business Copy EVA are to:

- Create a snapshot of production data and invoke a backup handler to use that snapshot to perform a backup.

- Create of snapclone of your production data and enable the use of the data in the snapclone for your data mining application, minimizing the effect of those queries on daily operations.

The purpose of the lab is to give you some experience using Business Copy EVA (BC EVA) to perform those tasks. You will:

- In exercise one you will:

  - Create an execute a BC snapshot job to:

    - Make a snapshot of your production data (includes quiescing and restarting any necessary applications – if necessary).

    - Mount the unit on your backup server.

    - Verify that the snapshot and mount are successful.

  - Run the associated undo and verify that it was successful.

- In exercise two create and execute a BC snapclone job to:

  - Copy your production volume (includes quiescing and restarting any necessary applications – if necessary).

  - Mount the unit on your data-mining server.

  - Verify that the unit is mounted successfully.

Prerequisites

- Microsoft Windows 2000 Server installed on one computer which will serve as the host

  - Service Pack 2 installed

  - MSIE 5.50 or greater installed

  - BC host agent installed

- BC server installed on the HP OpenView Storage Management Appliance.

- HSV or HSG80-based storage configured as follows:

  - A Vraid1 or mirrorset.

  - The above volume identified by a Windows 2000 host, formatted NTFS, and assigned drive letter F:

  △ **Caution**
  BC does not support Windows Dynamic Disks. BCVs can be created from source units configured as Dynamic disks, but attempting to mount these BCVs will result in job failure.

Exercise 1 — Create a snapshot

In a normal business environment, a BC job would create a snapshot after quiescing any running applications, restart the application, mount the snapshot on the backup server, and then initiate the backup. In the interest of time, this exercise performs the quiesce, snapshot, restart, and mount, but does not actually initiate a backup.

1.   Browse to your Storage Management Appliance and login.

2.   Click *Settings* → *Tools* → *business copy*. Business Copy should open in a new browser window displaying the Jobs page.
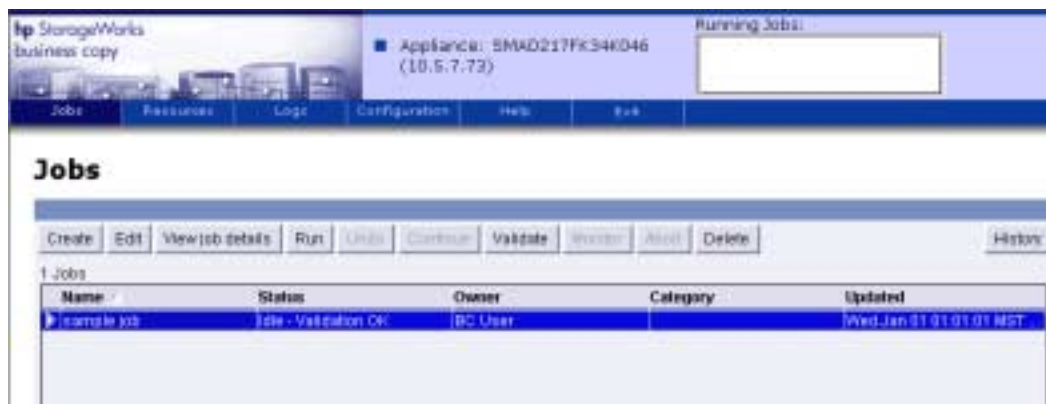
3.   Click *Resources*. The host on which you loaded the host agent and the storage subsystems in your SMA environment should be displayed in the navigation pane.

     If these systems are not displayed, click *Refresh All Subsystems, Refresh Subsystem,* or *Refresh Host* as appropriate. Using the appropriate refresh button saves time during discovery especially in a large SAN.

4.   Click your host and expand the tree to display the drives available to that host.

5.   Click a storage subsystem to display the volumes associated with that subsystem.

6.   Return to the Job page by clicking *Jobs* on the BC primary navigation bar.

Note

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7. Select *sample job* and then click *View job details*.

   For similar operations, you can usually right-click the entry and select the option or double-click the entry. Explore the different options during this lab.

8. Click *Run.* In the session pane, the sample job will be running.

9. Return to the Jobs page. Select *sample job.* The Run option is not available; however, the Undo option is available. Click *Undo.*

10. Return to the Jobs page. Right-click *sample job* and then select *Run*.

11. Select *Logs* from the primary navigation pane.

12. Select *job_sample job_1.txt* and click *Show* (or double-click the file) to view the log information from the last running of the sample job.

    Notice that the most recent running of a job is appended with "..._1.txt" so that the last running is listed on top.

13. Close the Logs window.

14. On the Jobs page, click *Create*.

15. Click *Select A Job Template*.

16. Select *snap one unit mount*.

17. Enter *SnapshotXX* as the Job Name (where *XX* is your class station number). Enter Owner and Category as desired.

18. Right-click the Snap Unit step in Step/Sequence column and select *Edit.*.
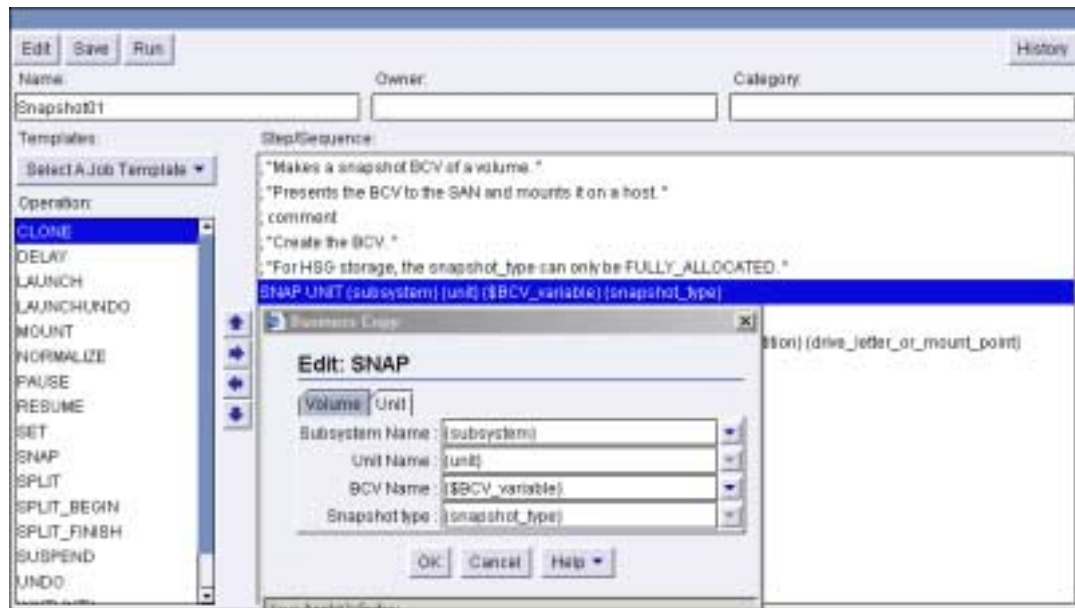
19. Select the *Unit* tab.

20. Click the drop-down arrow beside the Subsystem Name to display the available subsystems.
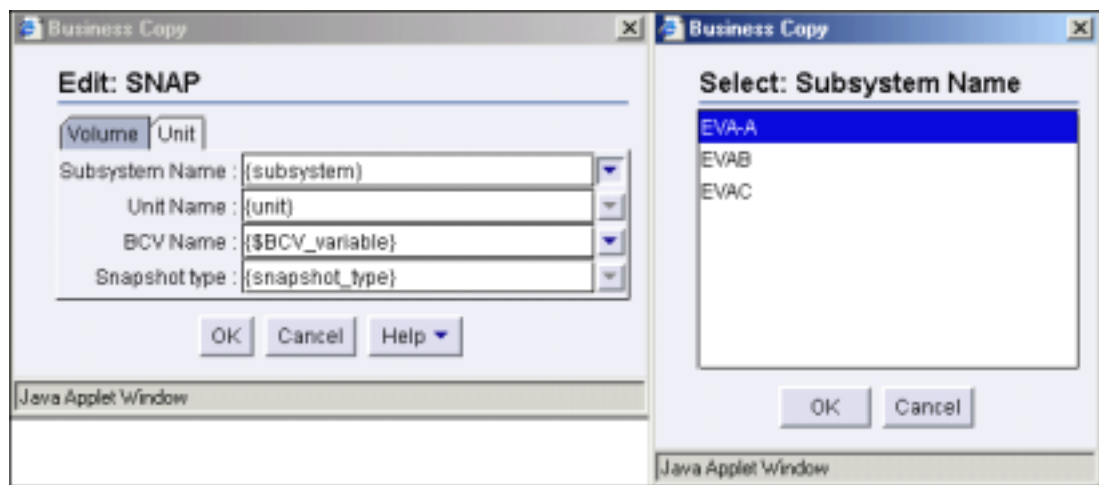
21. Select a subsystem and then click *OK*.

22. Click the drop-down arrow beside the Unit Name to display the units available on that subsystem. Select an available unit and then click *OK*.

23. On the Edit Snap window, click *Help* and select *Windows 2000.*

    The SNAP UNIT operation help window opens. Click the *$BCV variable* link to display a separate $BCV variable help window.

24. Return to the Job Create page and double-click the BCV Name entry and enter *$Snap1* as the BCV name.

25. Click the drop-down arrow beside the Snapshot type to display the snapshot types for that subsystem. Select *DEMAND_ALLOCATED_HSV,* and then click *OK.*

26. Click *OK* in the Edit Snap window. Your entries are displayed for that step in the Step/Sequence column.

27. Click the *Save* button.

Note

In the BC GUI, the browser session will time out after 15 minutes of inactivity. At that point, you'll have to log in again. Therefore, when creating jobs or making changes on the Configuration page where an explicit 'Save' is required, make sure you are saving often. Under certain circumstances, the SMA software expiration may also reset the connection between the browser and the BC GUI. If the "Running Jobs" window displays the message Refresh Browser, the connection has been reset and any information not saved before the reset will be lost.

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28. Double-click the MOUNT UNIT step in the Step/Sequence column.
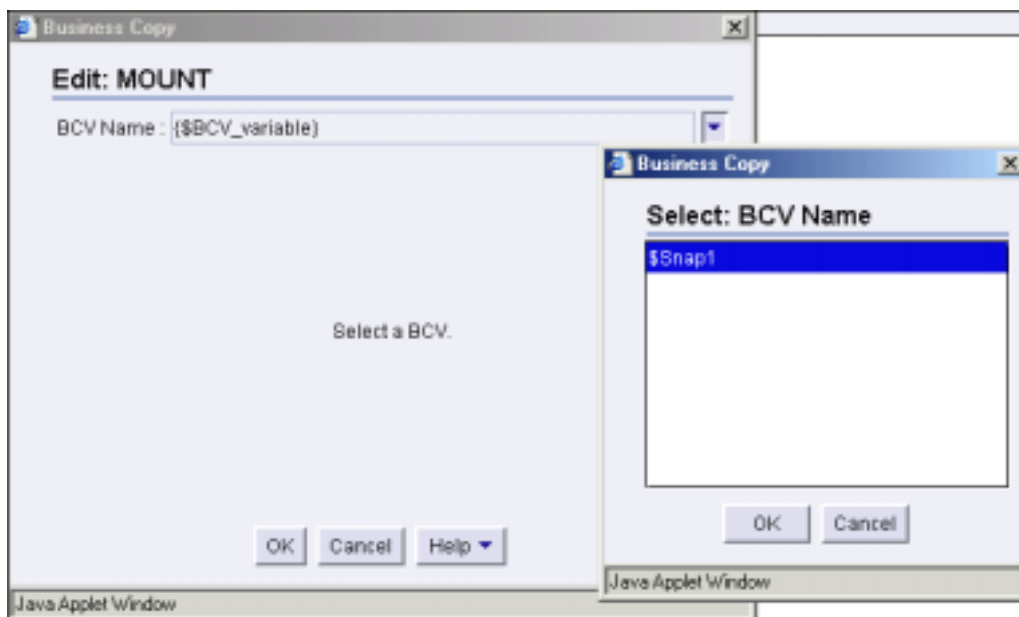
29. Click the drop-down arrow beside the BCV Name to display the BCVs available. Select *$Snap1,* and then click *OK.*

30. Click in the BCV component box and enter *1* (number one) to mount the BCV as partition one.

31. Click the drop-down arrow beside the Destination Host Name, select your host, and then click *OK.*

32. Select *Mount BCV component as a file system.*

33. Click in the Drive Letter or Mount Point box, enter *g:* (include the colon) to mount the BCV as drive letter G, and then click *OK.*

34. Click OK in the Edit: MOUNT window.

35. Click the *Save* button.

36. After *Request (saveJob) is complete* displays at the top of the Job Create window, click *Jobs* on the primary navigation pane.

37. Select *SnapshotXX* and click *Validate.* Ensure the status window indicates *Validation OK*.

     If your job did not validate, click *Logs* and open the appropriate log to determine the cause. Correct the problem. Re-validate your job. Continue these steps until the validation is successful.

38. Select your job and select *Run*.

     What entry is displayed under Running Jobs in the title pane?

     ....
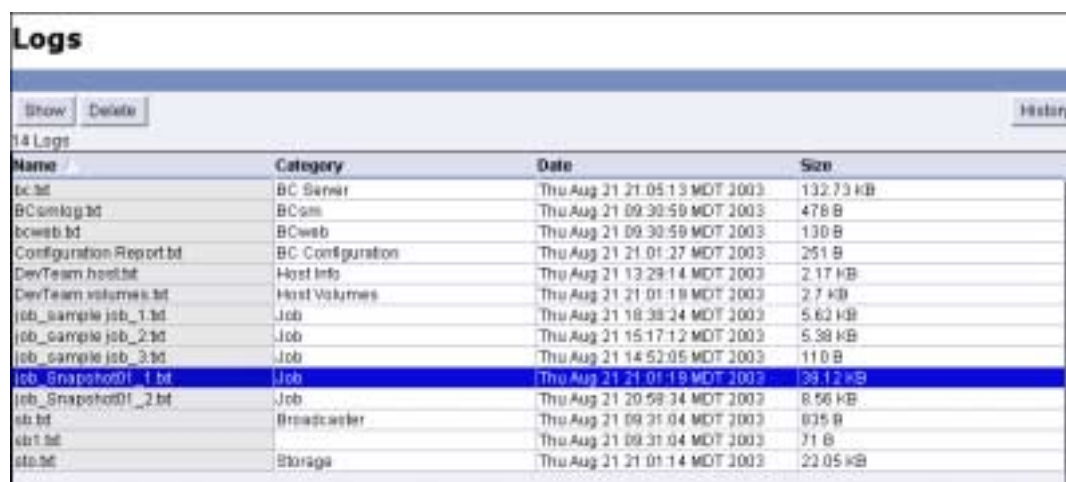
     What is the Job Status for your job?

     ....

39. Select your job and select *Monitor*.
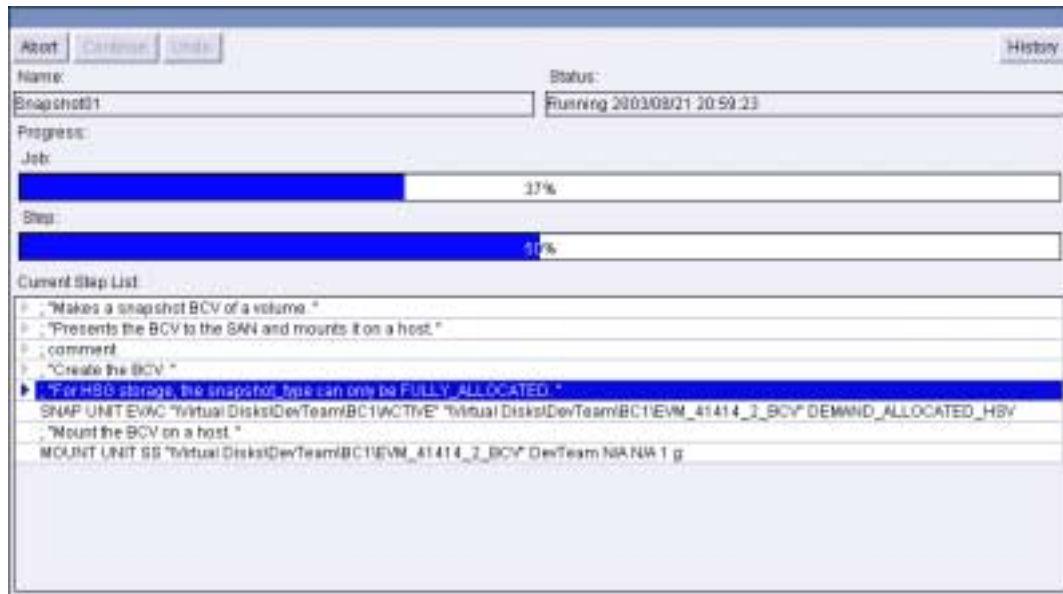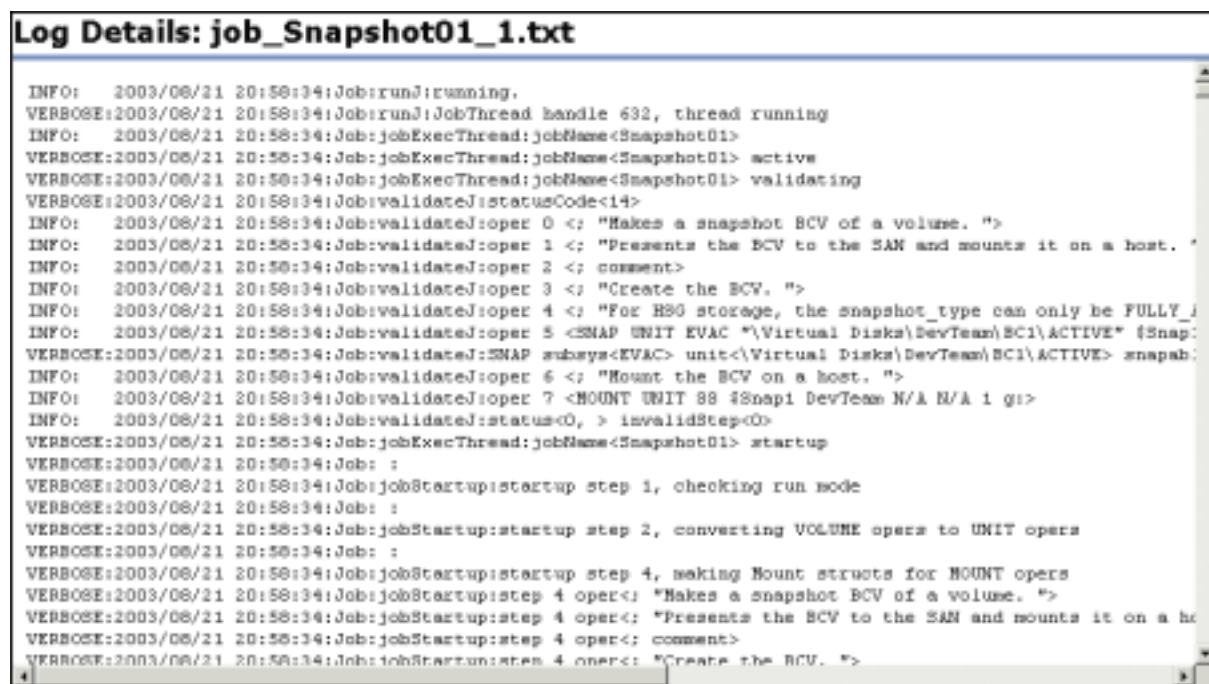
40. When the job is complete, click *Jobs* to return to the list of available jobs.

41. Select *Logs* from the primary navigation bar.

42. Select the first text file for your job (example: job_SnapshotXX_1.txt) and
view the list of operations that were executed when the job was run.

43. On your server, right-click on *My Computer* and select *Manage*.

44. Right-click on *Storage → Disk Management*.

45. Verify that you are able to see the BCV disk G (or the drive letter used in the snapshot operation) mounted on that server.

    If the BCV cannot be seen, select *Rescan.*

46. Return to the Jobs page.

47. Select *your job* and click *Undo* to release the resources used in the snapshot.

Note

If you select the *Undo* operation as a part of the job, the Undo operation is appended to the job and you will not see BCV drive mounted on the server.


When the undo process completes this lab exercise is completed

Continue with the next exercise

Exercise 2 — Create a snapclone

In a normal business environment, a BC job would create a snapclone after quiescing any running applications, restart the application, and then mount the snapclone on the data-mining application server while the snapclone is normalizing in the background. In the interest of time, this exercise performs the, snapclone and mount, but will not actually quiesce and restart the application on the data-mining application server.

1. Select the Jobs page and then click *Create*.

2. Select *MOUNT* and then click the right arrow to add the Mount operation to the Steps/Sequence column.
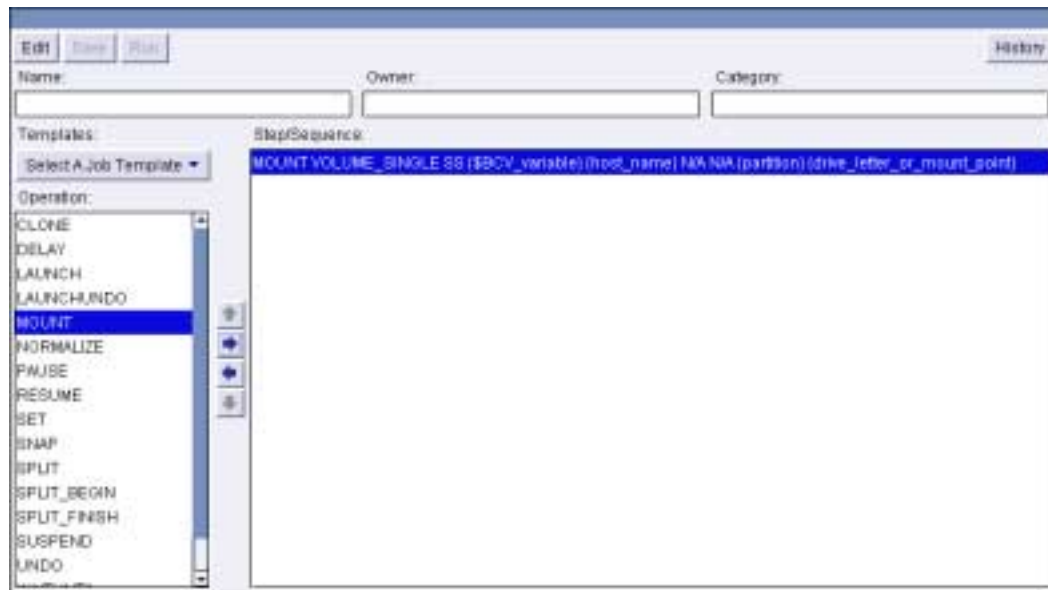
3. Select *SNAP* and then click the right arrow to add the Snap operation to the Steps/Sequence column.

4. With the Snap operation still selected, click the up arrow to move the Snap operation up in the sequence.

5. Enter *SnapcloneXX* as the Job Name (where *XX* is your class station number).

6. Select the *SNAP* operation in the Step/Sequence column and then click *Edit.*

7. Select the *Volume* tab.

8. Click the drop-down arrow beside the Host Name to display the available hosts. Select your host or your second host if one is available, and then click *OK.*

9. Click the drop-down arrow beside the Drive Letter or Mount Point box, select F, and then click *OK.*

10. Click the drop-down arrow beside the BCV Name, select *$BCV2*, and then click *OK.*

11. Click the drop-down arrow beside the Snapshot type to display the snapshot types for that subsystem. Select *SNAPCLONE_HSV,* and then click *OK.*

12. Click *OK* in the Edit Snap window. Your entries are displayed for that step in the Step/Sequence column.

13. Click the *Save* button.

14. Double-click the MOUNT UNIT step in the Step/Sequence column.

15. Click the drop-down arrow beside the BCV Name to display the BCVs available. Select *$BCV2,* and then click *OK.*

16. Select the Single tab.

    Select the All tab if mounting more than one BCV and the following options would apply to all the BCVs.

17. Click the drop-down arrow beside the BCV component box, select *F*, and click *OK.*

18. Click the drop-down arrow beside the Destination Host Name, select your host, and then click *OK.*

19. Select *Mount BCV component as a file system,* enter *G:* in the Drive Letter or Mount Point box, and then click *OK.*

20. Click OK in the Edit: MOUNT window.

21. Click the *Save* button.

22. After *Request (saveJob) is complete* displays at the top of the Job Create window, click *Jobs* on the primary navigation pane.

23. Select *SnapcloneXX* and click *Validate.* Ensure the status window indicates *Validation OK*.

     If your job did not validate, click *Logs* and open the appropriate log to determine the cause. Correct the problem. Re-validate your job. Continue these steps until the validation is successful.

24. Select your job and select *Run*.

25. Select your job and select *Monitor*.

26. When the job is complete, click *Jobs* to return to the list of available jobs.

     If your job did not complete successfully, select *Logs* from the primary navigation bar. Select the first text file for your job and view the list of operations that were executed when the job was run to see what caused the problem.

     Undo your job, make the appropriate changes to your job, re-validate your job and re-run your job. After the job is successful, continue with the next step.

27. On your data-mining application server, right-click on *My Computer* and select *Manage*.

28. Right-click on *Storage → Disk Management* to verify that you are able to see the disk G (or the drive letter used in the snapclone operation) mounted on that server.

29. Return to the Jobs page.

30. Select *your job* and click *Undo* to release the resources used in the snapclone.
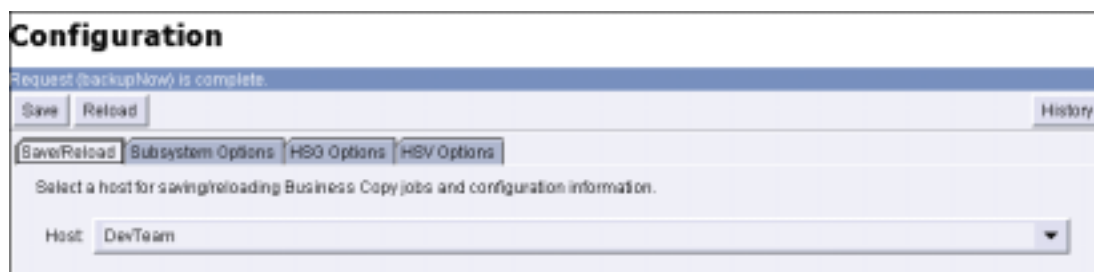
Exercise 3 — Configuration page

Configuration information

1. On the primary navigation bar, click *Configuration*.

2. Click *Help* on the primary navigation bar.
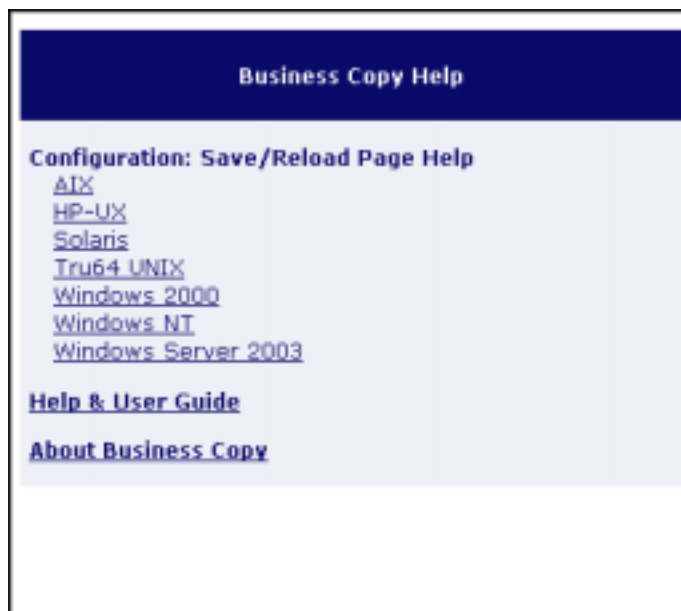
3. Select Windows 2000 if you want to view the *Configuration: Save/Reload Page Help* or select *Help & User Guide* or *select About Business Copy.*

4. Select the *Save/Reload* tab.

5. Click the drop-down arrow besides Host. Select the BC-enabled host to which you want to save the BC configuration and job files.

6. Click *Save*.

    After a change in the Storage Management Appliance, as an example, click *Reload* to restore the BC configuration and job files.

7. Click the *Subsystems Options* tab, select the refresh interval and deselect subsystems that do not need to be managed by BC.

    Both can help your refresh times.

8. Click the *HSG Options* tab. HP recommends you leave the option selected to improve the likelihood of successful replications.

9. Click the *HSV Options* tab and select the desired option.

10. Click *History* to view the page history.

11. Close the Message History window and all Help windows.

12. Click *Exit* from the primary navigation bar and click *OK* in the Exit Business Copy confirmation window.

This completes this portion of the lab exercise

Please let your instructor know that you are finished