



## CompTIA A+ Lab Series v2

### Lab 7: Disk Maintenance and Data Recovery

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## Introduction

This lab is part of a series of lab exercises designed to supplement coursework and provide students with a hands-on training experience based on real world applications. This series of lab exercises is intended to support courseware for CompTIA A+® certification.

Proper disk maintenance is just as important as virus scanning. Just as a virus can destroy data, so can bad disk and data management. Most maintenance can be scheduled to automatically run, so the technician only needs to check periodically to make sure the maintenance procedures are running properly. Data recovery is extremely expensive and proper maintenance can help lessen the likelihood of costly hardware failures.

This lab includes the following tasks:

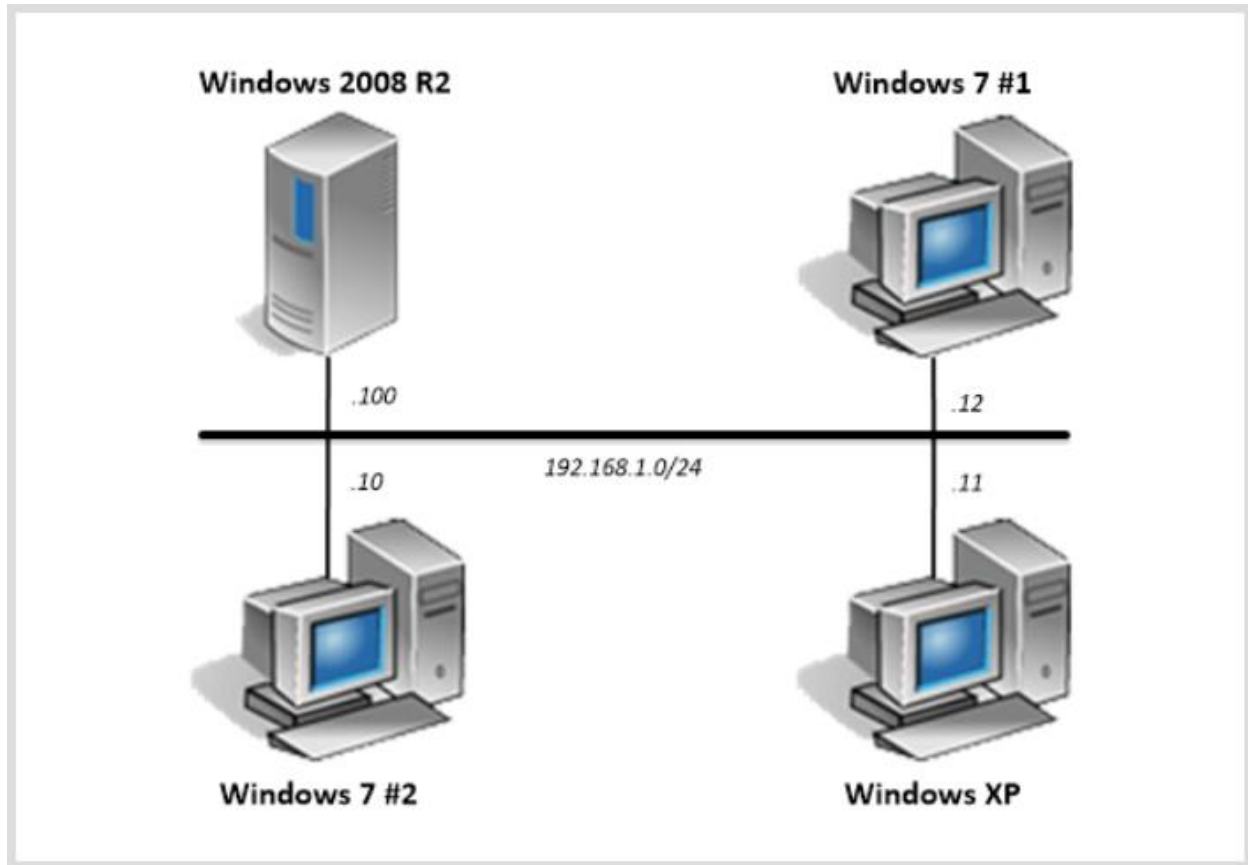
1. Disk Maintenance
2. Data Backup
3. Data Recovery

## Objective: Understanding Maintenance

Preparing for disaster is important, but performing routine maintenance tasks on PCs that you support is just as important. This is to keep them functioning at optimal levels and protected in case of damage or hardware failure.



## Lab Topology



## Lab Settings

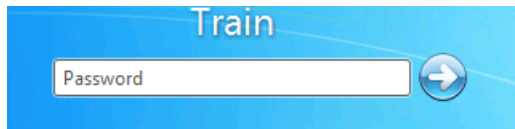
The following table includes settings necessary to complete the lab. The Windows features referenced and used in this lab are consistent with those included with Windows 7.

Log in to the following virtual machines before starting the tasks in this lab:

Virtual Machine	IP Address	Account (if needed)	Password (if needed)
Windows 7 #1	192.168.1.12/24	Train	Train1ng\$
Windows 7 #2	192.168.1.10/24	Train	Train1ng\$

### Windows Login (applies to all Windows machines)

1. Click on the icon on the topology that corresponds to the machine you wish to log into.
2. Use the PC menu in the NETLAB+ Remote PC Viewer to send a **Ctrl-Alt-Del** (version 2 viewer), or click the **Send Ctrl-Alt-Del** link in the bottom right corner of the viewer window (version 1 viewer).
3. In the password text box, type **Train1ng\$** and press **Enter** to log in.



You are using the Train account, which has administrator privileges, to complete the tasks in this lab. You must be an administrator or have administrator privileges to complete some of the tasks in this lab.

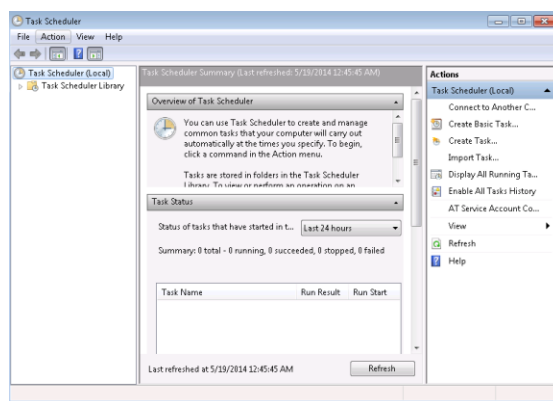
## 1 Cleaning Hard Disk Drives

The Windows operating system needs hard drive space for normal operation. Having unnecessary files stored on the drive takes up space and clutters the hard drive. Many programs add temporary files that are no longer needed. Internet surfing can also result in temporary files accumulating on a system. Using tools to remove these files is a good practice. Removing the files can also cause a situation called disk fragmentation which can increase read/write times on a hard drive effecting performance. Fragmented drives can also hinder data recovery in some situations. Defragmenting is recommended as part of a good maintenance plan.

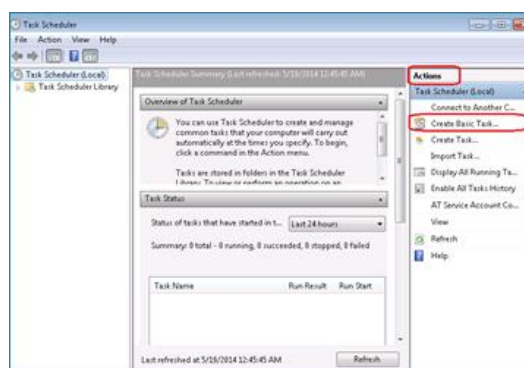
Some newer computers are equipped with Solid State Disks (SSDs) that do not require defragmenting. As these hard drives do not contain moving parts, defragmenting does not improve performance and can adversely affect the lifespan of the drive by adding unneeded reads and writes. However, it is still recommended to remove temporary and unnecessary files.

### 1.1 Disk Cleanup

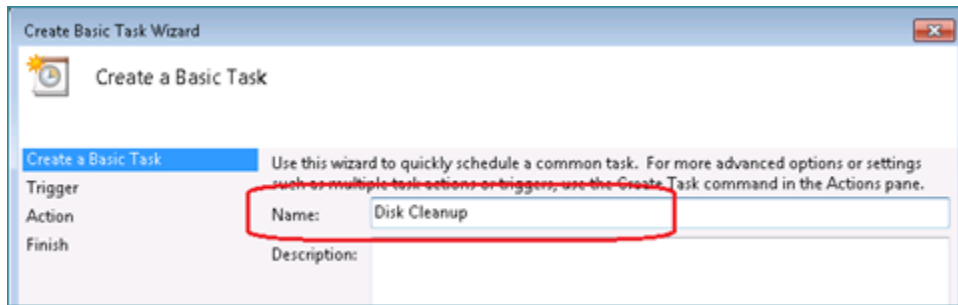
1. Use the instructions in the Lab Settings section to log on to the Windows 7 #1 machine, if you are not logged in already.
2. Click **Start->Control Panel->System and Security->Administrative Tools**. Double-click **Task Scheduler** to open the Task Scheduler window.



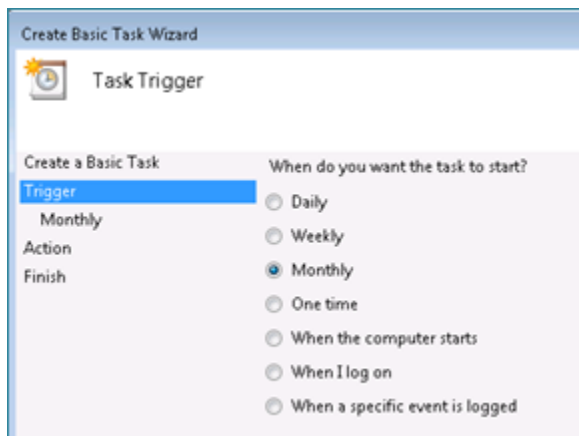
3. Click **Create Basic Task** in the Actions area to open the Create Basic Task Wizard.



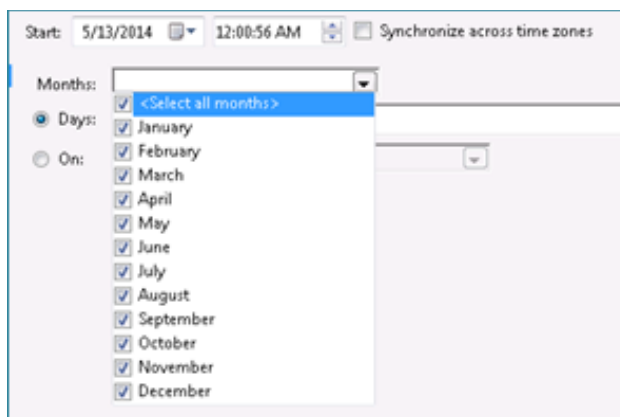
4. Type **Disk Cleanup** in the Name text area.
5. Click **Next**.



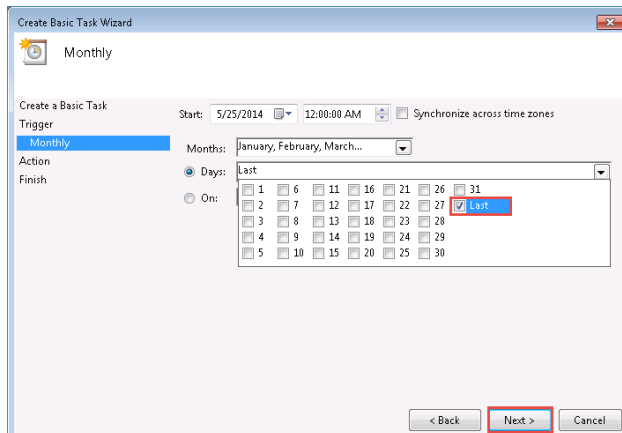
6. Select the **Monthly** radio button.
7. Click **Next**.



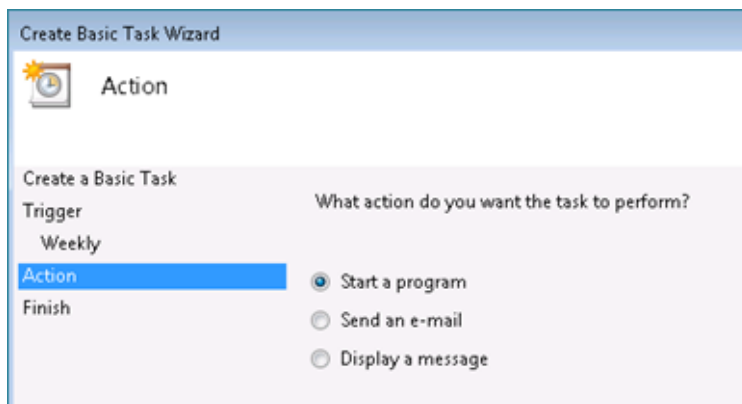
8. Click on the time field and select the hour, minute, seconds, and AM/PM. Use the scroll arrows in the set the time to **12:00:00 AM**. Leave the start date at default.
9. Click the drop down arrow next to **Months** and put a check in the box next to **<Select all months>**. Click the arrow to close the **Months** drop-down.



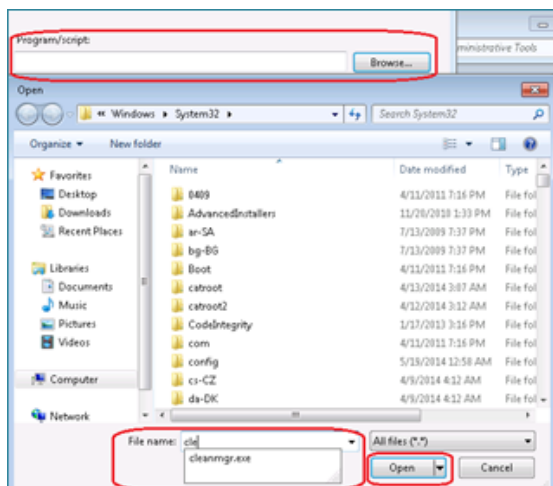
- Click the drop-down arrow next to **Days** and put a check in the box next to **<Last>**. Click the arrow to close the **Days** drop-down. Click **Next**.



- On the Action page, make sure the radio button next to **Start a program** is selected.

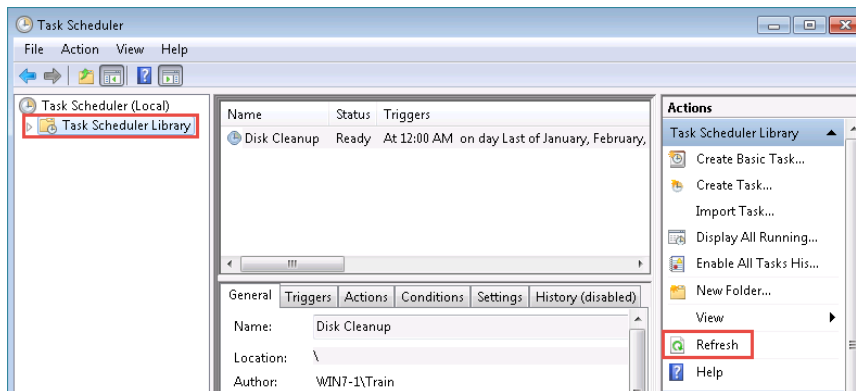


- Click **Next** to open the **Start a Program** window.
- Click **Browse** and start typing the program name for Disk Cleanup, **cleanmgr.exe** in the filename box.
- The filename will auto-fill, click on **cleanmgr.exe** then click **Open**.

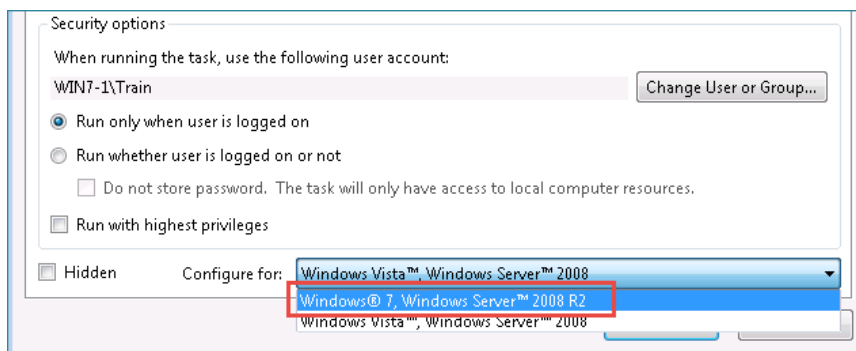




15. Click **Next**. Click **Finish**.
16. In the left pane, click on **Task Scheduler Library** when the Task Scheduler window opens.
17. Click **Refresh** in the **Actions** menu to see the Disk Cleanup task listed in middle pane.



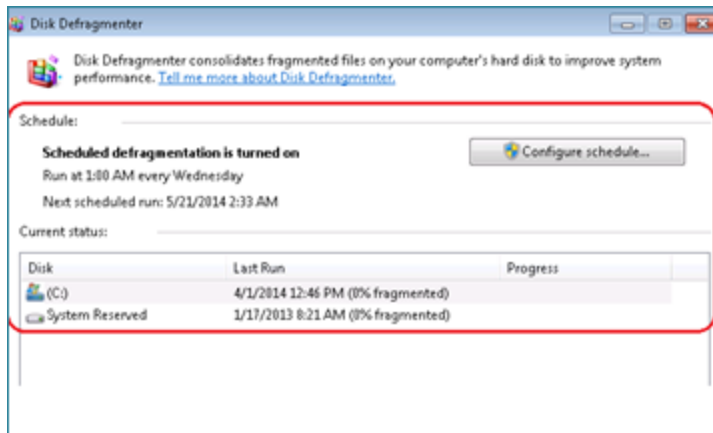
18. Highlight **Disk Cleanup** in the middle pane and click on **Properties** in the right pane.
19. On the **Disk Cleanup Properties** window in the **Configure for:** drop-down menu, select **Windows 7, Windows Server 2008 R2**.



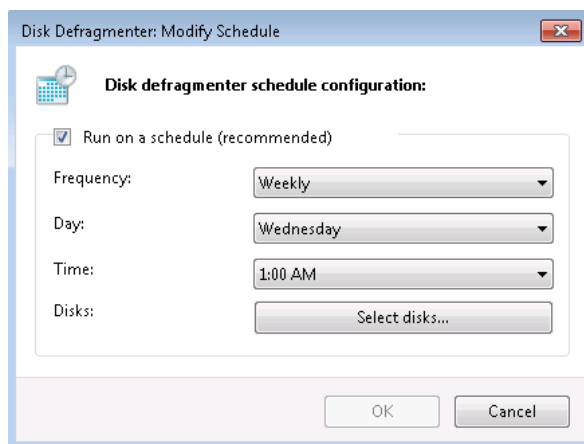
20. Click **OK** to close the Properties window.
21. Close **Task Scheduler** by clicking the "X" in the upper-right corner.
22. Close the remaining windows by clicking the "X" in the upper-right corner.

## 1.2 Disk Defragmentation

1. Use the instructions in the Lab Settings section to log on to the Windows 7 #1 machine, if you are not logged in already.
2. Go to **Start->All Programs->Accessories->System Tools->Disk Defragmenter**.



Disk Defragmenter rearranges fragmented data on a volume (such as a hard disk or a storage device) so it will work more efficiently. In Windows 7, Disk Defragmenter runs at regular intervals when your computer is turned on, so you don't have to remember to run it, but can easily be configured to meet a user or organization's needs by clicking on the **Configure Schedule** button and using the **Modify Schedule** sheet.

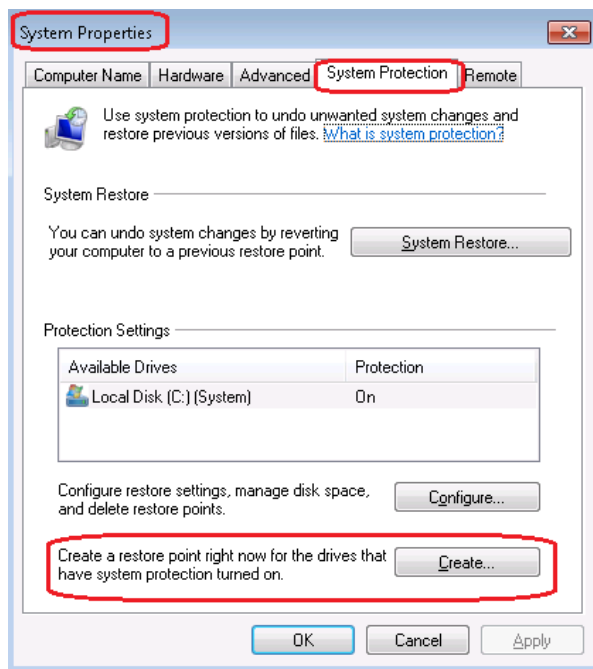


3. Click **Cancel**, click **Close**

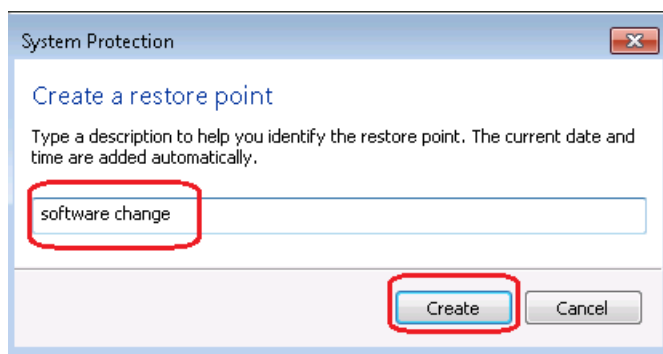
## 2 Creating Restore Points

System Restore allows the user to revert their computer's state (including system files, installed applications, Windows Registry, and system settings) to that of a previous point in time and it can be used to recover from system malfunctions or other problems.

1. Use the instructions in the **Lab Settings** section to log on to the Windows 7 #1 machine, if you are not logged in already.
2. Click **Start**, type **create a restore point** and press **Enter** to open **System Properties** on the **System Protection** tab.
3. Click the **Create** button.

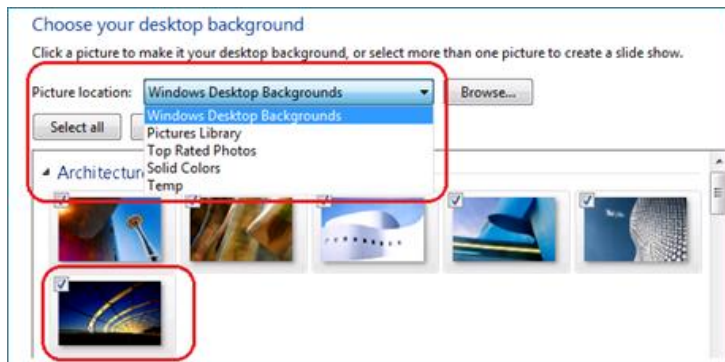


4. Type **software change** in the description box and click **Create**.
5. Click **Close** when the restore point has finished being created.

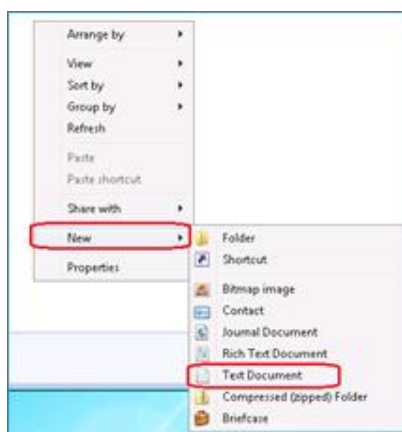


6. Click **OK** on the **System Properties** window.
7. Right-click the desktop and click **Personalize**.
8. Click the **Desktop Background** link.

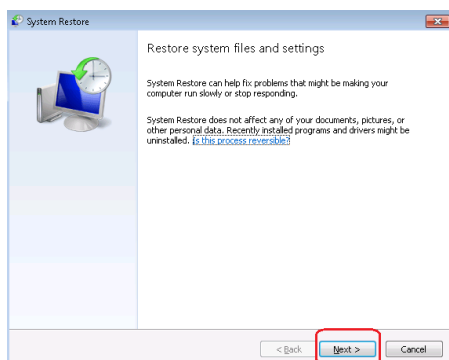
9. Click the **Picture location** drop-down list arrow and click **Windows Desktop Backgrounds**.
10. Make sure that some backgrounds have a check mark next to them and click **Save changes**.



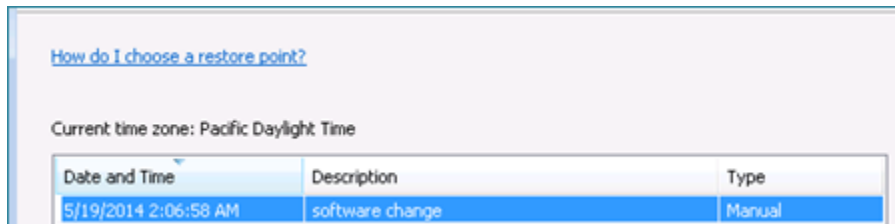
11. Close the **Personalization** window and notice that the background has changed.
12. Click **Start**, and then click **Documents**.
13. Right-click an empty space in the **Documents** library, point to **New**, and click **Text Document**.



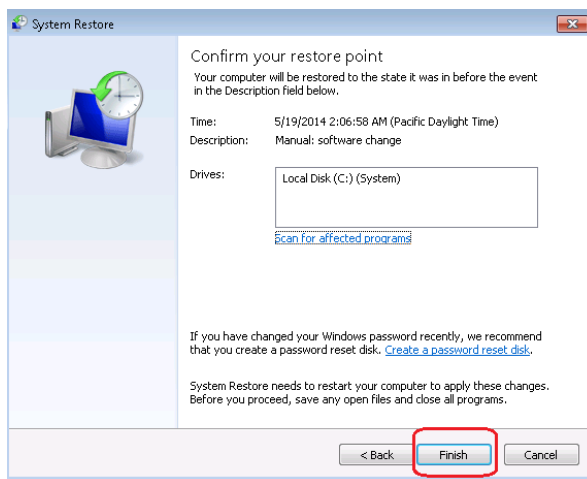
14. Type the name of the file **My System Restore** and press **Enter**.
15. Click the **Start** button, type **system restore** and press **Enter**.
16. Click **Next**.



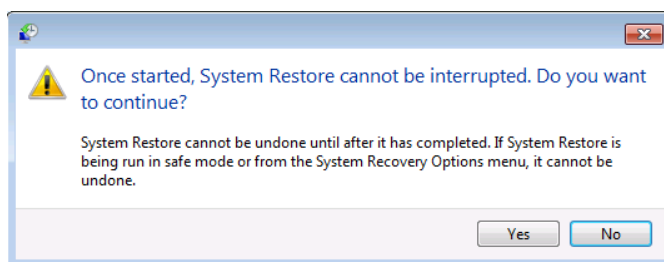
17. Be sure that you have the restore point with the description, **software change** highlighted.



18. Click **Next**.  
19. Click **Finish**.



20. Click **Yes** to start the system restore.



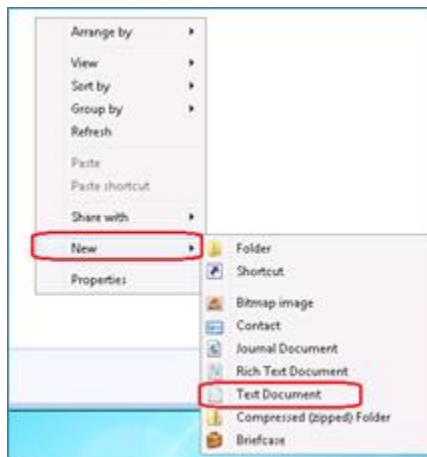
21. Wait for the computer to reboot and log back on.  
22. Notice that the desktop has reverted back to a solid color and a **System Restore** window has opened to tell you the restore was successful.  
23. Click **Close**.  
24. Locate the **My System Restore** file in your My Documents folder.

### 3 Backing up and Restoring Data

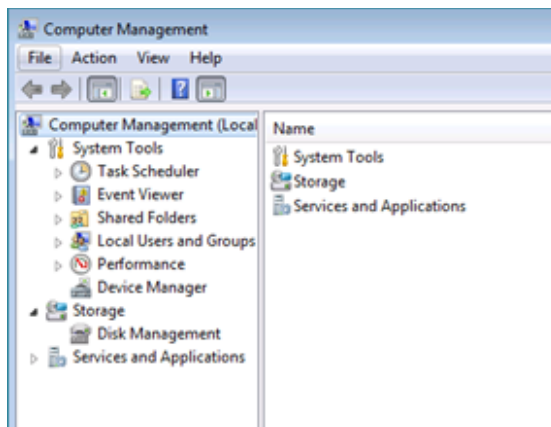
To help ensure that your data is not lost, it should be backed up regularly. Backups can be automatic backups or manually backed up files. A backup is an extra copy of data or other software files that can be used in case the originals are lost or corrupted.

#### 3.1 Protecting your data

1. Use the instructions in the Lab Settings section to log on to the Windows 7 #1 machine, if you are not logged in already.
2. Go to **Start->Documents**.
3. Right-click an empty space on the **Documents** library, point to **New**, and click **Text Document**.

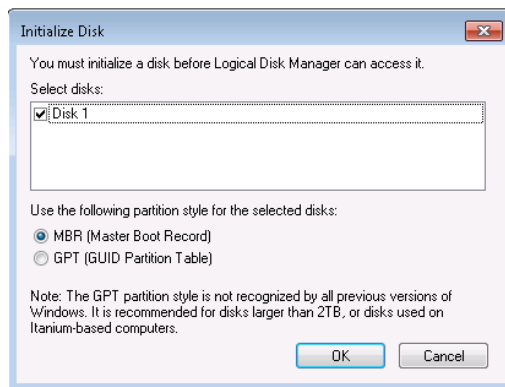


4. Type the name of the file as **My Backup1** and press **Enter**.
5. Open the file and type the text, "**This is my backup**". Close notepad, click **Save**.
6. Repeat the process and create a second text file and name it **My Backup2**.
7. Open the file and type the text "**This is not my backup**". Close notepad, click **Save**.
8. Click **Start->right-click Computer** click->**Manage** to open **Computer Management**.



9. In the left pane, click **Disk Management**.

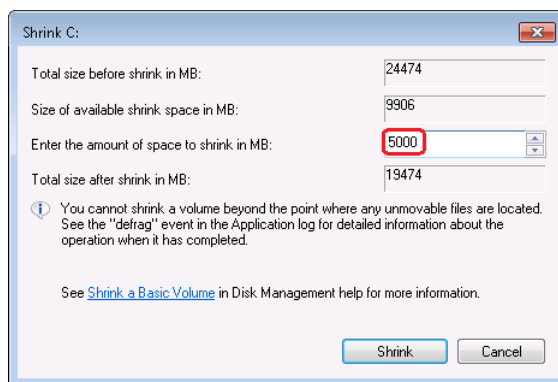
10. Click **OK** to initialize the disk.



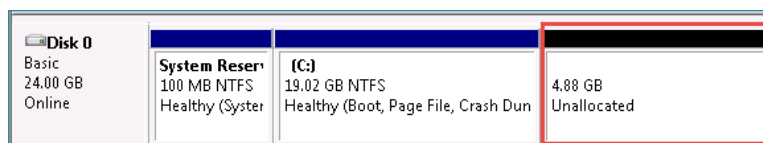
11. Right-click on **(C:)** and click on **Shrink volume** this will create a drive to back up the data to because there is no removable media available for the VM.

12. In **Enter the amount of space to shrink in MB**, type **5000**.

13. Click **Shrink** to allow Windows to calculate how much free space is on the **(C:) drive** that it can partition.

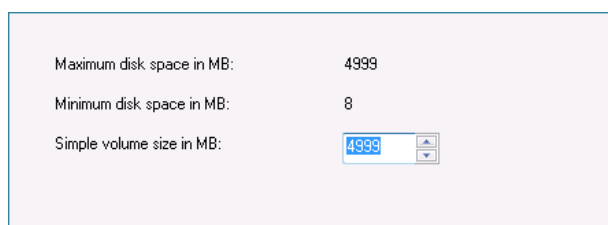


14. Right-click on the new **Unallocated** space and click **New Simple Volume** to open the **New Simple Volume** wizard.

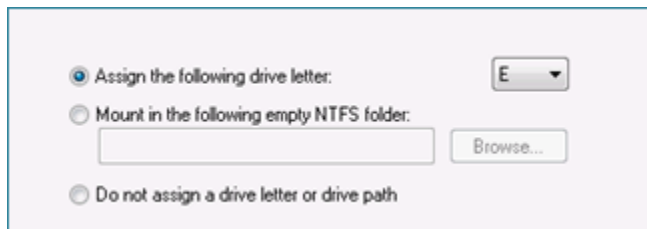


15. Click **Next**

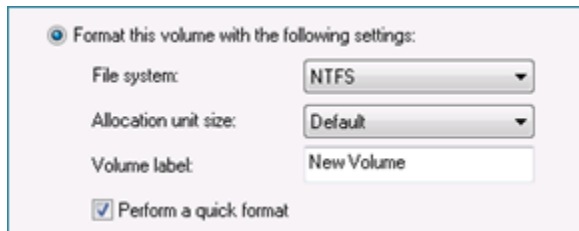
16. Click **Next** to accept the space.



17. Click **Next** to assign a drive letter.



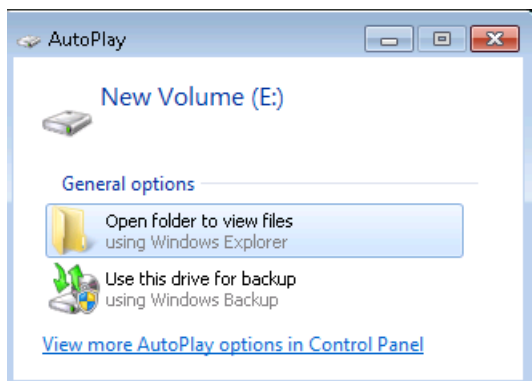
18. Click **Next** to format the volume with NTFS file system.



19. Click **Finish** to create the volume.

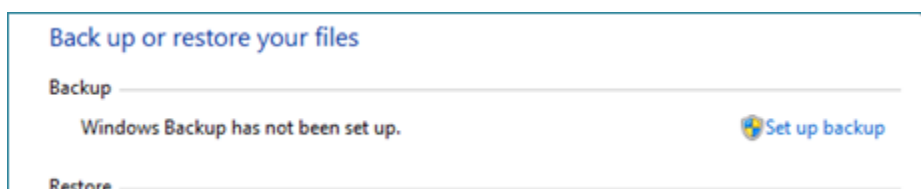
20. Close the **Computer Management** window.

21. Click the "X" in the upper-right corner to close the **New Volume** window.



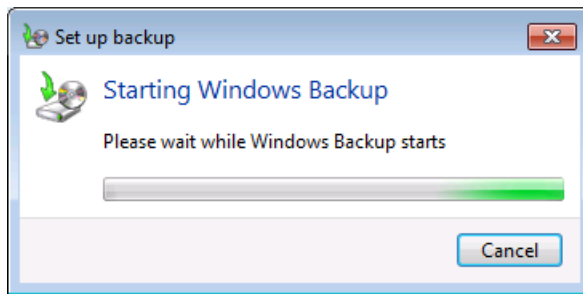
22. Click **Start->All Programs->Maintenance->Backup and Restore**. The **Back up or restore your files** window appears.

23. Click **Set up backup**.



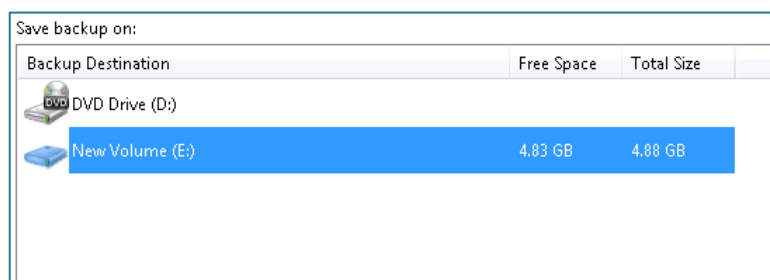


24. Observe that Windows Backup starts to run.



25. Click on **New Volume (E:)** to select the location where the backup will be stored.

26. Click **Next**.

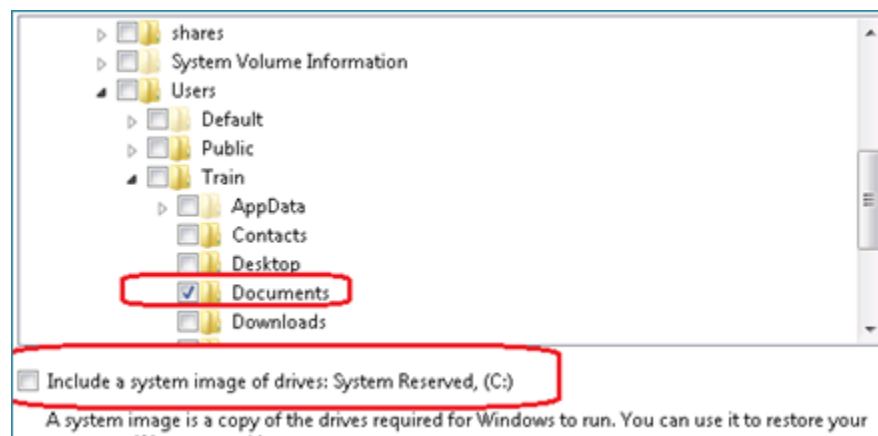


27. Select **Let me choose** on the **What do you want to back up?** window. Click **Next**.

28. Click the arrow next to **Computer->Local Disk (C:)->User->Train** and put a check in the checkbox next to **Documents**.

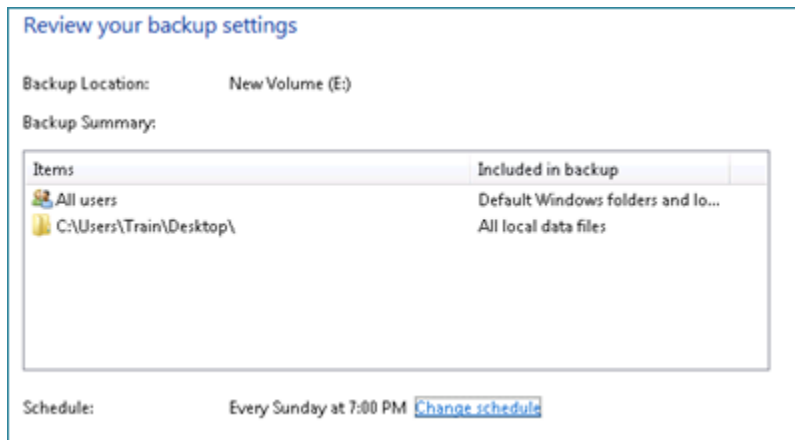
29. Remove the check marks from **Back up data for newly created users**, and **Train's Libraries**

30. Remove the check mark from **Include a system image of drives:**



31. Click **Next**.

32. Click **Change schedule** on the **Review your backup settings** window.



33. Place a check mark in the checkbox **Run backup on a schedule (recommended)**.

34. Use the drop-down arrow to select How often: **Daily**

35. Use the drop-down arrow to select What day: **blank**

36. Use the drop-down arrow to select What time: **3:00 AM**

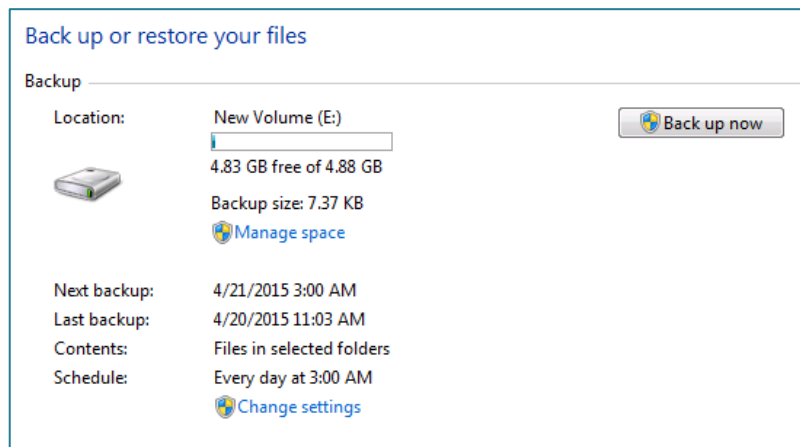
37. Click **OK**.

38. You are returned to the **Review your backup settings** window.

39. Click the **Save settings and run backup** button.

40. The computer will now perform a backup based on the settings entered, regardless of the scheduled time.

41. When the backup is finished, the **Backup and Restore** window appears. Note when the backup will take place and the previously finished backup.



42. It is not necessary to do so now, but you may also click **Back up now** on the Backup and Restore page at any time to start a backup before its scheduled time.

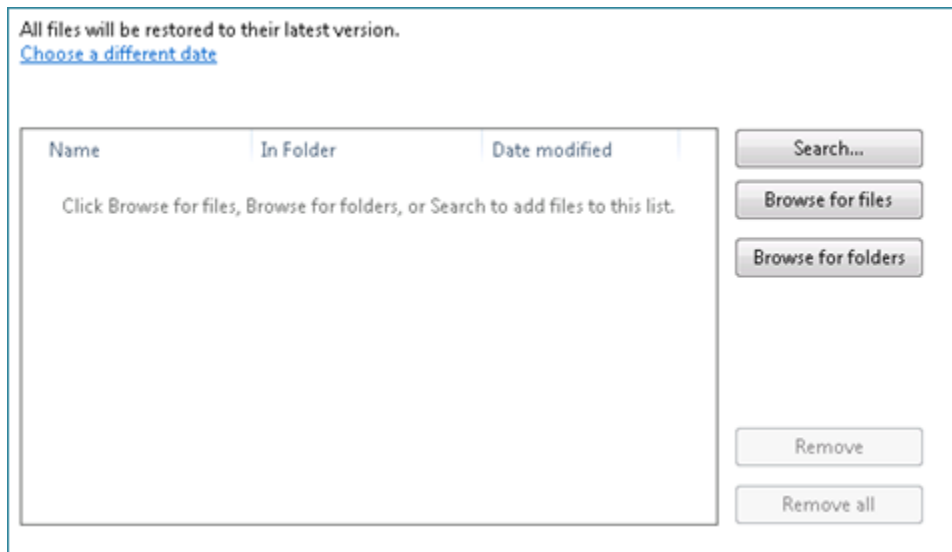
43. Go to **Start->Documents** and open the **Documents** library.

44. Delete the two files you created, **My Backup1** and **My Backup2**.

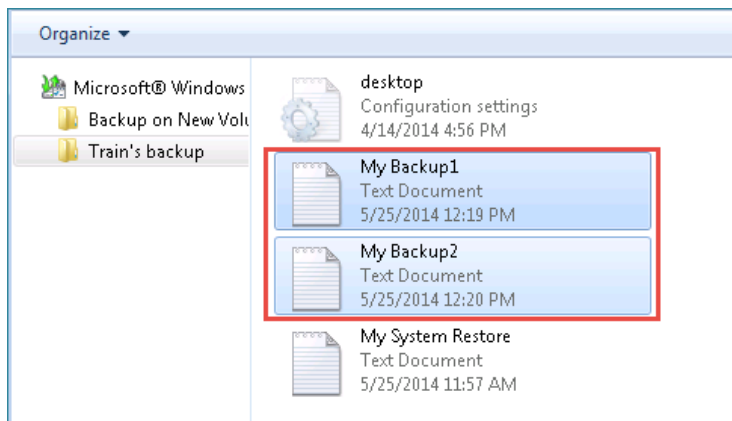
45. Empty the **Recycle Bin**.

46. On the **Backup and Restore** window, click **Restore my files**. This opens the **Select the backup that you want to restore files from** window.

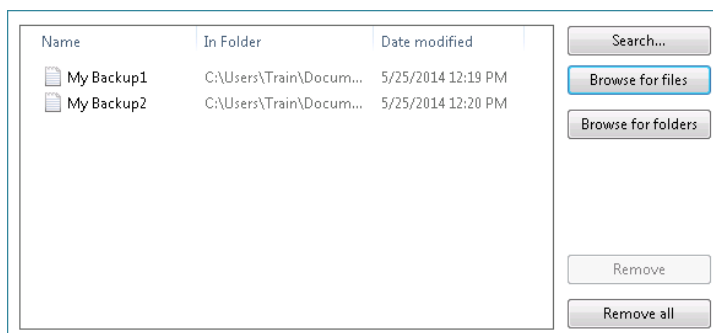
47. Click **Browse for files**.



48. Locate the two files you created, **My Backup1** and **My Backup2** in the **Train's backup Documents** folder.

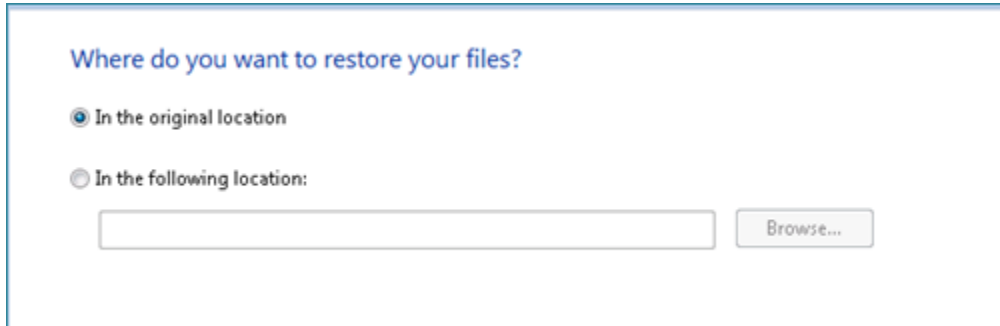


49. Select both files by clicking **My Backup1** and then holding down the CTRL key while clicking **My Backup2**. Click the **Add files** button.

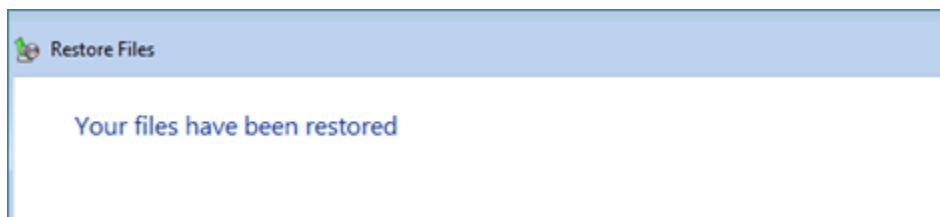


50. The files are now displayed in the browse and search window. Click **Next**.

51. You will then be asked where to restore the files to. Select **In the original location**, and then click **Restore**.

A screenshot of a Windows dialog box titled "Where do you want to restore your files?". It contains two radio button options. The first option, "In the original location", is selected with a blue dot. The second option, "In the following location:", is unselected. Below the second option is a text input field and a "Browse..." button.

52. A message indicates that your files have been restored. Click **Finish**.



53. Go to **Start->Documents**.

54. Open the files.

### 3.2 Conclusion

Data recovery is extremely expensive and proper maintenance can help lessen the likelihood of costly hardware failures. Backups are not a “set it and forget it” maintenance plan. There is nothing worse than attempting to recover files from a backup and realizing the backup process hasn’t been running properly. Testing your backup and recovery procedures will lessen the risk of losing valuable data.

## References

1. Computer Hope:  
<http://www.computerhope.com/jargon/d/diskclea.htm>
2. Improving computer performance:  
<http://windows.microsoft.com/en-us/windows/improve-performance-defragmenting-hard-disk#1TC=windows-7>
3. System restore:  
<http://windows.microsoft.com/en-us/windows/system-restore-faq#1TC=windows-7>

