

Quantum

**Remote/Primary Computer
System Recovery**

DATASTOR Shield™



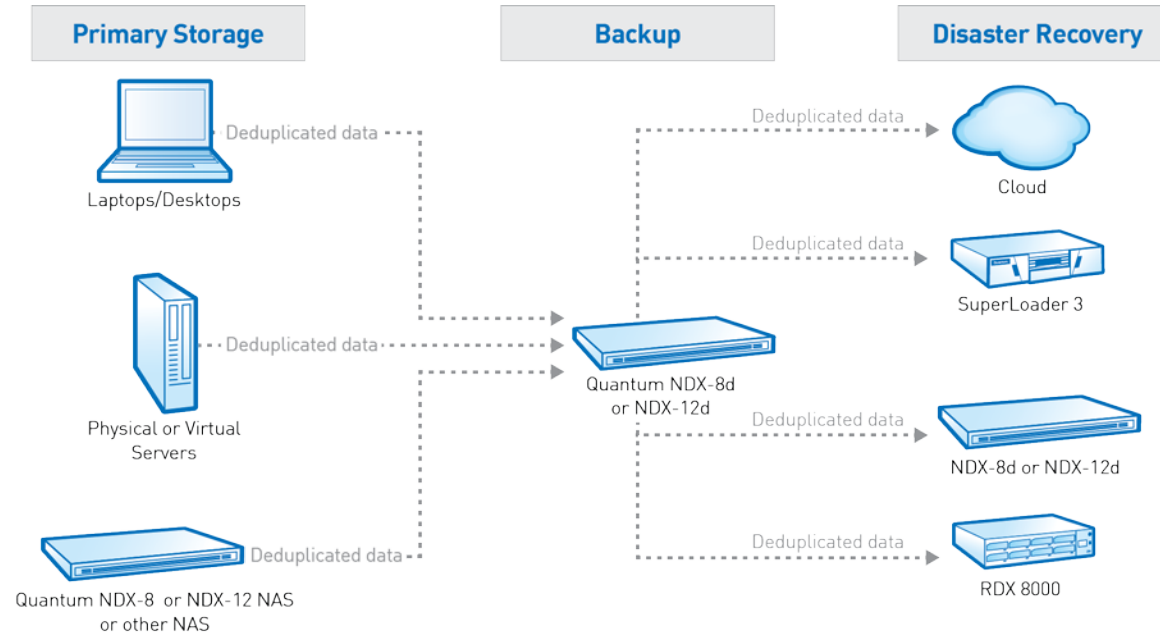
6-67559-03 Rev B

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Introduction

DATASTOR Shield introduces the ability to recover a complete remote/primary computer system. This function requires the **Advanced Feature Pack License** and remote server or desktop licenses for each computer you want be able to recover.



There are two basic elements for protecting and restoring a complete computer system using DATASTOR Shield.

- The first element is creating and running a Remote Computer System Protection plan. This plan type is available for local plans, and with proper licensing, for plans for Remote Computers. A wizard for creating the Computer System Protection plan steps the user through drive selection, store selection, and creation of a schedule for when the protection plan runs.
- The second element is the System Recovery Environment (SRE). When a complete system is being recovered, the computer needs to use a bootable device to bootstrap the recovery process. The System Recovery Environment is a custom Microsoft Windows 7 Pre-installation Environment image that can run from a CD/DVD drive, from a bootable USB drive, and in the case of a virtual machine recovery, when mounted as an ISO formatted bootable CD/DVD. After the computer has been booted with the SRE, the process of recovering the system is only a few steps away.

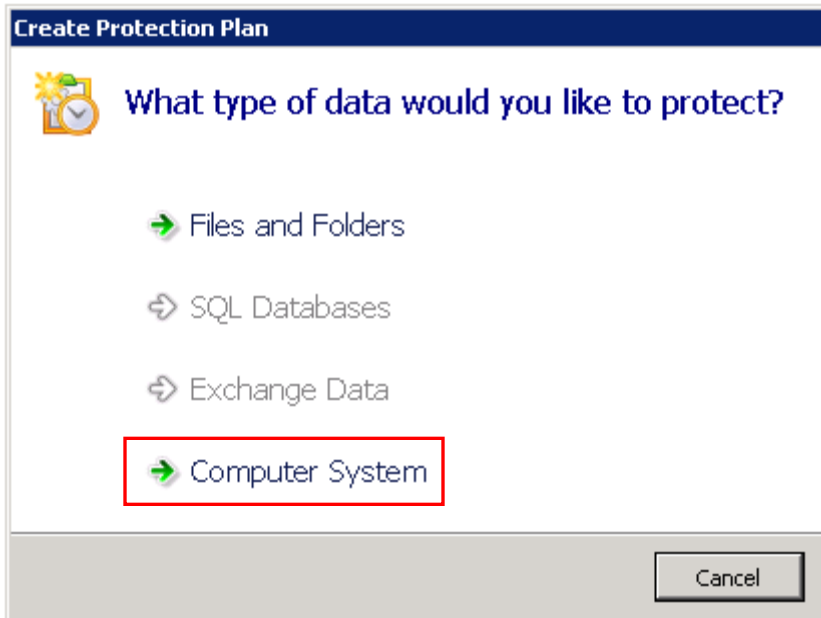
Note: SRE is not for saving your Archive Manager's Server configuration settings. When setting up your Archive Manager server, schedule an **Export Settings Task** to archive your Archive Manager Server's configuration settings to a folder location on a removable disk, such as an RDX, or to cloud storage.

Remote Computer System Protection Plan

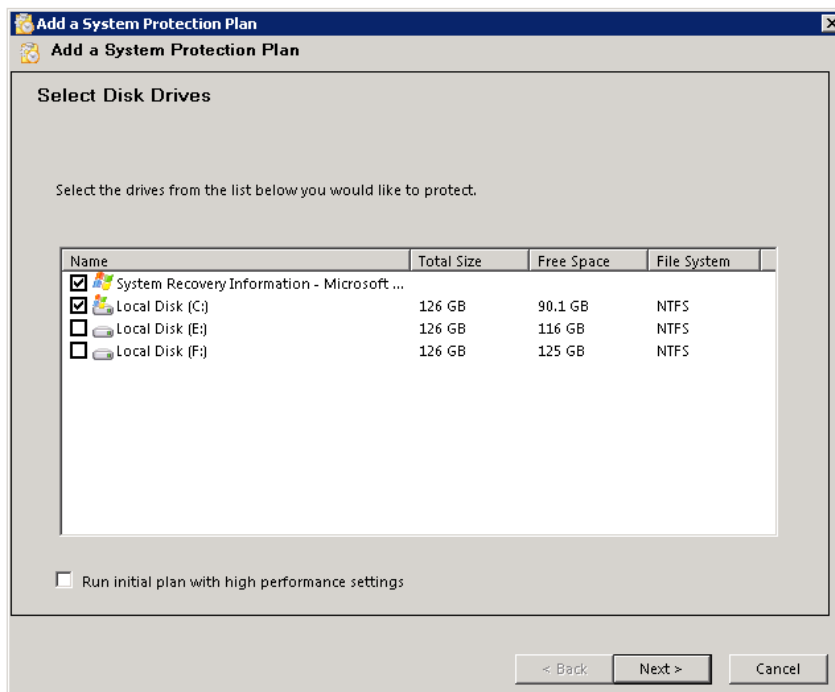
The Computer System Protection Plan saves the computer's system configuration information, including volume information and sizes, as well as all data on the computer. You can create a Computer System Protection Plan for the Windows Vista, 7, 2008 and 2008 R2 operating systems.

To start the **Add a System Protection Plan Wizard**:

1. Click **Create Protection Plan...** from the **Actions** for a Local Plan or a Remote Computer that you have added into the system.
2. Choose **Computer System** from the enabled plan types, as shown in the following image.



The **Select Disk Drives** window will display, as shown below.



As shown above, this window shows the elements that you can choose to protect. There are three types:

- **System Recovery Information** includes all files and configurations necessary to recover a working Windows setup. The icon for this choice is a large Windows flag.

Note: If your system has an F10 partition containing factory default settings it will not be protected by this plan. The System Recovery Information and System Disks will be protected and recovered with the settings that were in place when the protection plan was run.

- **System Drives** (not labeled as such) refer to the drive(s) on which the Windows operating system is stored. The icon for a system drive is a drive with a smaller Windows flag on it. In most cases, this will be only Drive C: (as shown above).
- **Data Drives** are all drives on the computer that are not system drives. These are indicated by a drive icon. In the image above, Drive E: and Drive F: are data drives. Only drives with non-removable media can be protected; removable drives are not listed.

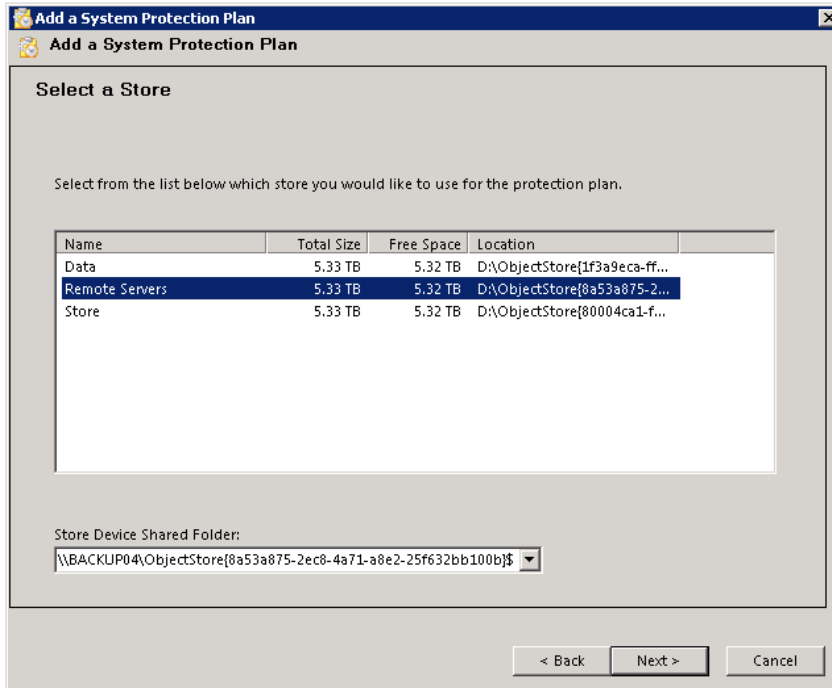
Note: It is best practice to protect System Recovery Information and the System Drives in a plan separate from the Data Drives.

3. Choose the elements that you want to protect.

- **To protect the operating system files and configurations**, check the **System Recovery Information ...** box.
- **To protect the System Disk(s)**, check the **checkbox for those drives** (this may only be Drive C:). When you protect the System Recovery Information, you must also protect the System Disk (Disks). If you ever want to exclude a system disk from protection, you must uncheck it in the **Add a System Protection Plan** window shown in the previous image.
- **To protect a Data Drive**, check the box for that drive. You do not have to select data drives as part of this plan—it may be preferable to protect data on a given data drive with a different plan type. For example, the data on a Data Drive might contain a Microsoft Exchange database and/or log files. In this case, an Exchange Data Protection Plan would be a better candidate for protecting the data on this drive, since only an Exchange Data type plan truncates logs.

4. Choose whether to check the **Run initial plan with high performance settings** checkbox. If you check this box, when a backup job runs, multiple simultaneous backups will be run, each of which performs a portion of the work, based on the number of CPUs in the system.

5. After you've checked all drives to protect, and have indicated whether to **run initial plan with high performance settings**, click **Next**. You'll see the **Select a Store** dialog box, as shown below.

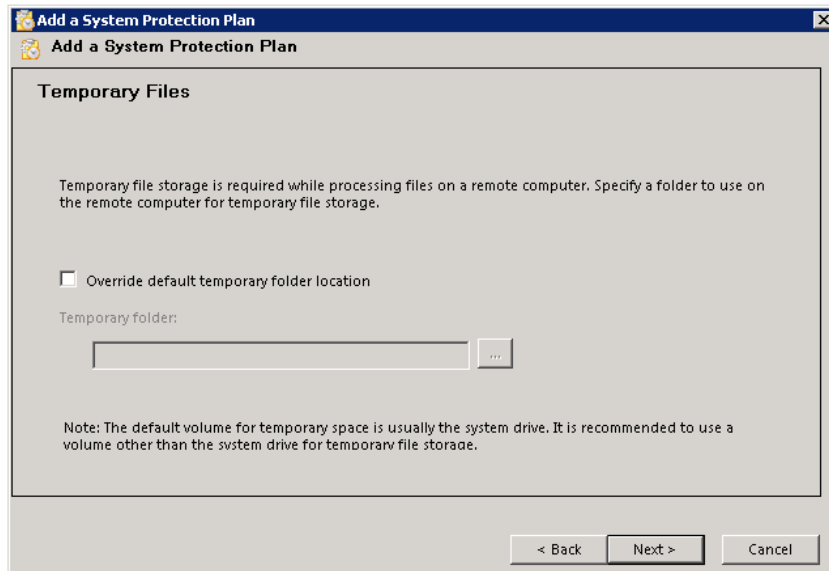


6. Next, select a store (storage location) for the system plan to use to store backup data and catalogs:
 - a. Select the store that you want to use, as shown in the image above.

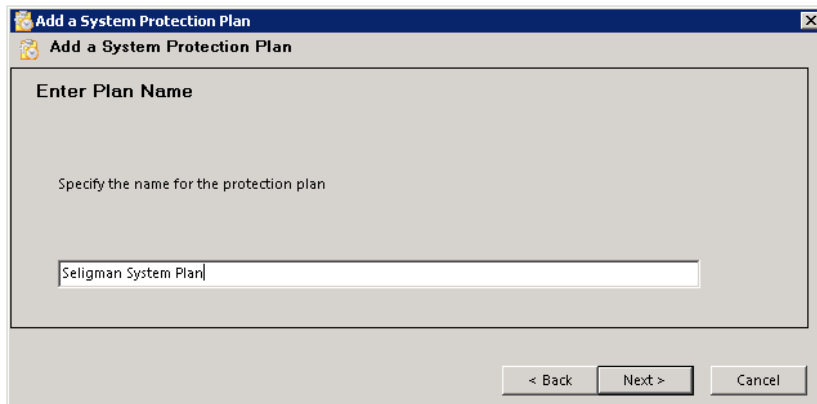
Note: Only one copy is saved when there are multiple copies of identical data. For this reason, a best practice is to use a store created specifically for Computer System type protection plans, since deduplication of data across servers is a big benefit when backing up several Windows computers. For information about the different types of stores, see the online help for **Storage**.

- b. Click **Next**.

You'll see the **Temporary Files** dialog box, as shown in the next image.



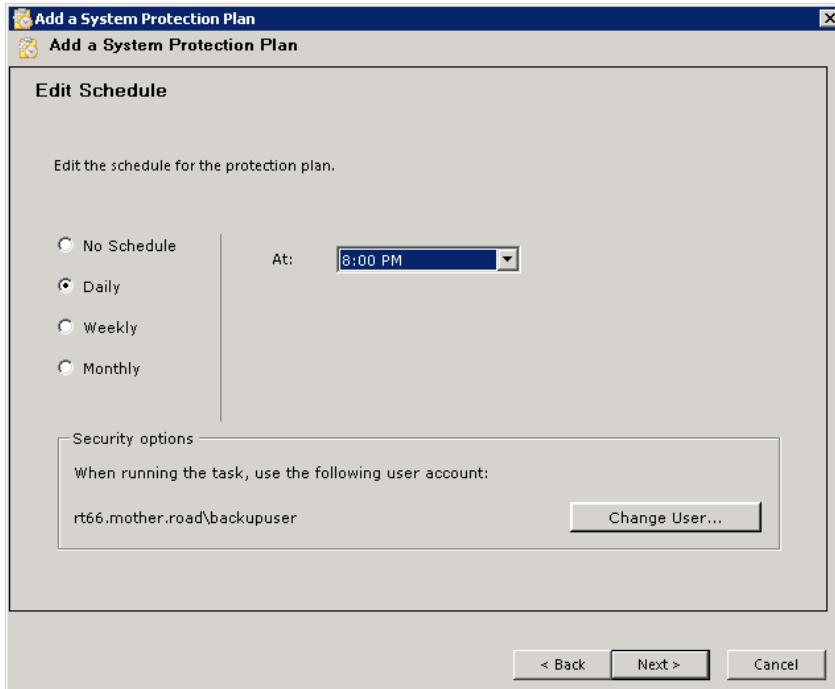
7. As stated in the image, you need to specify where to store temporary files on a remote computer while the remote computer is being backed up. By default, temporary files are stored on the System Drive (usually Drive C:).
 - *If you do not want to override the default storage location, skip to the next step.*
 - *If you want to store temporary files somewhere other than in the default location:*
 - a. Check the **Override default temporary folder location** checkbox.
 - b. Click the button to the right of the **Temporary folder** field and navigate to the folder in which you want to store temporary files.
8. Click **Next**. You'll see the **Enter Plan Name** dialog box, as shown below.



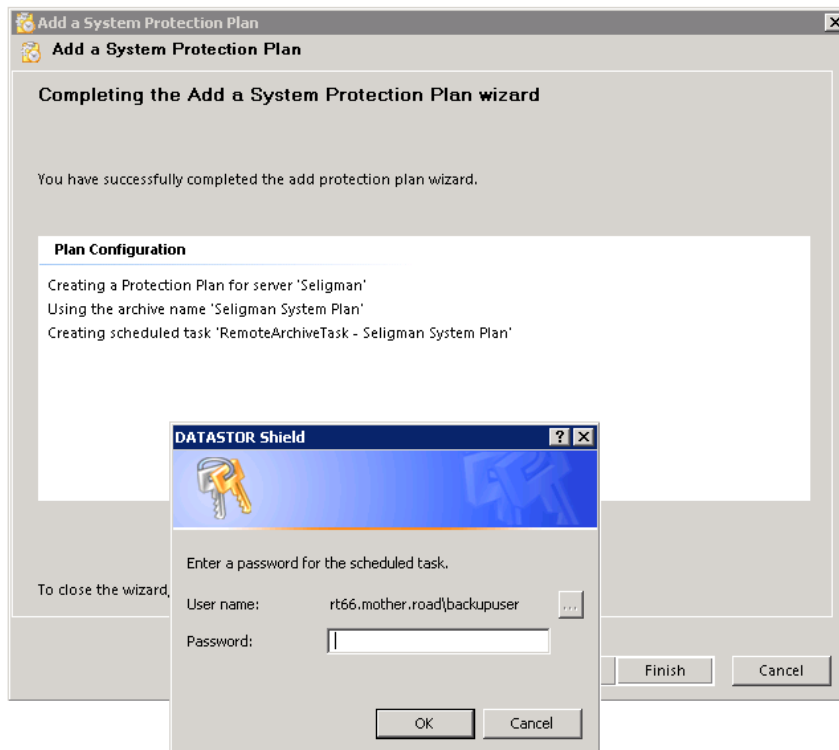
9. Provide a name for the protection plan. Protection plan names must be unique throughout the DATASTOR Shield system. A good practice for a Computer System Protection Plan is to use the computer name as part of the plan name, for example "Seligman System Plan," where "Seligman" is the name of the computer being protected.
10. Select a schedule for running the protection plan. A typical schedule for a system protection plan is to run daily or weekly after business hours. The **security options** section of the dialog box shown in the following image lets you specify a user account to use to run the plan. A good practice is to create a single domain administrator account to run all of the protection plans in the environment.

To make and save your changes:

- a. Make changes, as explained in the previous paragraph.
- b. Click **Change User**.



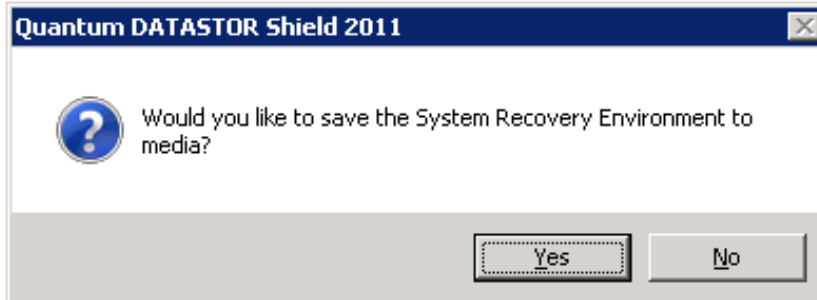
11. In the larger dialog box shown in the following image, click **Finish** to complete the wizard, or click **Back** to review or change any of the plan settings before saving the plan.
12. As shown in the smaller dialog box in the following image, you will be prompted for a password to save for the plan's "run as" user before the plan is saved to the system. Enter the password and click **OK** to save the plan.



After the plan has been saved, you'll see the dialog box shown below, which asks if you would like to save the System Recovery Environment (SRE) to media.

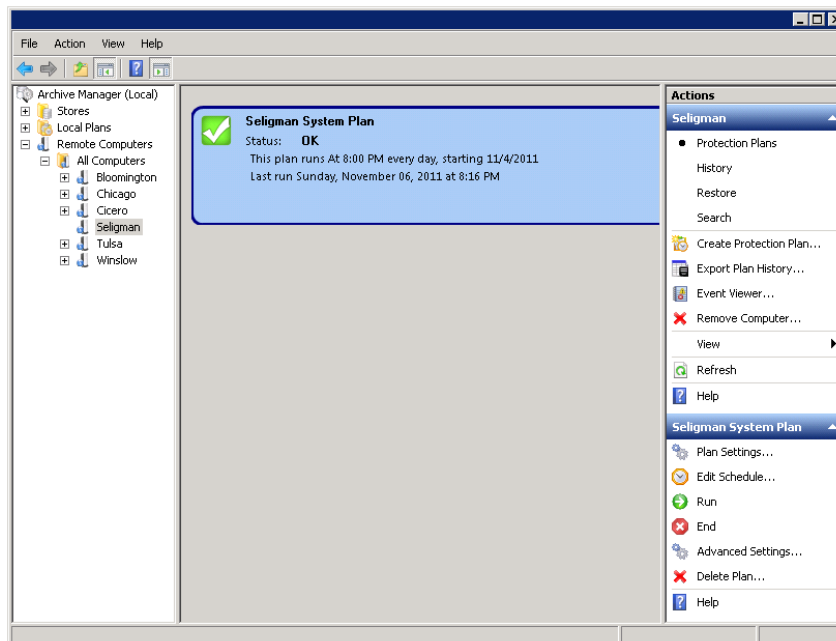
This dialog serves as a reminder to save the SRE before it is needed.

13. Click **Yes** and then follow the prompts.



Running a Protection Plan

When creating a protection plan, you can schedule the plan to run Daily, Weekly or Monthly at a specific time. You can view a summary of the schedule and the most recent run status from the **Protection Plans** when you select either **Local Plans** or a remote computer in the **Archive Manager** console.



After the plan is created, you can choose one of the following actions to review or modify how and when the plan runs: **Plan Settings**, **Edit Schedule**, **Run**, **End**, **Advanced Settings** or **Delete Plan**. You can always run the plan manually, without a schedule, using the **Run** action. For more information on these actions, select the **Help** for the selected plan.

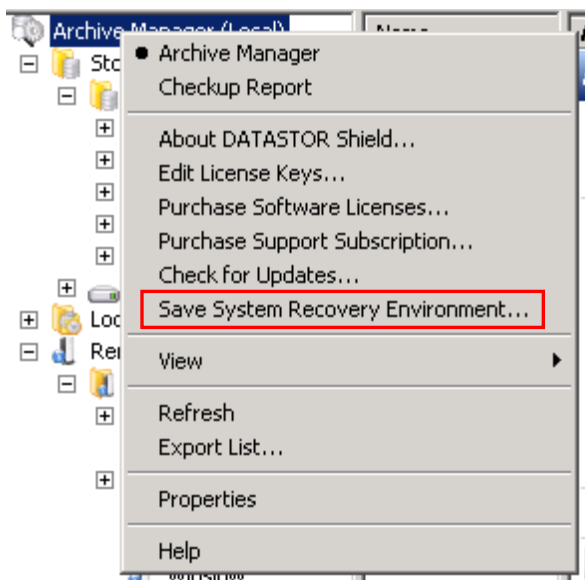
Saving the System Recovery Environment to Media

You must prepare bootable System Recovery Environment media for use with a System Recovery Protection Plan restore point during a system recovery.

Caution: There is an additional option to save the SRE with UEFI boot support. This option is required to recover a system that boots using UEFI instead of BIOS. You can check your system specifications from the system manufacturer to see if your system uses UEFI to boot. If you save the SRE using the UEFI option and attempt to boot a computer that does not have UEFI capability, the SRE will not boot. If you save the SRE without the UEFI option and boot a computer that does have UEFI capability the system will boot and an attempt to recover the system can be made, however the required boot information cannot be repaired.

There are two ways to save the System Recovery Environment (SRE) to media. Choose one of them:

- At the end of the **Add a System Protection Plan** wizard, you are prompted whether or not to save the SRE to media. You can save the SRE here, **OR**
- In the **Archive Manager** node of the console, click **Save System Recovery Environment**, as shown in the following image.



Whichever method you use, you will see the following dialog box. Select one of the choices there to save the SRE to a USB drive, .iso file, or CD/DVD, as discussed after the image.

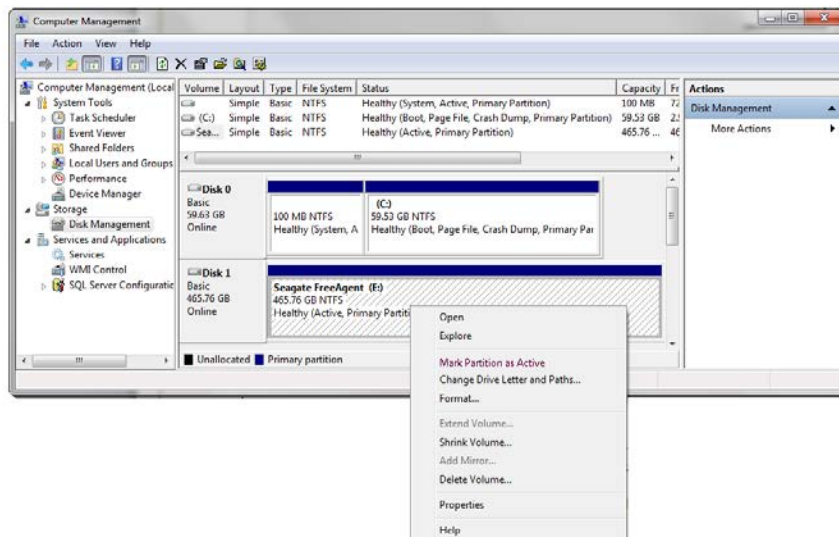


Copying to a USB Hard Drive

If you select the **Copy to a USB Drive** option, you will see the following image, which shows the image file to copy, and a list of available USB hard drives to use as a target for the copy.

Please note that:

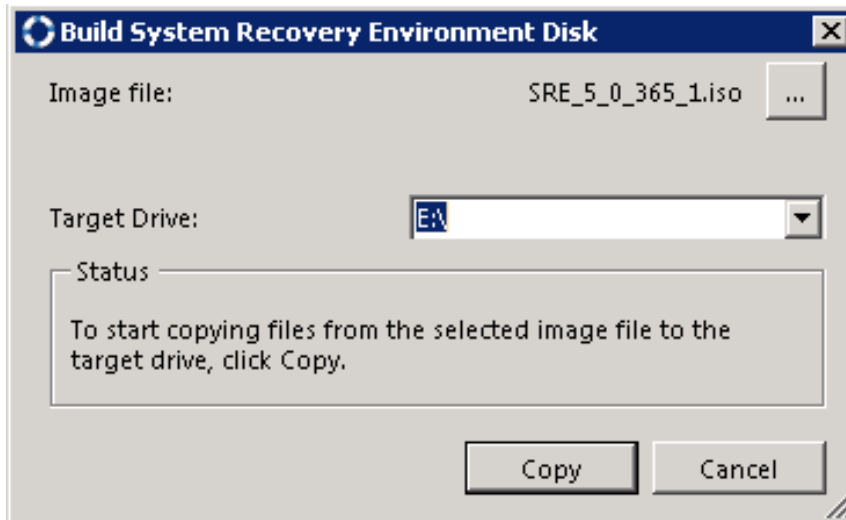
- Only the first partition on a USB hard drive can be used.
- Make sure that you set the partition on that drive to **active** using a utility like Disk Manager or DISKPART. This will allow the USB hard drive to boot a system.



When you copy to a to a USB hard drive, the drive will not be formatted, and all existing data will be preserved. The required files to make the drive bootable with the SRE are copied to the drive.

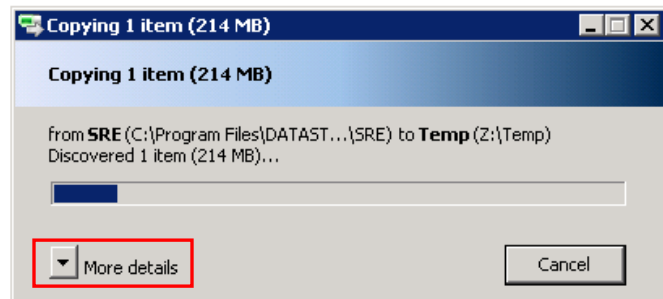
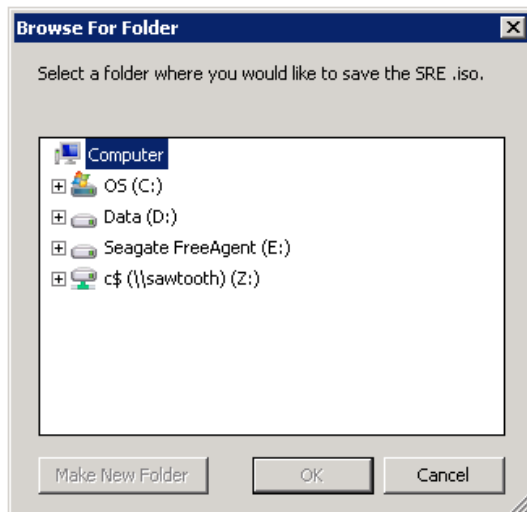
To copy the SRE to a USB hard drive:

1. Click **Copy**, when you are ready to copy the information to the target drive.
2. When the copy completes, click **Cancel** to close the dialog box.



Copying the SRE to an .iso file

If you select the **Copy SRE .iso file** option, you'll see the **Browse for Folder** window, shown on the left below.



To perform the copy:

1. Navigate to a location to save the SRE .iso file. Choose a folder on a local or mapped drive, as shown in the left-hand image above.
2. Click **OK** (it will no longer be grayed out, as it is in the above image).

You'll see a progress bar, as shown in the right-hand image above. You can get more information about the process by clicking the **More details** button.

When the copy completes, the **Copying 1 item** window in the image on the right above will close.

3. Navigate to the destination folder to burn the .iso to CD/DVD using other applications, or to prepare for a recovery in a virtual environment.

The SRE .iso file is an ISO formatted file that can be used to boot virtual machines. Most virtual machine hypervisors let you configure a virtual machine to boot from CD/DVD devices or ISO formatted files.

You can also copy this file to a CD or DVD by using **isoburn.exe** on a Windows 7 or Windows 2008 R2 computer, or by using a third-party CD/DVD burner.

Burning to CD or DVD

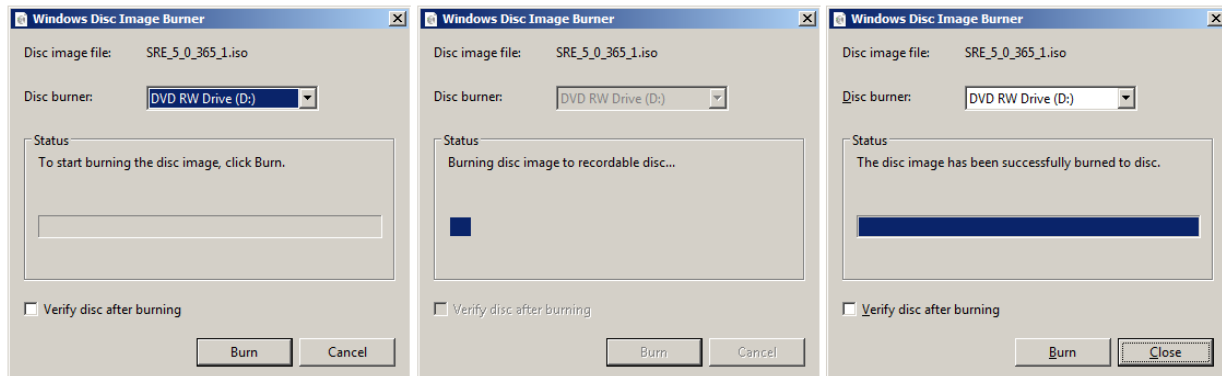
If you select the **Burn to CD or DVD** option, you will see the **Windows Disc Image Burner** dialog box shown at the left of the following image.

1. Select the CD/DVD drive to on which you want to burn a bootable disc.
2. If you want to verify the disc after burning, check the **Verify disc after burning** box.
3. Click **Burn**.

You'll see the progress bar shown in the center image below.

4. When the disc has been burned, click **Close**, as shown in the right-hand image below.

This option is only available if the program Windows Disc Image Burner (**isoburn.exe**) is installed on your computer. This program is installed by default on Windows 7 and on Windows 2008 R2 systems that have the Desktop Experience feature installed.



Restoring Data from a Computer System Protection Plan

The Computer System Protection Plan stores all of the system information and system data needed to restore a computer. Optionally, it can store some or all of any attached Data disk volumes.

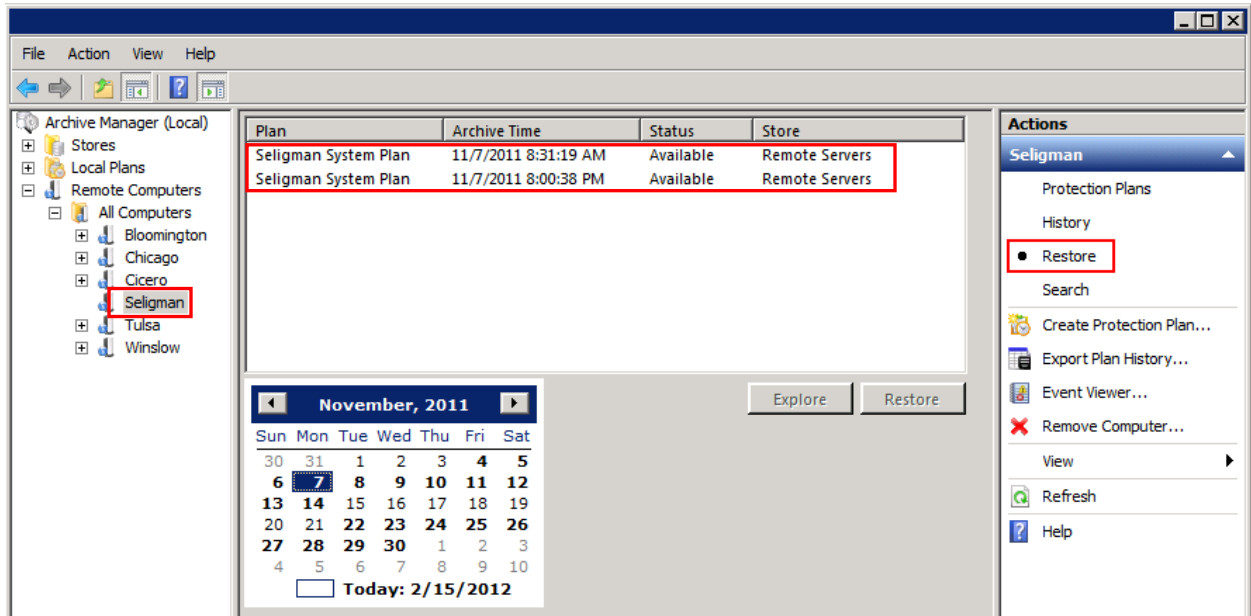
However, this plan type is not limited to full system recovery.

You can also restore individual files or folders from the **Restore** view for “Local Plans” or from a remote computer, as discussed below.

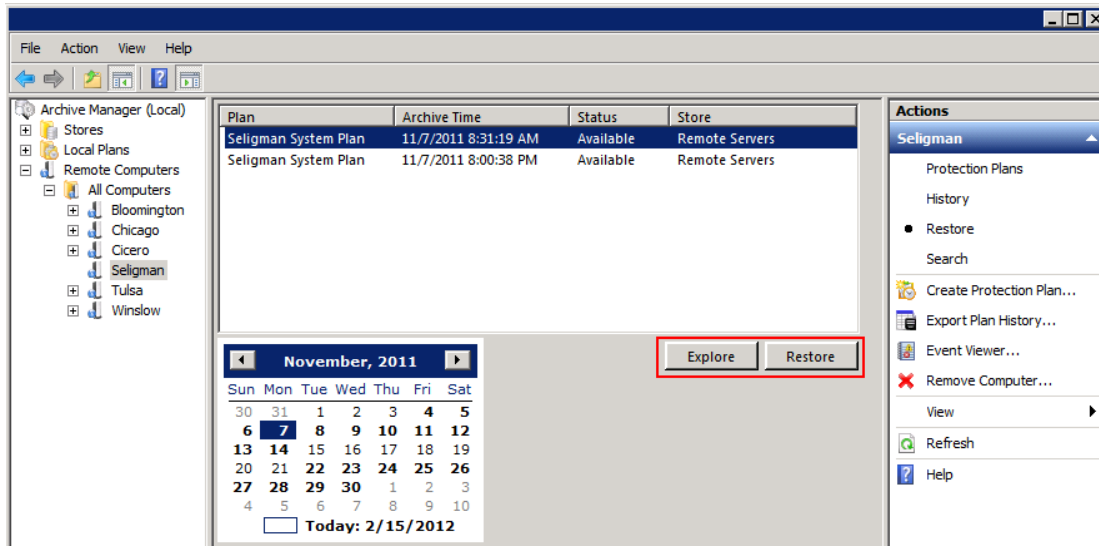
To restore data:

1. In the **Archive Manager** window (at the left side of the following image), select **Local Plans** or a remote computer. Here, we've selected **Seligman**, which is a remote computer.
2. In the **Actions** pane, select the **Restore** view, as shown in the image below.

The available recovery point dates and times will be displayed in the center, at the top. (In this case, there are two, as shown below).



3. Select the date and time you want to recover, as shown in the image below. As shown there, we've selected the first **Seligman System Plan**, with an Archive Time of 11/7/2001 8:31:19 AM.

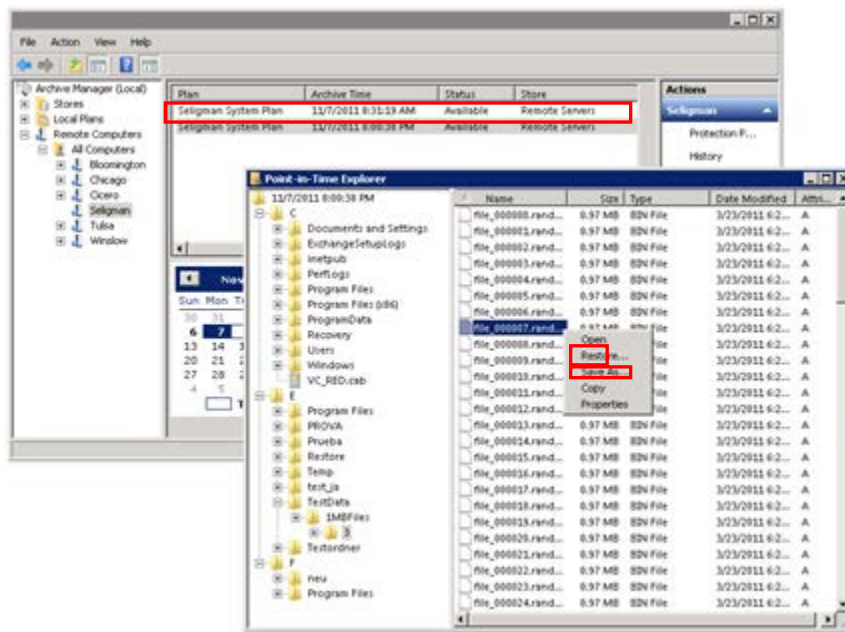


Do **one** of the following:

- **If you want to select specified files and/or folders**, do the following. **If you want to restore ALL of the data from the recovery point**, skip to the next bulleted item.
 - a. Click the **Explore** button (see the previous image) to view a Windows Explorer-style listing of the files and folders contained in that recovery point.
 - b. In the **Point-in-Time Explorer** window (see the image below), in the left-hand pane, select the subset of the data that you want to restore. This could be any branch of the tree

structure shown, such as drives and folders. The children of the item you have chosen will be displayed on the right.

- c. The right-hand pane will show data available for restore in the data subset that you chose, as shown in the lower part of the following image. Choose one or more items, using standard Windows Explorer methods, such as clicking and control-clicking.
- d. Right-click the selected item(s). As shown in the following image, for a file, you can open it, restore it, save as, copy it, and view the properties. Viewing the properties of a folder can show you how space it would require for a restore.
- e. When you are ready to restore the item(s) you chose, right-click them and select **Restore**, as shown in the second line of the drop-down menu image below.



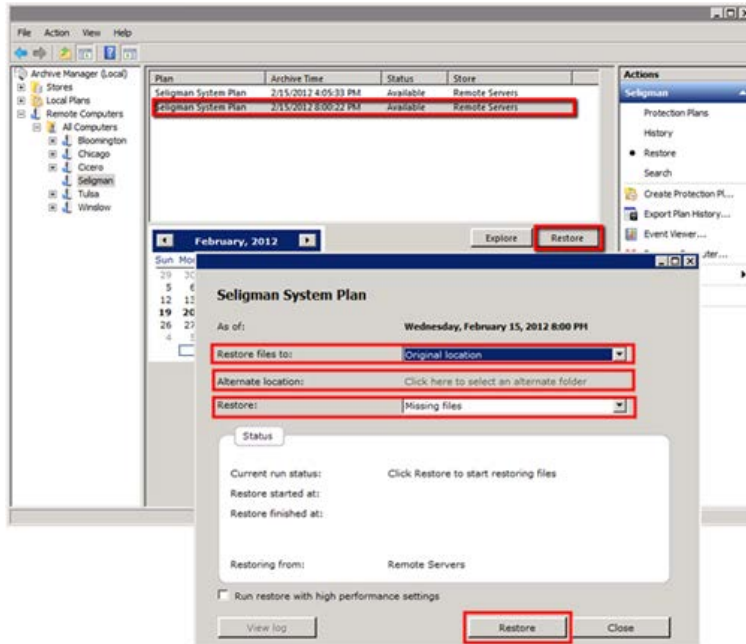
- f. Continue with Step 4 on p.16.

Note: This method only restores the data from the backup. You must use the System Recovery Environment to restore an entire system.

- ***If you want to restore ALL of the data from the recovery point,***

Click the **Restore** button, as shown in Step 3 on p.14.

You'll see the window for the selected recovery point (in this case, **Seligman System Plan**), as shown in the following image.



4. Make choices in the following areas of the bottom window in the image above:

- **Restore files to:** Choose where to put the restored files. You have the following choices:
 - **Original location** - Choose this to restore your file(s) to the folder(s) from which they were archived. This is the default. If the folder(s) no longer exist, they will be created again, preserving any hierarchical levels.

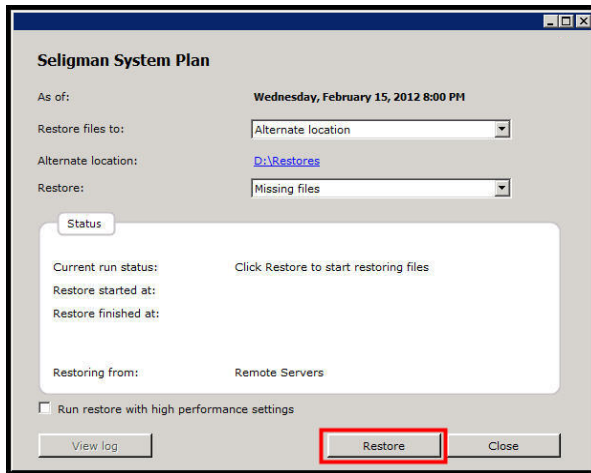
If this is your choice, **choose it now**, then **skip to the next numbered step**.
 - **Alternate location** - Choose this restore your files to a location (folder or folders) other than the one(s) from which they were archived. This option will preserve the hierarchical folder structure of the archived data. All folders and subfolders that existed when the protection plan archived the data will appear in the alternate folder that you choose.
 - To restore your files to an **Alternate location**:
 - a) Click the **Restore files to** drop-down list, and click **Alternate Location**. The text next to **Alternate location** becomes active and is displayed as a blue hyperlink.
 - b) Click the **Click here to select an alternate folder** link.
 - c) In the dialog box that now displays, navigate to, and select, the folder to which you want to restore the files.

5. Choose which set of files to restore. You have three choices, from which you must choose one:

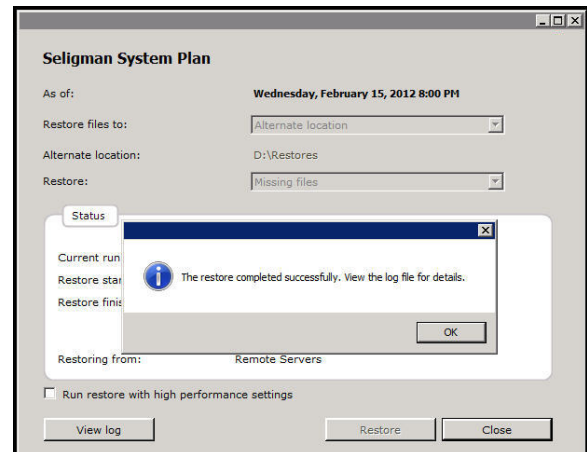
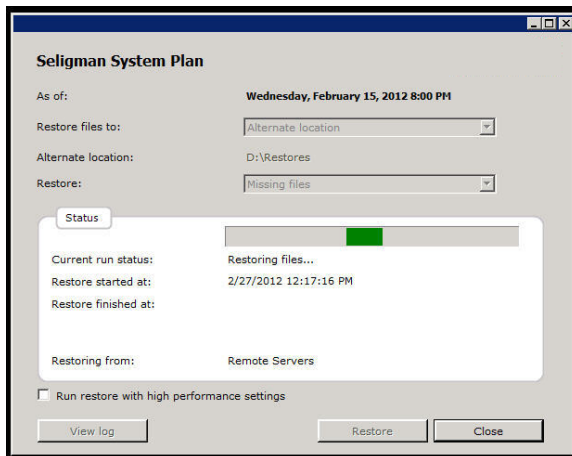
- **Missing files** (shown in the image above) - Choose this option if you want the restore operation to do the following:
 - *Only* restore files that *were in the original location*, but that *do not exist* in the *folder(s) to which you are restoring*.
 - Leave all files *unchanged* that exist *both* in the *original location* and in the *folder(s) to which you are restoring*.

- **Missing files and files that are older** - Choose this option if you want the restore operation to restore *files that no longer exist in the original folder (are missing)* and to *replace older files in the restore location with newer files from your archive*.
- **Missing files and files that are different** - Choose this option if you want the restore operation to restore files that *no longer exist in the original folder (are missing)* and to *replace files in the restore location, regardless of whether the archived files are newer or older*. You might choose this option if you are rebuilding a particular area of your hard disk.

6. After you've chosen all options, click **Restore**, as shown below.



The file(s) you have chosen will be restored to the folder(s) that you specified. You'll see the following screens as the restoration progresses (left) and completes (right):



Note: Restoring all or part of your data only restores the data from the backup. You must use the System Recovery Environment to restore an entire system.

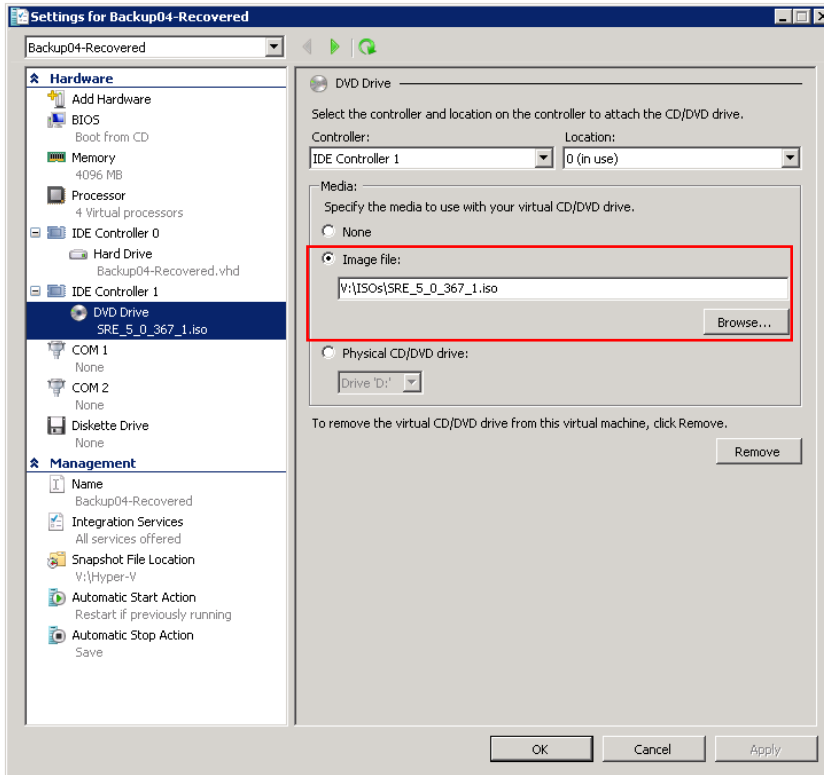
Booting a Computer for Recovery

When you need to recover a computer, use the System Recovery Environment (SRE) to boot it. Most modern computers can boot from CD/DVD or USB drives. Check your computer specifications and BIOS support for booting from CD/DVD or USB drives.

You may have to select the boot drive from a boot menu at startup, or adjust the BIOS to have the system choose to boot from a CD/DVD or USB drive.

Virtual machine hosts, sometimes referred to as *hypervisors*, allow a virtual machine (VM) to be configured to boot from a physical CD/DVD drive, or from a virtual CD/DVD drive linked to an ISO image file (.iso extension).

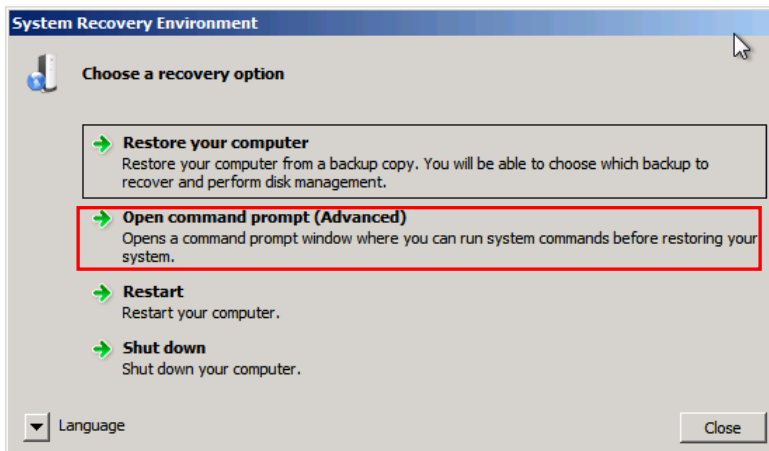
To recover a VM using the SRE, configure the VM to boot from CD/DVD media, or copy the SRE ISO file to the hypervisor and configure the system to boot from an ISO file on a CD/DVD drive. The image below is an example of configuring a VM with Microsoft Hyper-V to boot from an ISO file.



After you boot the SRE, you will see the **Choose a recovery option** screen shown below.

To restore your computer:

1. Select **Restore your computer**, as shown in the image below.
2. A System Recovery Wizard will run. Follow the prompts, which are discussed in the next section.



As shown in the image, from this screen, you can open a command prompt to use system commands, restart your computer, or shut it down. Usually, you can restore a computer without command line prompts. However, there are several reasons for using the command prompt, such as setting the IP address for a network adapter using the **netsh** command, if the DHCP server does not provide one.

Using the Wizard to Restore Your Computer

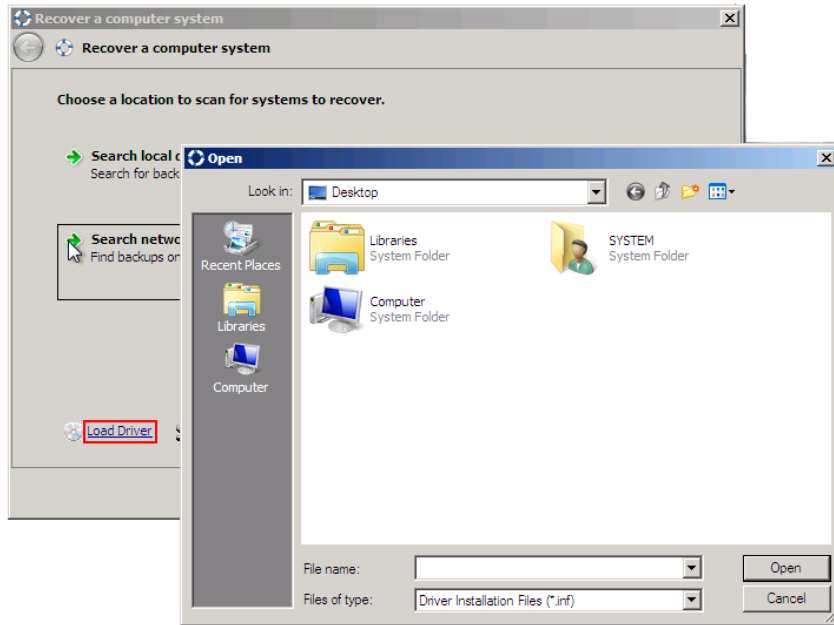
The first step is to help the wizard find stores and archives that contain recovery points that were previously produced by running Computer System Protection Plans.

There are two locations that the wizard can search to find recovery points—local disks and network locations. Local disks could range from USB drives (such as RDX) to direct attached storage (DAS), to iSCSI-connected disks. Network locations are shares on an Archive Manager computer that have stores shared for remote access.

Note: To search network locations, the SRE has to be able to bind to a network adapter. At boot time, the SRE searches all of the network drivers to find a match for your hardware.

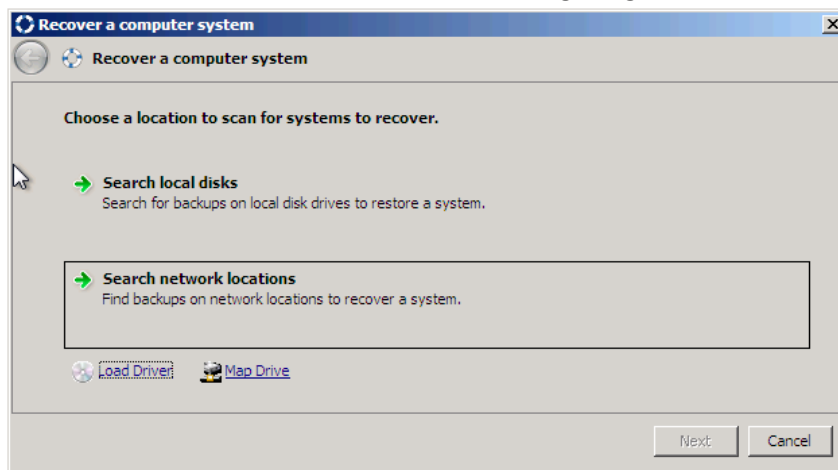
If a network driver is available and is compatible with your system, it is loaded and attempts to obtain an IP address using DHCP.

If a network driver cannot be loaded by the SRE, click **Load Driver**, as shown in the next image, to browse for a 32-bit network adapter driver compatible with your system. When the network adapter driver is loaded, the driver attempts to obtain an IP address using DHCP.



Now that you have a driver, you need to find object stores and archives that contain recovery points produced by running Computer System Protection Plans:

1. Select one of the choices shown in the following image:



- **To search local disks**, click **Search local disks**. The drives attached to the system are scanned for possible systems to recover. Skip the rest of this step and go to the next numbered step.
- **To search network locations**, click **Search network locations** and follow the steps below.

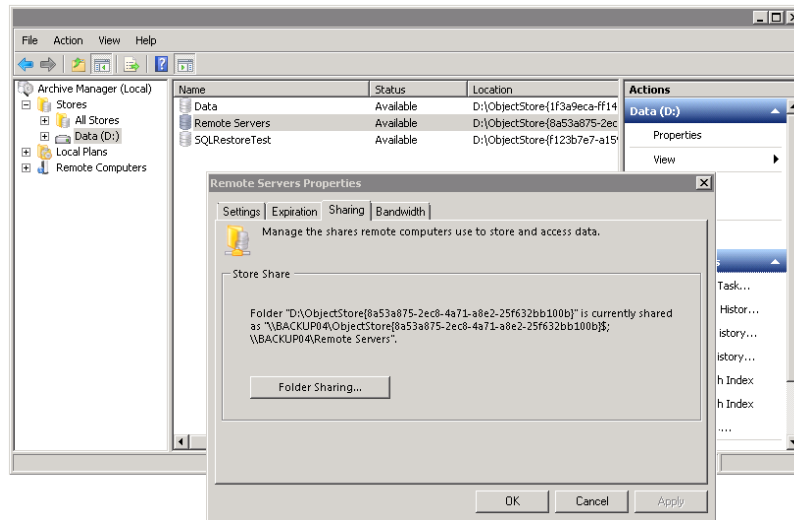
You will be prompted to map a network drive letter to a UNC path.

a. Do **one** of the following:

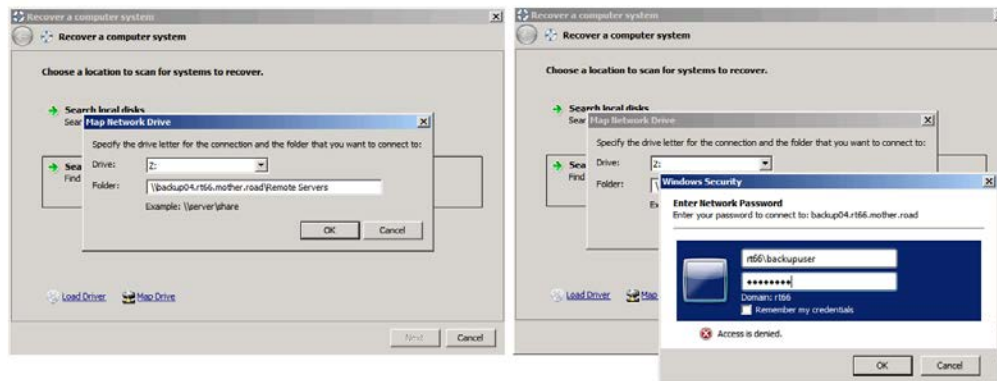
- Choose a specific store share or the administrative share for a drive where one or more stores reside. The simplest way is to use the administrative share, because the wizard searches all stores on the drive for possible systems to recover.

For example, if your stores are on the D drive of your archive manager server, you can specify `\\<archive manager>\D$` as the folder, **OR**

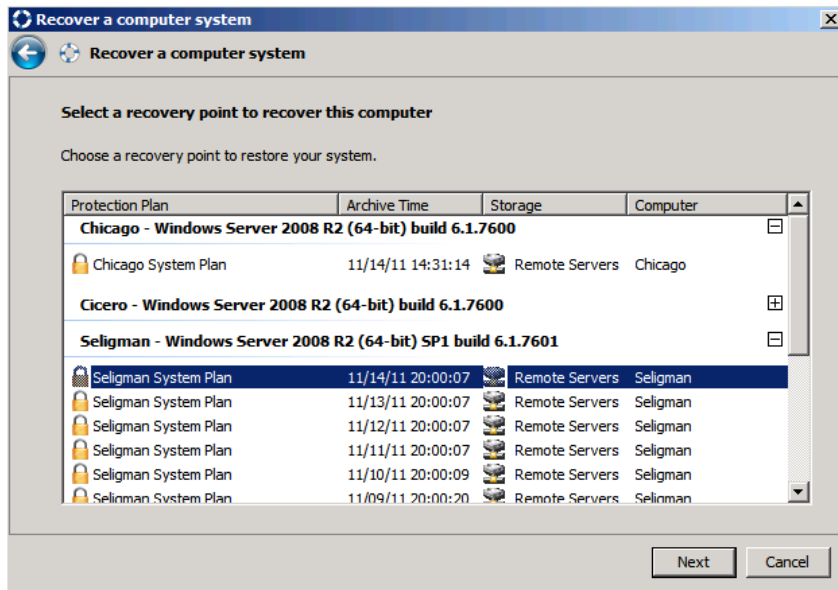
- Find the share name for an object store by right-clicking the object store in the Archive Manager console and selecting **Properties**. The **Folder Sharing** tab (shown in the following image) has a list of the possible shares that you can use for the store.



- When you have chosen the object share or archive, click **OK** to complete the process, if you haven't already.
- In the **Windows Security** window shown in the next image, enter the user ID and password for the user account that can access the store. Use the same account for accessing the store through a network folder that you use for your protection plans.
- Click **OK**.



- You'll see the **Select a recovery point to recover this computer** dialog box, as shown below:



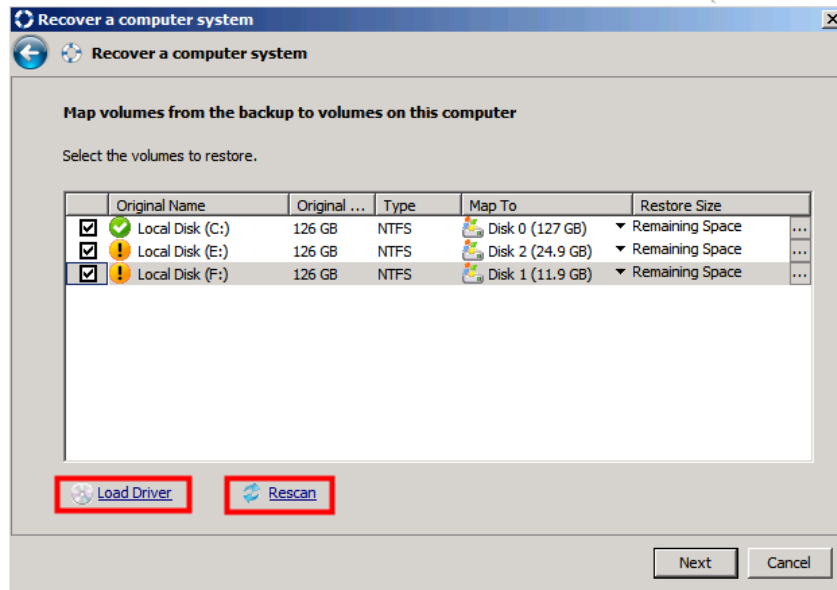
This dialog box lets you select the system, system plan, and recovery point to use. As shown above, each system that has recovery points available in the stores that were found is displayed in the list as a group.

In this dialog box:

- The boldfaced headings show the system name, OS version and build of each system with available recovery points. Initially, only this heading displays.
- To see all available recovery point for a given system, click the + symbol to the right of its name. In the image above, we see the first 6 recovery points for **Seligman** (because the user has clicked the + sign for it), but none of the available recovery points for **Cicero** (because the user has not yet clicked the + for that system).
- The line for each displayed recovery point shows the name of the protection plan that created the recovery point, and when the protection plan ran.

You now need to choose a recovery point for a system:

3. Click the + sign in the heading for that system, to expand the recovery point list.
4. Select the recovery point you would like to restore to the computer, and click **Next**. You will see the following dialog box:



Note: If no drives are displayed in the window for volume mapping, you may need to install a driver for a storage controller on your computer. If you need to load a driver, click **Load Driver**, browse for and install a compatible 32-bit driver, and then click **Rescan**.

After the dialog box has displayed volumes (drives) to restore, you must configure the volume-to-drive mapping for the restore. As shown in the image above, the volumes that were selected by the protection plan are displayed with the original drive label and letter (**Original Name** column), capacity (**Original...** column), and file system type (**Type** column).

You will now map the volumes from the selected recovery point to volumes on the computer for which you have chosen a recovery point (see the previous image).

5. Check the checkbox (far left) for the first drive that you would like to restore.
 - As shown in the image above, the **Map To** column will automatically display the first disk drive attached to the system [for **Local Disk (C:)** above, this is **Disk 0 (127 GB)**].
 - The **Remaining Space** column will automatically display **Remaining Space**, meaning that all remaining space on the drive will be used for the volume that will be created on the drive for the restore.
6. If the current choices for **Map To** and/or **Restore Size** are not what you want, you can change them:
 - **To change the volume mapping**, click the triangle at the right of the **Map To** column. In the drop-down list (not shown), select a different mapping.
 - **To change the Restore Size**, click the button at the right of the **Restore Size** column and change the size in the dialog box that displays (not shown).


In the row for each disk volume you have chosen to restore, an icon will display between the checkbox for that disk and the name in the **Original Name** column. The next step shows how to interpret these icons.

7. For each volume you have chosen in the **Original Name** column, you may or may not need to take further action:

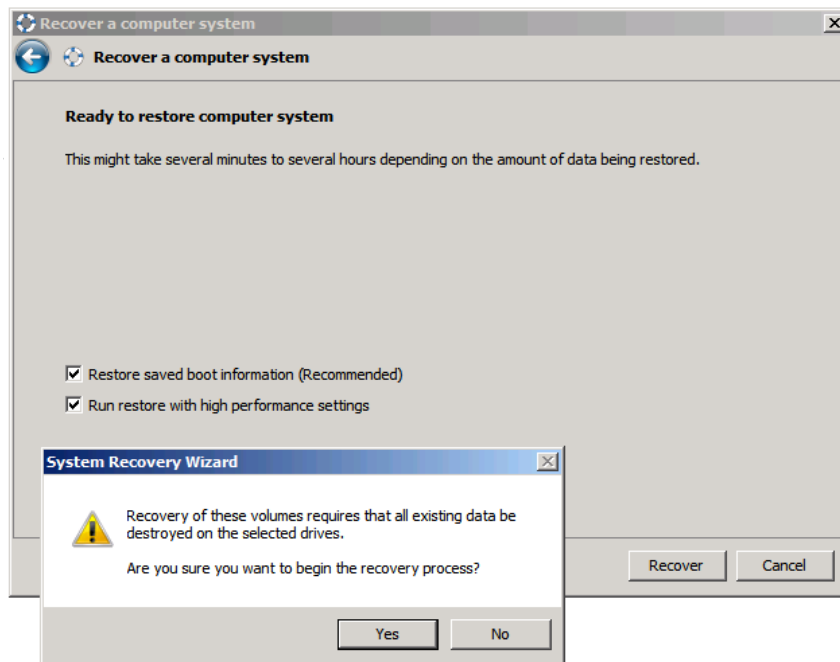
- **If a volume HAS enough room for the restore**, its icon will be a checkmark, as for **Local Disk (C:)** in the previous image.

Because of this good volume-to-drive mapping, you do not need to take further action for this volume.

- **If a volume DOES NOT HAVE enough room for the restore**, its icon will be an exclamation (warning icon), as for **Local Disk (E:)** and for **Local Disk (F:)** in the previous image.

To fix this unworkable volume-to-drive mapping, click the back button  to return to step 6 on p. 23 and follow the instructions from there.

8. When you are satisfied with your mappings, click **Next**. The **Recover a computer system** dialog box will display the message **Ready to restore computer system**, as shown in the following image.



9. As shown in the image above, there are two checkbox options on this page, whether to **Restore saved boot information**, and whether to **Run restore with high performance settings**.

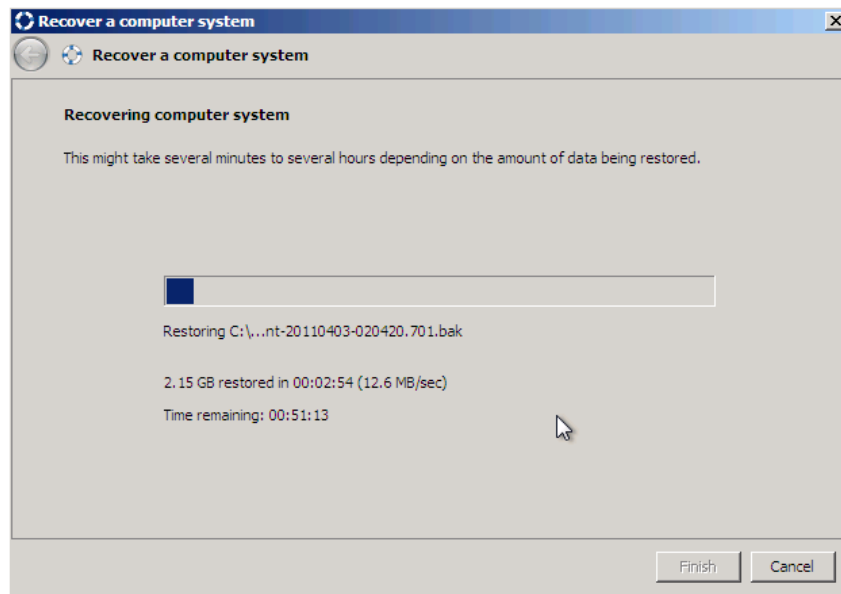
- It is recommended that you always choose **Restore saved boot information**
- Choosing to run with high performance settings performs multiple restores simultaneously. This can negatively impact system performance.

Check any boxes that you want, then click **Recover**.

10. Because the restore operation overwrites all data on the drives selected for restoring onto, you'll now see the warning dialog box at the bottom of the image above.

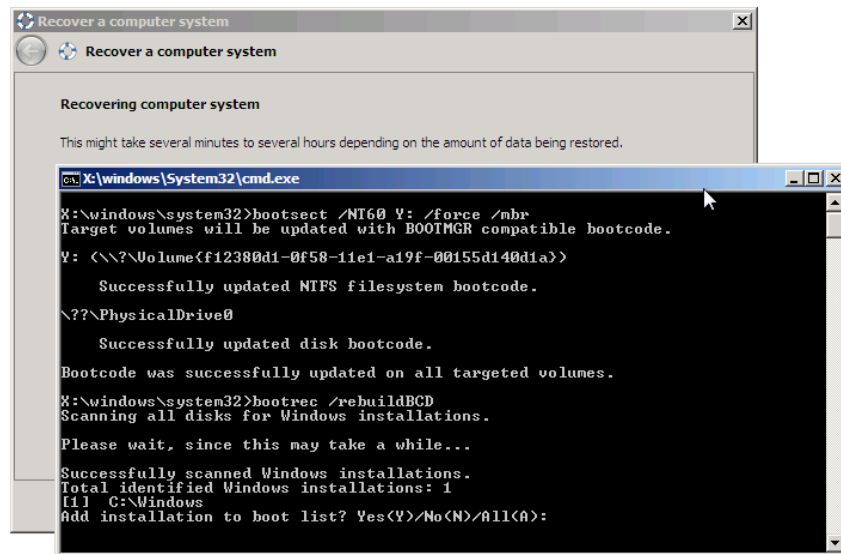
- **If you want to run the recovery operation** that you just set up, click **Yes**, continue with the next numbered step.
- **If you DON'T want to run the recovery option**, click **No**. Selecting **No** returns you to the **Ready to restore computer system** screen (see the previous image), where you can cancel the recovery.

When the restore starts, you'll see the dialog box shown below. This lets you monitor the throughput and see an estimate of when the restore will finish, based on the current throughput.



11. When the restore is done, the **Finish** button, which is grayed out in the image above, becomes active. Click the **Finish** button.

When the file restore operation completes, you will see the DOS-mode command window in the following image.



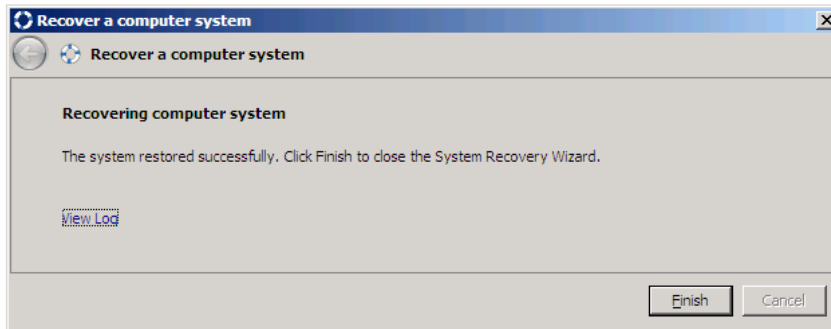
As shown above, you will be prompted to restore the boot information for each Windows installation found on the disk drives of the computer. Here, the restoration operation is asking you what to do for [1] C:\windows (the first drive that the user specified to restore).

Caution: At the **Add installation to boot list?** prompt discussed below, Quantum highly recommends that you **always** answer **A** or **Y** at the prompts. If you answer **N** for a boot drive, the restored system may not boot.

At the **Add installation to boot list?** prompt (last line in the image above):

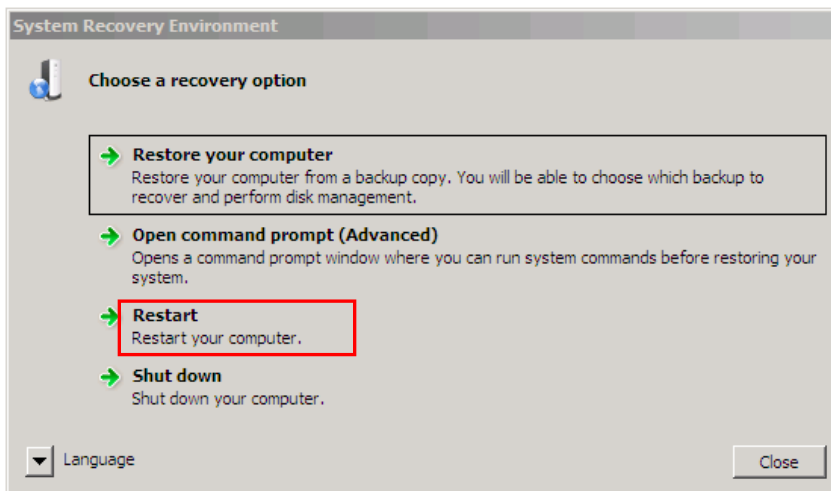
- Press **A** if you want to restore the boot information for **all** of the disk drives being restored. Boot information will be added to all drives, and you will not be asked about subsequent drives.
- **Alternatively, you can answer Y or N for each drive, one by one.** To do so, press **Y** or **N** when asked about each drive. As noted above, Quantum recommends **Y**.

12. When the restore is finished, you'll see the dialog box shown below:



13. If you wish to view the Restore Log, click **View Log**.

14. To finish the restore operation, click **Finish**. You'll see the SRE launch screen.



When the SRE launch screen displays, you can choose to restart the computer and boot into the restored OS, as shown in the red box above.

Note: You may need to adjust your BIOS boot menu if you changed it during the recovery process.