



**C A S P E R<sup>TM</sup>**

**S E R V E R E D I T I O N 8 . 0**

**U S E R G U I D E**



**Future Systems**  
SOLUTIONS

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# Introduction

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Casper™ Server Edition is a disk cloning and imaging solution designed for use on Windows® server based platforms. Whether you need to upgrade a server with a new disk to increase speed or storage capacity, replace a failed disk, or maintain an instantly bootable backup replacement for a server, Casper Server Edition is designed to make the process extraordinarily easy.

Casper Server Edition features:

- **Fast System Disk Upgrades and Replacements.** Casper quickly clones a single disk or hardware RAID array to another disk or array to increase speed, increase capacity, or replace a failed disk or array. Supports all SAS, SCSI, SATA, ATA/IDE, and hardware RAID configurations, including solid state devices and solid state arrays.
- **Complete System Backups.** Casper creates a complete backup of a Windows server system disk or hardware RAID array. In addition, exclusive SmartClone™ technology enables Casper to maintain a complete backup replacement disk or array in the same amount of time required by most traditional backup programs to perform a partial or incremental backup.
- **Effortless Restoration.** Casper provides easy, one-step support for restoring a failed system disk or RAID array from a backup. Casper automatically locates available backups, you choose which backup to restore, and then Casper does the rest. Casper will even seek out backups from multiple locations.
- **Rapid Recovery.** In the event of a hard disk or RAID array failure, a Casper bootable backup can be used as an immediate and permanent replacement for the failed hard disk or array. No special rescue disks or arduous data restoration processes are required to facilitate recovery.
- **Around the Clock Protection.** Casper enables complete system backups to be performed at any time without leaving Windows, so there is never a need to restart or interrupt the operation of a server to create a backup. In addition, features such as integrated scheduling and SmartAlert technology permit backups to be performed completely unattended in the background for true “set it and forget it” operation.

# Getting Started

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This User Guide is intended to provide you with an overview of the basic operations of Casper. Additional information regarding Casper can be found in the help file or in one of the following supplementary guides:

**Casper SmartStart™ Guide:** This guide provides an overview of Casper SmartStart. You should refer to this guide when you want to maintain a complete backup for a server's system disk or when you want to replace the server's system disk with a new disk to increase speed or storage capacity.

**Casper SmartRestore™ Guide:** This guide provides an overview of Casper SmartRestore. You should refer to this guide when you need to restore a backup.

**Casper Startup Disk Creator Guide:** This guide provides instructions for creating a Casper Startup Disk, which may be required to restore a backup to the server's system drive.

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## System Requirements

- Windows Server 2012 R2, Windows Server 2012, Windows Server 2008 R2, Windows Server 2008, Windows Server 2003 R2, Windows Server 2003, Windows 8.x, Windows 7, Windows Vista, or Windows XP (SP3) <sup>1</sup>
- 500MB available disk space
- 512MB RAM (1GB or more recommended)
- Backup device (additional internal or external hard disk drive)

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<sup>1</sup> Casper Server Edition is not designed for use with Windows Server for Itanium-based systems or Windows NT. Background copying not supported on Windows 2000 or Windows 2000 Advanced Server. Disk image file backups are supported only when running on Windows Server 2008 and later or when booting and running from the Casper Server Edition Startup Disk. The VHDX image file format is supported only when running on Windows Server 2012 and later or when booting and running from a Casper Server Edition Startup Disk created with the Windows 8.x ADK. Booting from a USB connected hard disk requires a computer with BIOS or UEFI firmware support for booting from USB hard disk drive (USB-HDD) devices. Not all computers support booting and running from USB hard disk type devices. Some computers equipped with both USB 3.0 and USB 2.0 ports will support booting only when the device is connected to a USB 2.0 port.

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## Installing Casper

The Casper installation process takes just a few minutes and an automated Wizard will guide you through the process. The instructions below outline in detail the steps for installing Casper.

1. Start the **Casper Server Edition Setup** program.  
The **Welcome to Casper 8.0 Server Edition Setup Wizard** dialog will appear.
2. At the **Welcome to Casper 8.0 Server Edition Setup Wizard** dialog, click **Next**.  
The **End-User License Agreement** will appear. In order to proceed with the installation of Casper, you must agree to the terms of the license that is displayed.
3. Read the End-User License Agreement, select **I accept the terms in the License Agreement**, and then click **Next**.  
The **Select Installation Folder** dialog will appear.
4. Choose the installation folder for the Casper program files and click **Next**.  
The **Configure Shortcuts** dialog will appear.
5. Select additional shortcut locations for the Casper program and click **Next**.  
The **Ready to Install** dialog will appear.
6. Click **Install**.  
The Casper files are added to your system and the **Completing the Casper 8.0 Server Edition Setup Wizard** dialog will appear.
7. Click **Finish** to finalize the installation process.

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## Running Casper

In Windows 8, select **Casper 8.0** from the Windows **Start** screen. In Windows 7 and earlier versions, follow this procedure

1. Click the **Start** button.
2. Click **All Programs**.
3. Point to the **Casper 8.0** menu.
4. Click **Casper 8.0**.

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## Getting Help

For additional assistance, including troubleshooting information, please refer to the help file included with the program. To access help when running Casper, select **Contents** from the **Help** menu, or press **F1**.

Additional support for Casper is also available on the Future Systems Solutions Web site at <http://support.fssdev.com>.

# Using Casper

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Casper Server Edition makes it easy to upgrade or maintain a backup of a Windows server system disk device, as well as other hard disks used on a server

When you use Casper to clone a disk, Casper creates a snapshot, representing a single point-in-time view of the disk, and then copies it to another disk. The result is another disk that can be used as an immediate and complete replacement for the original disk.

When you use Casper to create an image of a disk, Casper creates a snapshot of the disk and then copies it to a file. The result is a file representing a point-in-time image of the disk, which can be used later to restore the disk to the same state it was in when the image was created.

Casper SmartSense™ technology will begin the process of upgrading or creating a backup of your Windows system disk automatically when you attach a new disk to the computer. If the new disk is installed internally, or if Casper SmartSense is unable to detect the new disk, you can manually launch Casper SmartStart™ to begin the process. For more information about using Casper SmartStart to upgrade or maintain a backup of a Windows system disk, please refer to the **Casper SmartStart Guide**.

To upgrade or maintain a backup for another disk on the computer, or customize the upgrade or backup process of the Windows system disk, you should refer to this Casper User Guide or the Casper Help file included with the Casper program. See **Getting Help** for more information.

You can use Casper to maintain bootable backups and restore-point backups for the computer. Both provide unique recovery capabilities that you should consider before proceeding.

## ***Bootable Backups***

A bootable backup represents a separate backup device that you can use to temporarily boot and run the server in an emergency or that you can use as an immediate and permanent replacement for the server's system disk device. A bootable backup is sometimes referred to as a clone backup because it maintains a duplicate copy ("clone") of the system disk device.

Bootable backups provide the advantage of instant recovery because a separate data restoration process is unnecessary. Recovery is simply a matter of restarting the server from the bootable backup. For example, if the server's system disk device fails or becomes corrupted, you can permanently replace it with the bootable backup or temporarily change the server's boot sequence to designate the bootable backup as the preferred boot device.

Bootable backups also provide you with immediate access to all of the files and data. For example, you can use Windows File Explorer to retrieve a specific file or folder directly from the backup without having to separately mount the backup or extract files or folders from the backup.

Because a bootable backup represents a single, point-in-time copy of the Windows system disk device, it provides you with the ability to recover only a single point-in-time. For example, the backup will contain only those files and folders that were present on the server's system disk device when the backup was created or last updated. Each time you update a bootable backup, the prior contents of the backup are replaced with the current contents of the system disk device.



Using two or more separate disk devices to maintain additional bootable backups in a backup rotation is necessary when additional point-in-time backups are desired. This practice is also recommended to provide redundancy from backup corruption, which can occur when a bootable backup is interrupted during an update.

When relying strictly on a bootable backup to protect a server, it is good practice to rotate the backup disk device between each successive backup. For example, if you update the bootable backup weekly, you might use two separate disks to maintain two independent bootable backups for the server. On the first week, you would back up the server to the first backup disk. On the second week, you would back up the server to the second backup disk. On the third week, you would back up the server to the first backup disk again, and so on. In this way, should a problem develop with one of the backups, you can still fall back to the older backup to recover.

Using Casper to create and maintain a bootable backup for a server requires another disk device large enough to accommodate all of the data on the server's current system disk device. A second internal hard disk, or one mounted in a removable (mobile) drive bay is ideal. If the server supports booting from eSATA or USB hard disk type devices, using an external hard disk for the backup is also ideal.

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**NOTE:** For a hard disk attached as an external USB device, booting from the backup hard disk may require the selection of additional BIOS or EFI Firmware options to completely enable booting. By default, some BIOS implementations disable USB boot support, or have it configured for floppy or ZIP drive emulation rather than hard disk drive (HDD) emulation. *If the computer's BIOS or EFI Firmware does not support booting from external USB hard disk type devices, a bootable backup hard disk must be removed from its external enclosure and installed as a replacement for the internal hard disk in order to boot from it.* Alternatively, a restore may be performed by using the Casper Startup Disk to copy the external backup hard disk to the computer's internal hard disk.

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## ***Restore-Point Backups***

A restore-point backup represents a collection of separate backups stored on a single storage device that you can use to restore the server's system disk device to a previous point-in-time. A restore-point backup is also known as an image backup because it consists of one or more image files, each corresponding to the state of the server's system disk device at the time the image was created.

Because multiple restore-points may be maintained on a single backup device, restore-point backups provide additional recovery options that are not available when using a bootable backup. For example, if the server's system disk device fails or becomes corrupted, you can restore the system disk device to any one of the restore-points you have created. Likewise, when only a specific file or folder needs to be restored, you can choose a specific restore-point from which to retrieve the file or folder.

Unlike a bootable backup, a restore-point backup will not overwrite or replace any other data stored on the backup device. For example, the backup device for a restore-point backup can be almost any disk, including a disk that already contains other files.

Using Casper to create and maintain a restore-point backup for a server requires a storage device with free space that is at least several times greater than the amount of used space on the server's system disk device. An external USB or eSATA connected storage device with the prerequisite amount of free space is often ideal for maintaining restore-point backups. While the exact amount of free space depends on several factors, usually about three times the amount of used space on server's system disk device is enough free space for Casper to create and maintain multiple restore-points for a restore-point backup. For example, if 150GB represents the current amount of used space on the server's system disk device, using a storage device with approximately 450GB of free space is generally sufficient to maintain a restore-point backup with a good variety of restore-points.

As with a bootable backup, when relying strictly on restore-point backups to protect a server, it is good practice to rotate the backup device between successive backups. This will help to ensure a viable backup exists in the event one of your backup devices suffers an untimely mechanical failure or data corruption, which might otherwise prevent you from restoring a backup.

Unlike a bootable backup, recovery using a restore-point backup requires a separate restoration step from the Casper Startup and Recovery Environment. For example, to restore the server's system disk device from a restore-point backup, you must boot the server from a Casper Startup Disk to perform the restore. Alternatively, when the Casper Startup and Recovery Environment has been added to the backup device, you can boot the server directly from the backup device to perform the restore. In most instances, Casper's SmartRestore™ technology will fully automate the restoration process for you. For details on creating a separate Casper Startup Disk, please see the **Casper Startup Disk Creator Guide**.

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**NOTE:** Restore-Point Backups require the Casper Disk Imaging feature, which is available only on computers running Windows 7 and later.

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## ***Choosing a Backup Type***

For the greatest level of protection, maintaining a combination of bootable backups and restore-point backups on multiple devices in rotation is ideal. When this is not possible, the type of backup you choose to maintain will depend greatly on your specific situation and recovery needs. For a server whereby minimizing downtime is of utmost importance, maintaining two or more bootable backup disk devices in rotation is often preferable to a restore-point backup.

The following table summarizes the differences between the two backup types.

## Comparison of Bootable Backups and Restore-Point Backups

	Casper Bootable Backup	Casper Restore-Point Backup
Contains a complete backup of the server's system disk device?	Yes	Yes
Can be used to boot and run server if necessary?	Yes	No
Can be used to recover just one or more files?	Yes	Yes
Provides multiple restore points?	No	Yes
Type of storage device required	Dedicated internal or external hard disk device	Internal or external storage device
Other data can be stored on the backup storage device	No. Backup completely replaces existing content of storage device.	Yes. Backups can coexist with other new and existing files and folders on storage device.
Size of storage device required	Large enough to accommodate all of the data currently on server's system disk	Free space equal to three times the amount of used space on server's current system disk device

# Creating and Maintaining a Bootable System Backup

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Using Casper to create and maintain a bootable backup replacement disk for a Windows server requires a hard disk or secondary RAID array large enough to accommodate all of the data on the server's current system disk device.

A second internal hard disk, or one mounted in a removable (mobile) drive bay is ideal. If the server supports booting from eSATA or USB hard disk type devices, using an external hard disk for the backup is also ideal.

The following examples illustrate various ways to create and maintain a bootable backup of a server's system disk device.

**Example 1: Creating a Bootable Backup.** This example demonstrates how to initialize a new disk or secondary RAID array for use as a complete backup replacement for the server's system disk device.

**Example 2: Updating a Bootable Backup.** This example shows how to manually update an existing bootable backup of the server's system disk device.

**Example 3: Automating a Bootable Backup.** This example illustrates how to fully automate a bootable backup.

**Example 4: Automating a Bootable Backup to a Portable Device.** This example shows how to automate a bootable backup maintained on a portable disk such as a USB, Firewire, or eSATA connected disk.

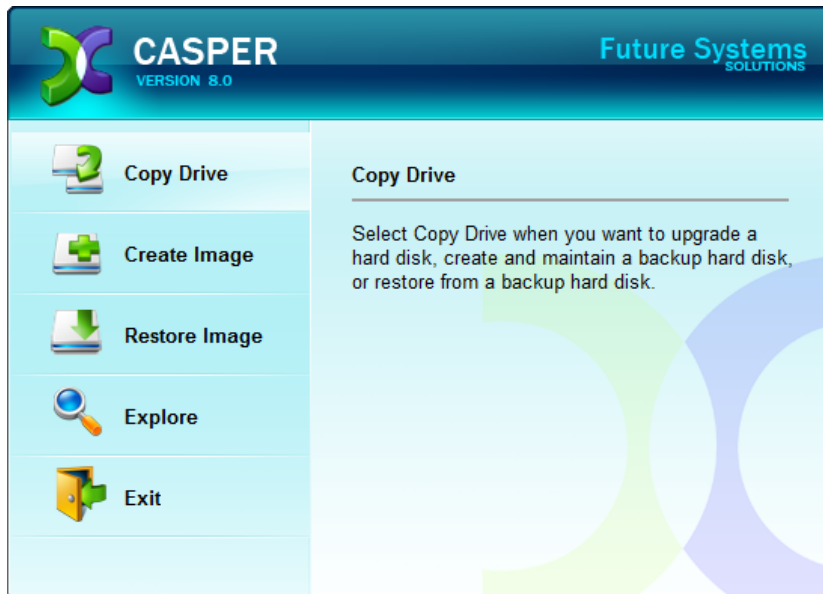
**Example 5: Performing a Bootable Backup On-Demand.** This example demonstrates how to create a desktop shortcut to maintain a bootable backup on-demand.

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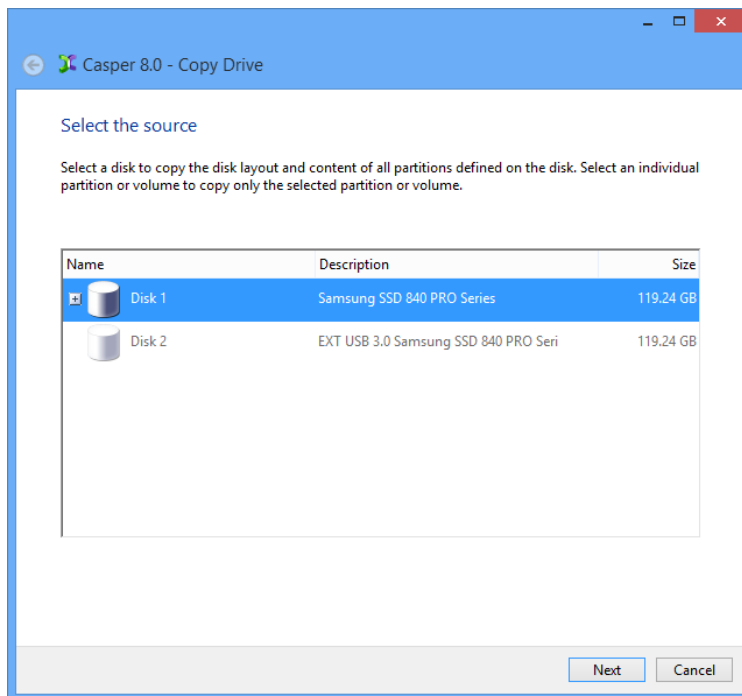
## Example 1: Creating a Bootable Backup

Assuming the backup disk device is currently installed or attached to the system, the following procedure illustrates how to clone the server's Windows system disk device to the backup device to produce a bootable backup.

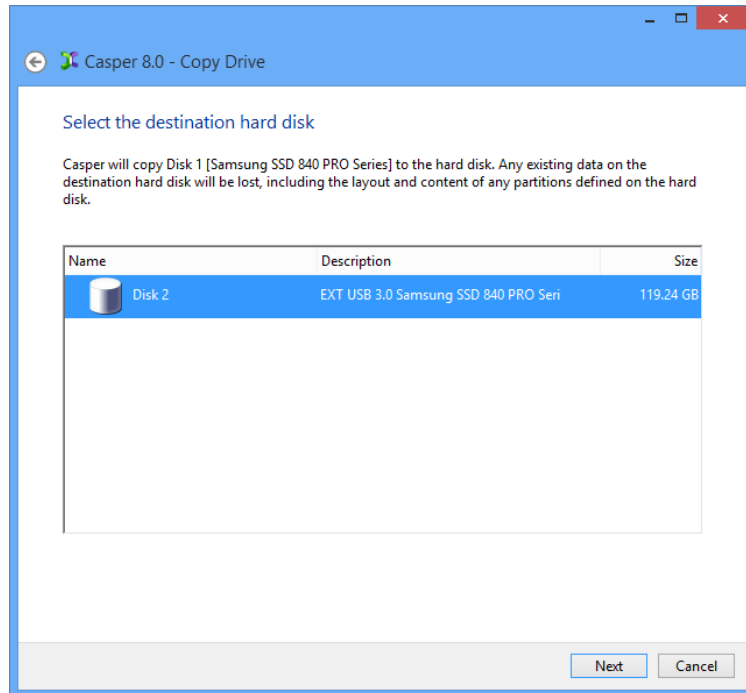
1. Select **Copy Drive**.



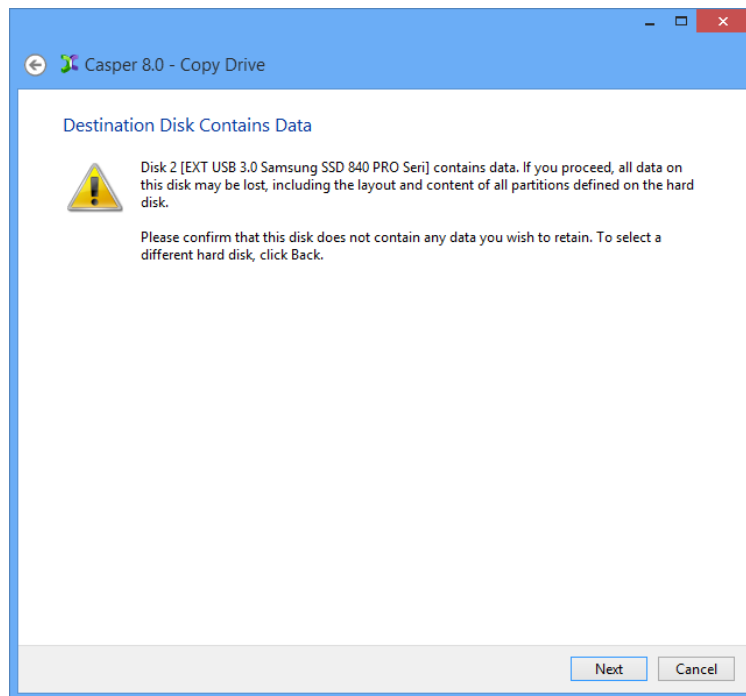
2. Select the disk device to backup (e.g., the hard disk or RAID array on which Windows Server has been installed) as the source, and click **Next**.



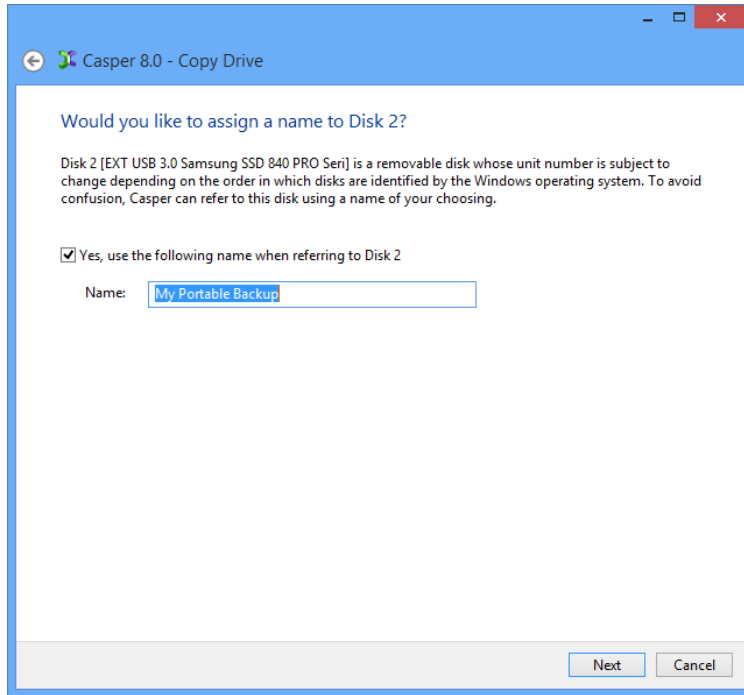
3. Select the backup disk device as the destination, and click **Next**.



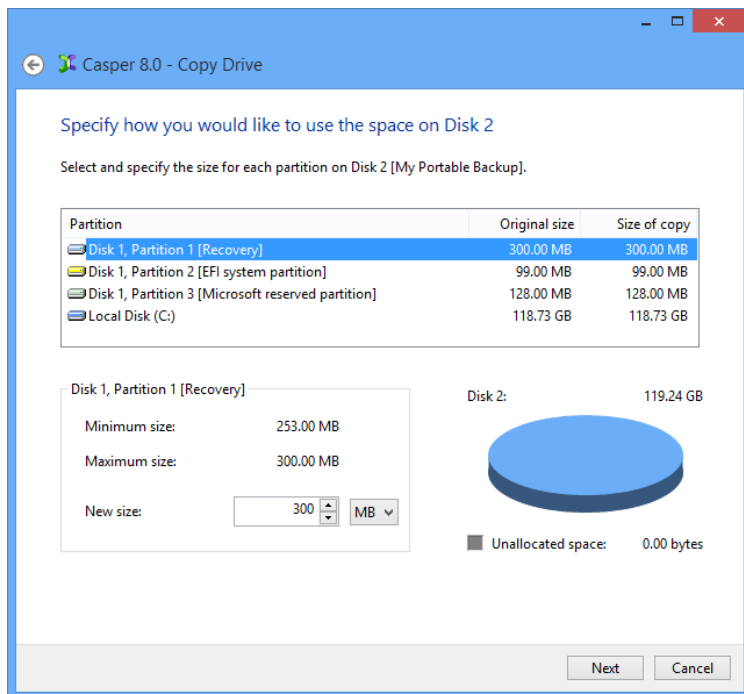
4. If the selected destination device defines a partition or contains data, Casper will warn you that the contents will be overwritten. Confirm you have selected the correct disk device to receive the backup, and click **Next** to proceed.



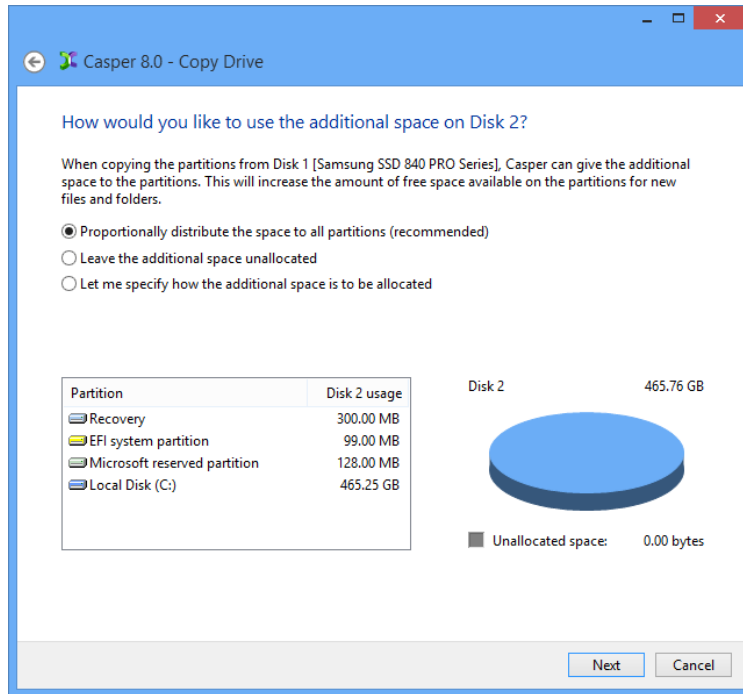
- When selecting an external hard disk as the destination, Casper will prompt you to assign a name to the disk. A name is optional. If you use multiple external hard disks, a name can make it easier to identify which external hard disk is being used for a Casper backup. Click **Next** to proceed.



- When prompted to specify how the space on the backup device is to be used, retain the default selection and click **Next**. If the destination device is the same size or smaller than the source device, Casper will ask you to manually configure how the space is to be used.

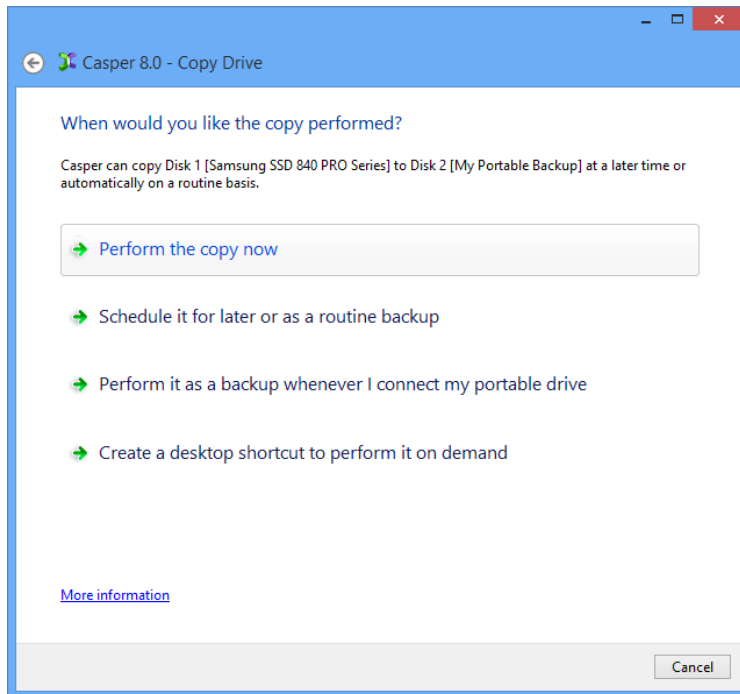


When the destination device is larger than the source, the default option will be *Give all of the space to the partition*, or *Proportionally distribute the space to all partitions* when there is more than one partition defined on the source device.



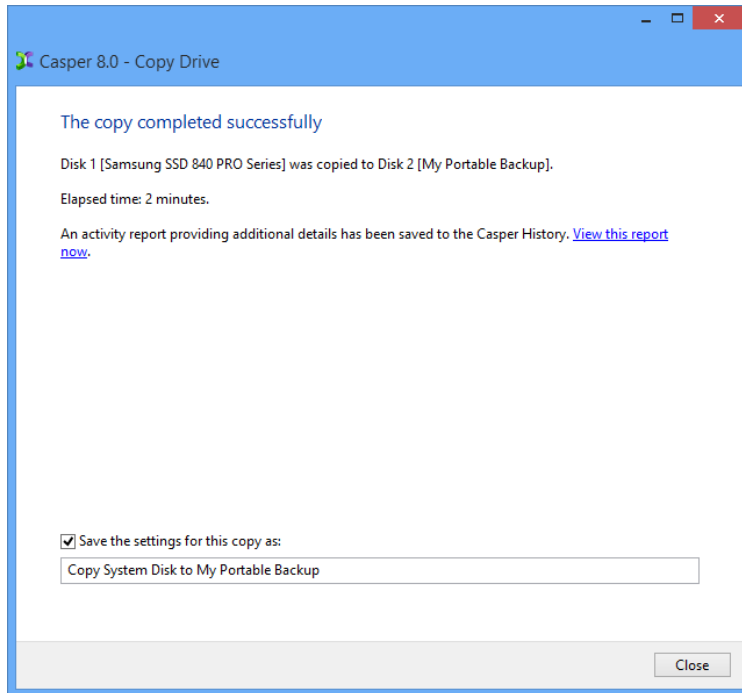
Simply clicking **Next** to accept the default selection or value is generally best. For additional help with making a selection, press **F1**.

7. Click **Perform the copy now** to begin the cloning process.





8. When Casper has completed the cloning process, click **Close**.



---

## Example 2: Updating a Bootable Backup

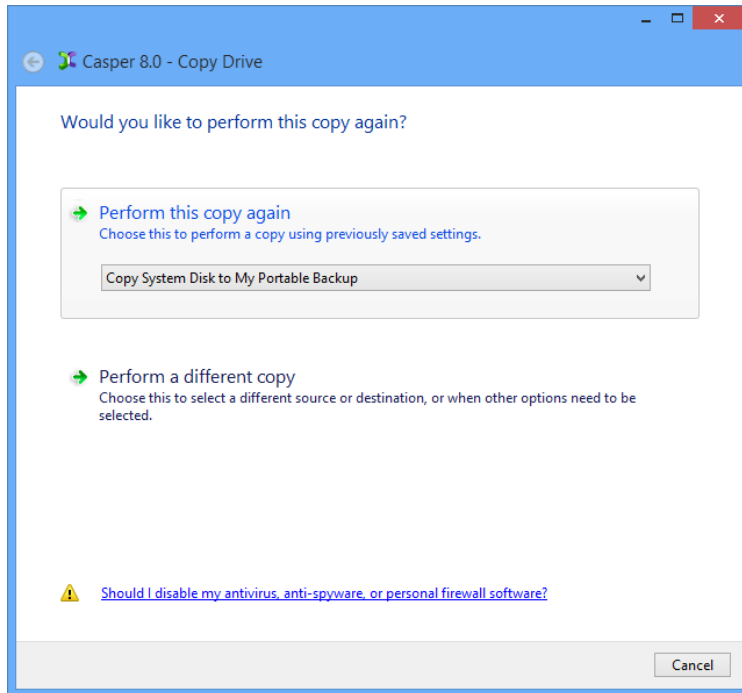
You can manually update a bootable backup by repeating the procedure used to create the backup. When the settings for the copy have been saved as shown in the final step of the preceding example, Casper makes this process even easier. Assuming the backup device is currently installed or attached to the system, the following two procedures illustrate how a prior copy may be quickly repeated to update an existing bootable backup.

### Updating a Bootable Backup via *Perform this copy again*

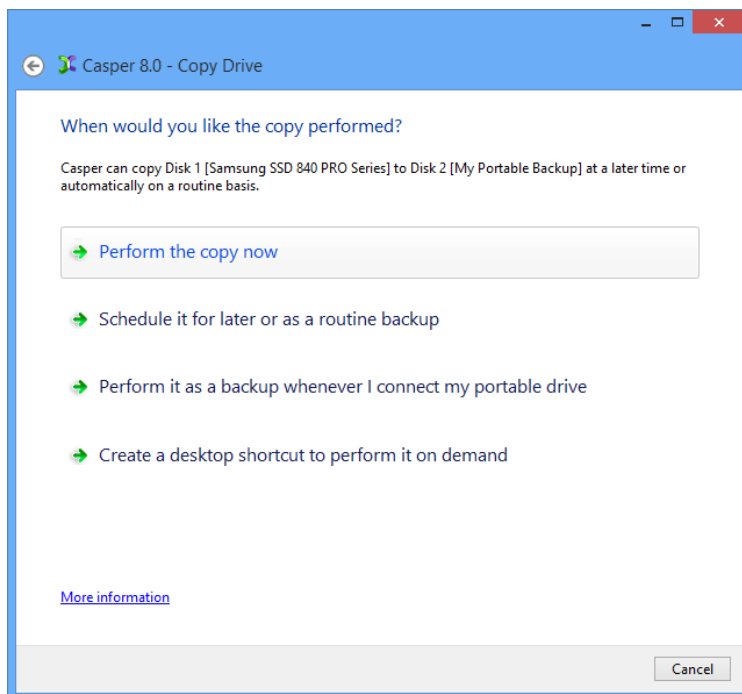
1. Select **Copy Drive**.



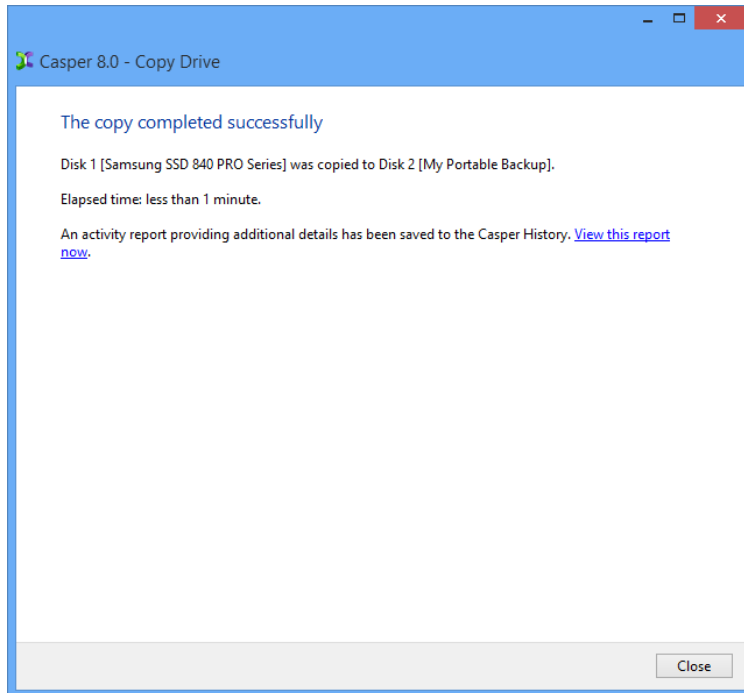
2. Select the copy to be repeated from the list provided and click **Perform this copy again**.



3. Click **Perform the copy now** to begin the cloning process.

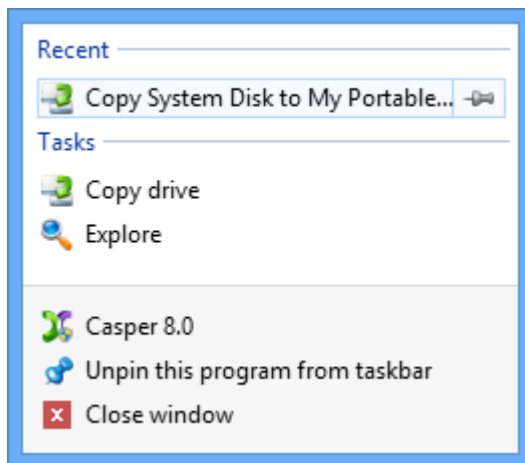


4. When Casper has completed the cloning process, click **Close**.

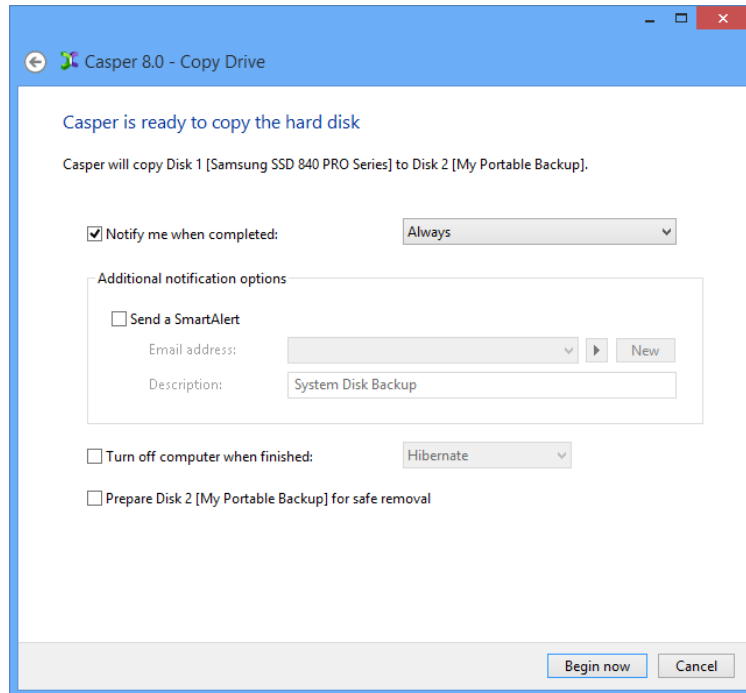


## Updating a Bootable Backup via the Casper Taskbar Icon (Windows Server 2008 and later)

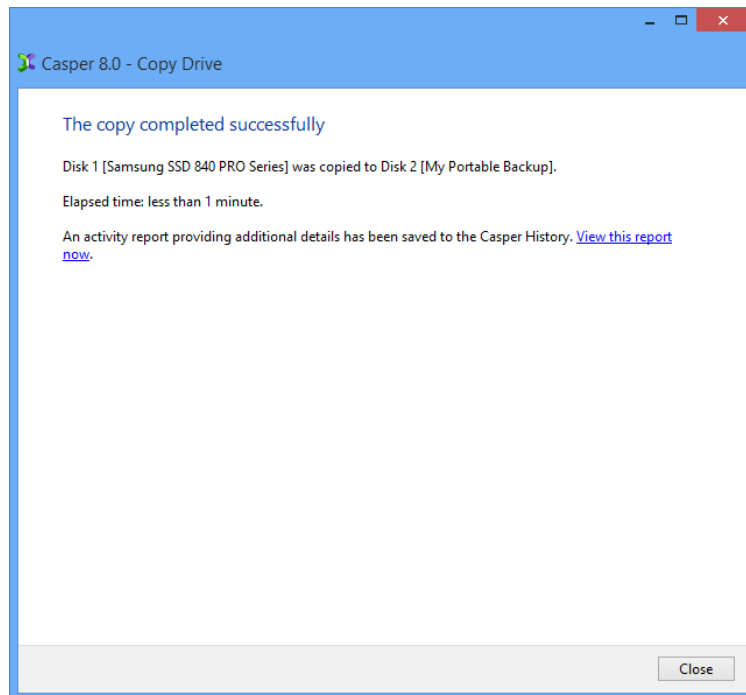
1. Right-click the Casper icon appearing on the Windows taskbar to display the icon's taskbar menu.
2. Click the copy to be performed again from the **Recent** list.



3. Click **Begin now** to begin the cloning process.



4. When Casper has completed the cloning process, click **Close**.

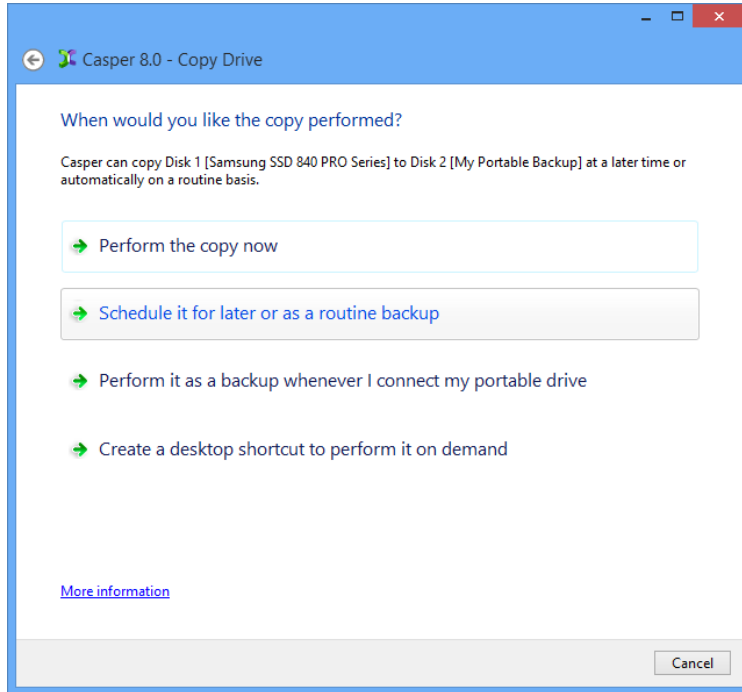


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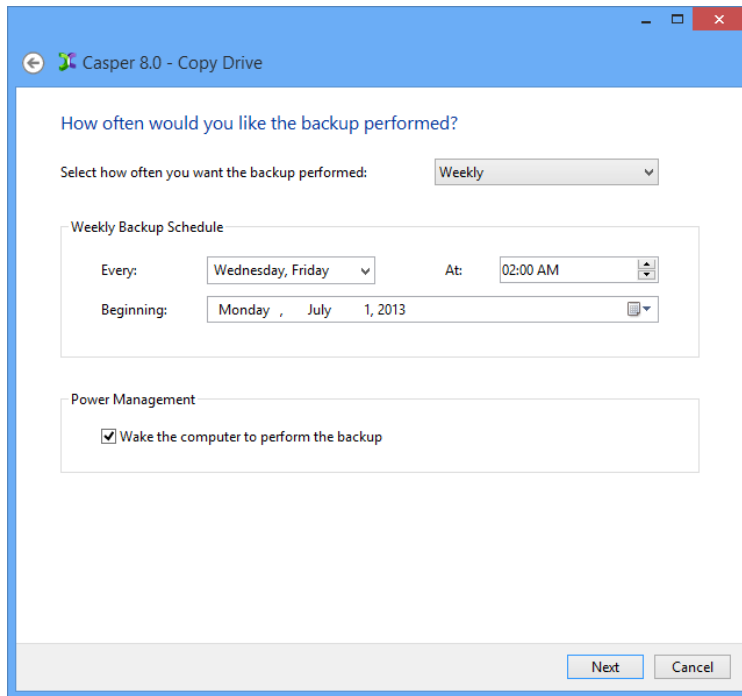
## Example 3: Automating a Bootable Backup

You can fully automate the process of creating and maintaining a bootable backup for a server by scheduling Casper to run on a routine basis. The procedure outlined below is the same whether you are performing an initial backup as demonstrated in Example 1 or updating an existing backup as demonstrated in Example 2.

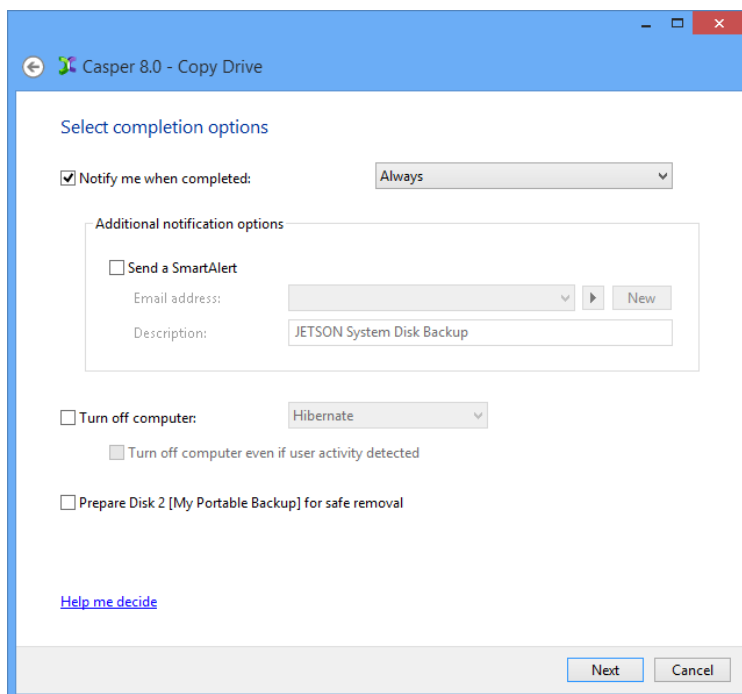
1. When prompted by the Copy Drive wizard, click **Schedule it for later or as a routine backup**.



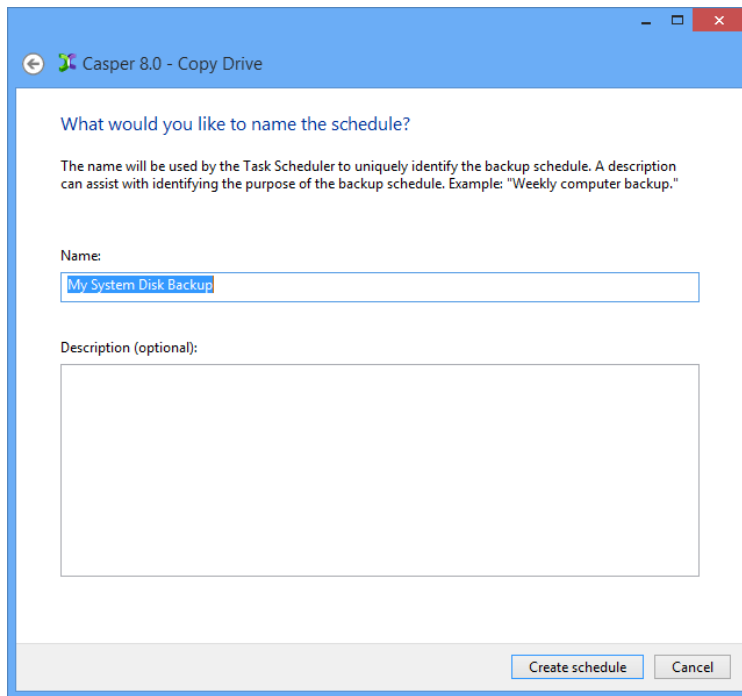
2. Select the schedule you would like Casper to follow to maintain the backup, and click **Next**. For help with the schedule, press **F1**.



3. Select the desired completion options, and click **Next**.



4. Enter a name for the schedule, or retain the name suggested by Casper, and then click **Create schedule** to add the copy schedule to the server's Scheduled Tasks.



Casper 8.0 - Copy Drive

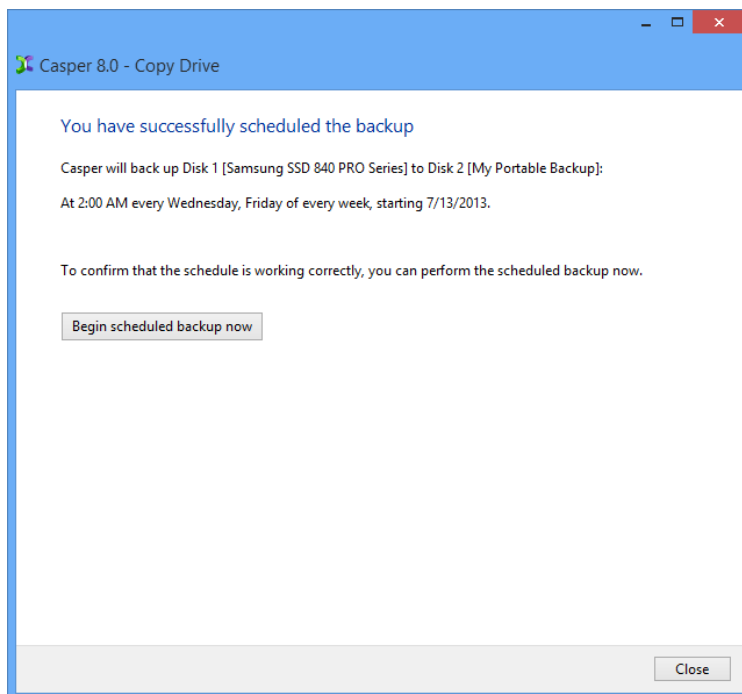
What would you like to name the schedule?

The name will be used by the Task Scheduler to uniquely identify the backup schedule. A description can assist with identifying the purpose of the backup schedule. Example: "Weekly computer backup."

Name:

Description (optional):

5. Click **Close** to return to the Casper console.



Casper 8.0 - Copy Drive

You have successfully scheduled the backup

Casper will back up Disk 1 [Samsung SSD 840 PRO Series] to Disk 2 [My Portable Backup]:  
At 2:00 AM every Wednesday, Friday of every week, starting 7/13/2013.

To confirm that the schedule is working correctly, you can perform the scheduled backup now.



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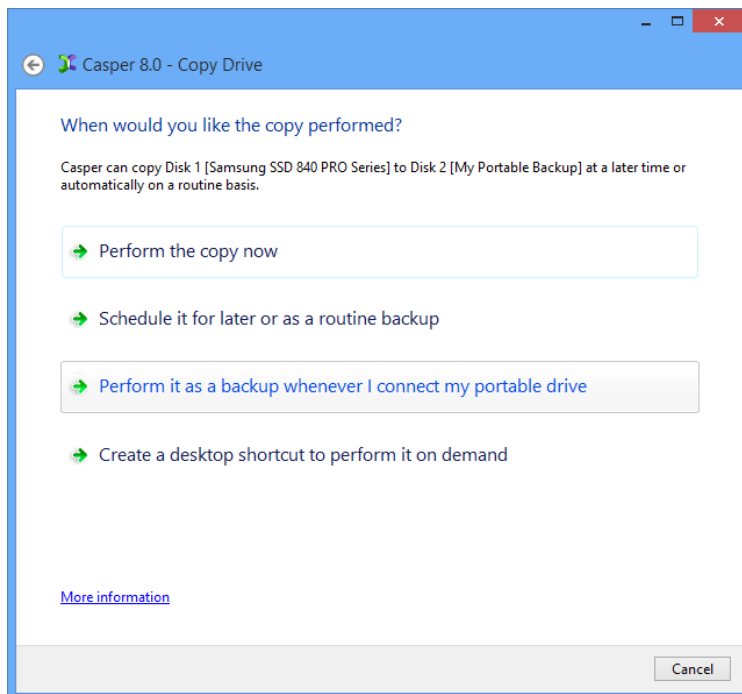
## Example 4: Automating a Bootable Backup to a Portable Device

When using a portable device such as an external USB, Firewire, or eSATA drive for the backup, you can configure Casper to automatically perform a backup whenever you attach the backup device.

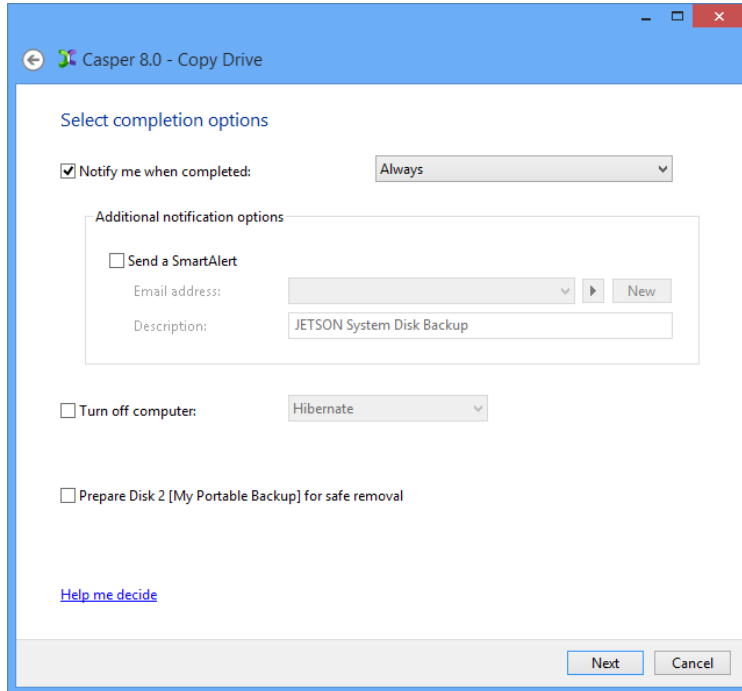
### Configuring a SmartSense Backup

The procedure outlined below is the same whether you are performing an initial backup as demonstrated in Example 1 or updating an existing backup as demonstrated in Example 2.

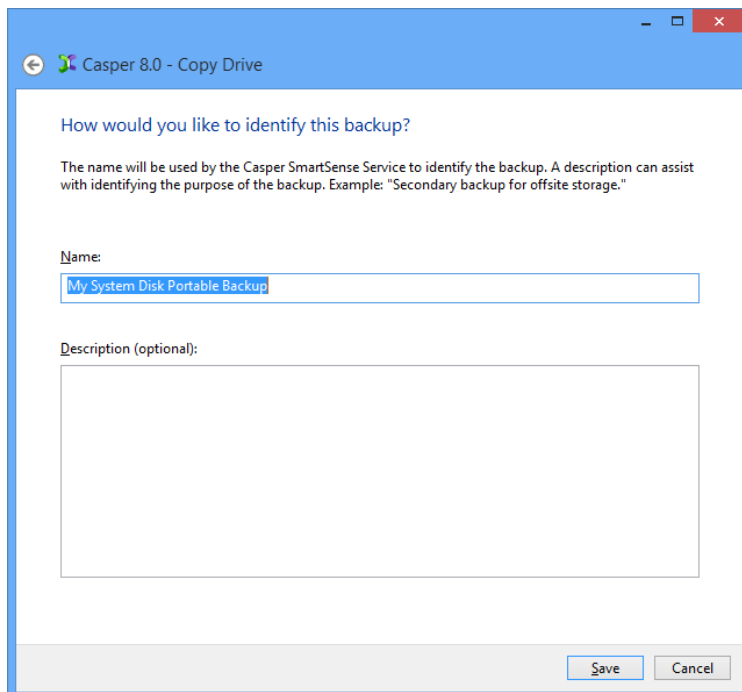
1. When prompted by the Copy Drive wizard, click **Perform it as a backup whenever I connect the portable drive**.



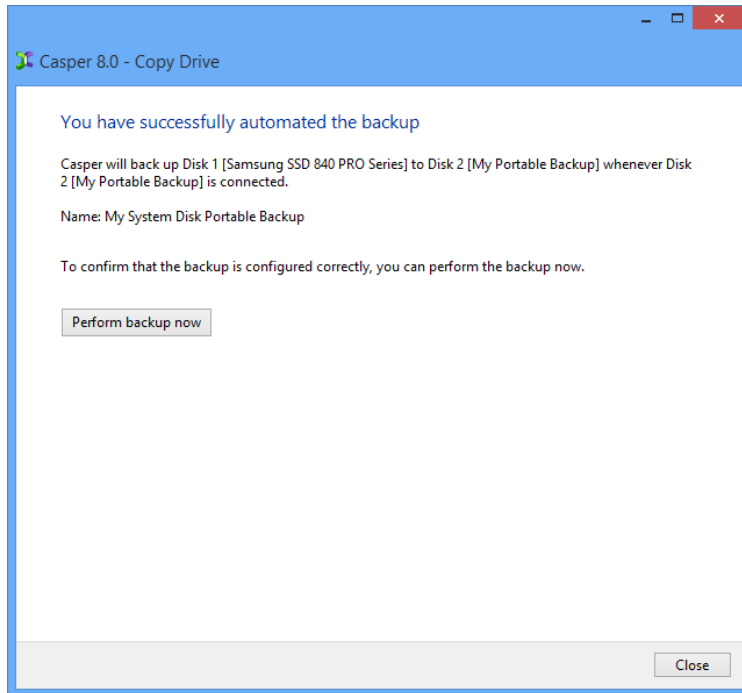
2. Select the desired completion options, and click **Next**.



3. Enter a name to uniquely identify the backup, or retain the name suggested by Casper, and then click **Save** to register the backup with the Casper SmartSense Service.

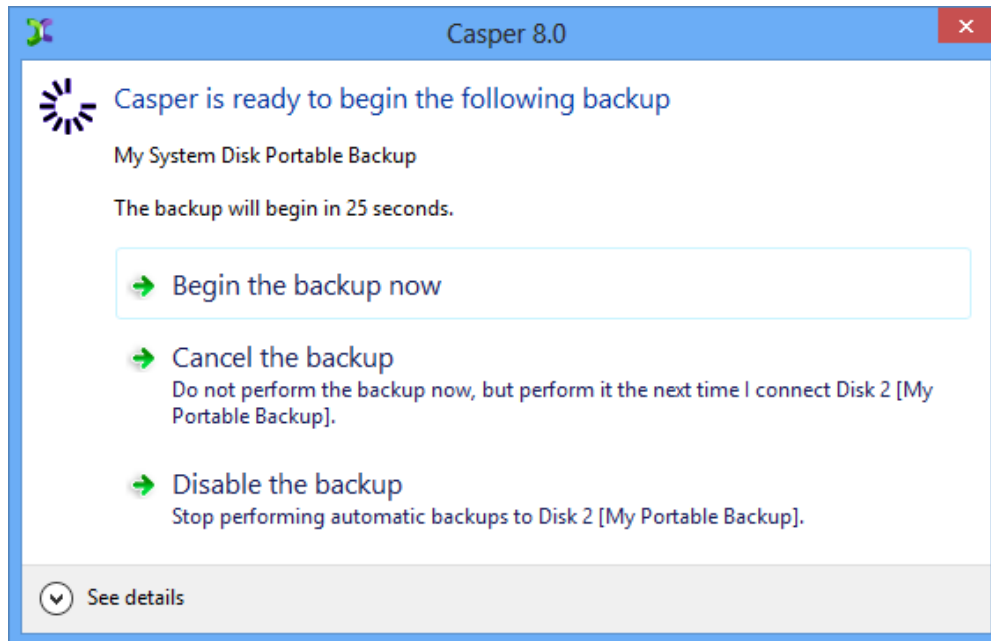


4. Click **Close** to return to the Casper console.



## Starting a SmartSense Backup

Once a portable backup drive has been registered with the Casper SmartSense Service, the backup can be started by simply attaching the portable drive to the server.



The backup will start automatically after a short delay. You can begin the backup immediately by selecting **Begin the backup now**. Click **Cancel the backup** to skip the backup, or **Disable the backup** to skip the current backup and prevent future backups from beginning automatically.

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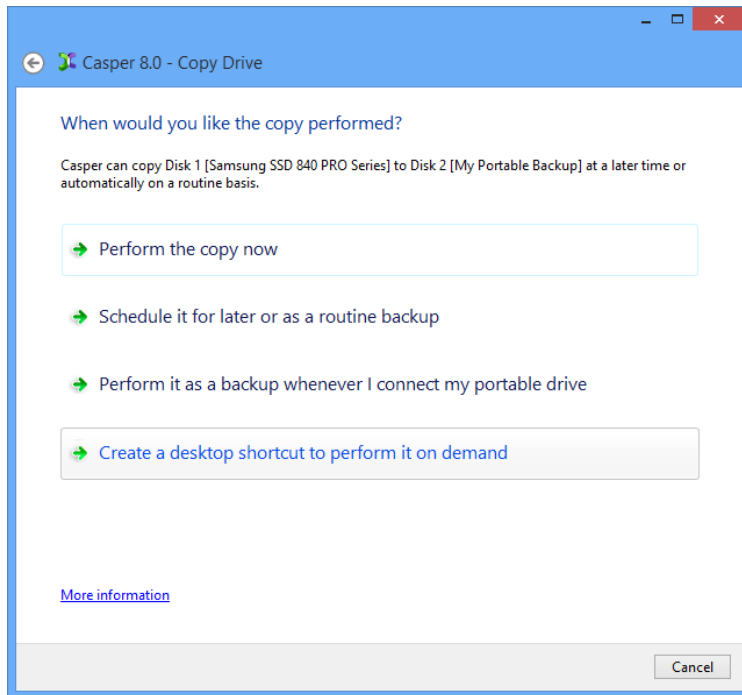
## Example 5: Performing a Bootable Backup On-Demand

You can create a desktop shortcut to perform a bootable backup on-demand.

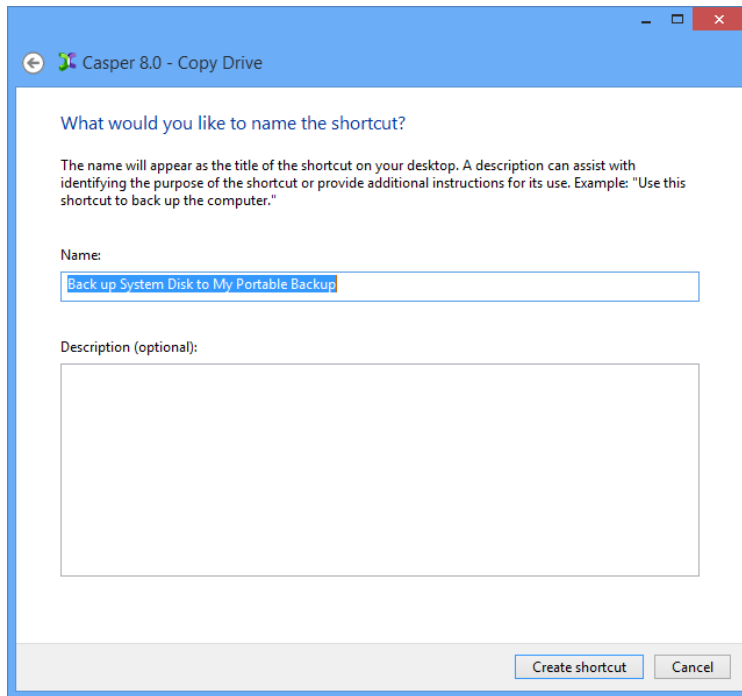
### Creating a Desktop Shortcut for a Bootable Backup

The procedure outlined below is the same whether you are performing an initial backup as demonstrated in Example 1 or updating an existing backup as demonstrated in Example 2.

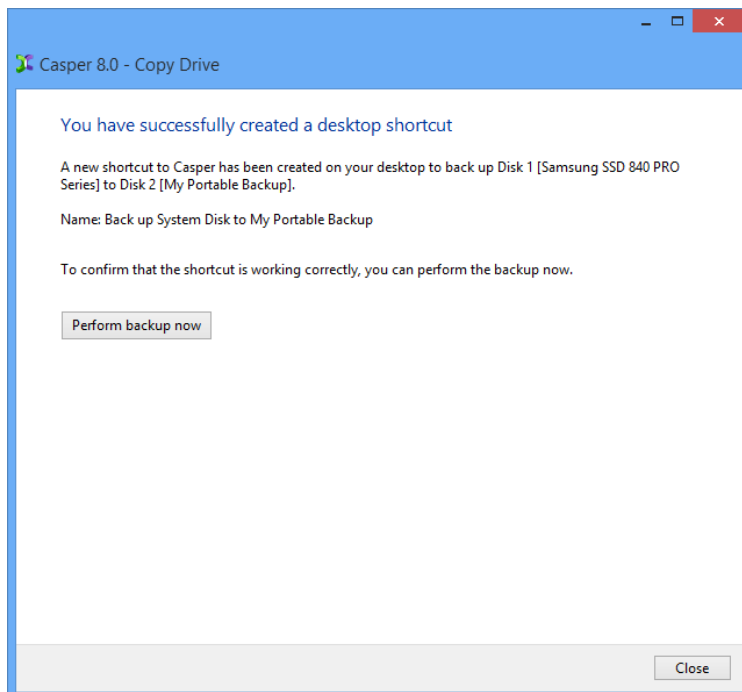
1. When prompted by the Copy Drive wizard, click **Create a desktop shortcut to perform it on demand**.



2. Enter a name for the shortcut, or retain the name suggested by Casper, and click **Create shortcut**.

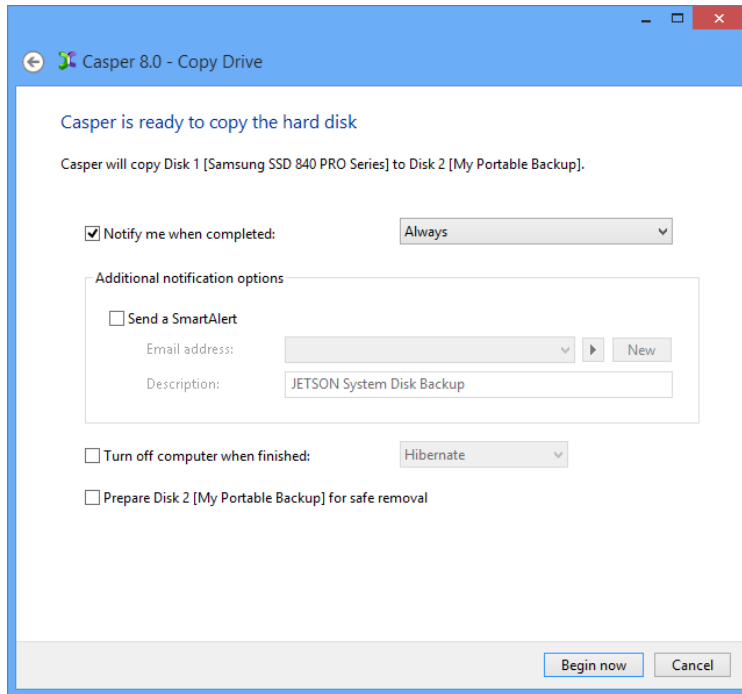


3. Click **Close** to return to the Casper console.



## Performing a Bootable Backup On-Demand

After creating a desktop shortcut, you can use the Casper shortcut appearing on the desktop to begin the backup. Click **Begin now** to start the backup.



# Creating and Maintaining a Restore-Point System Backup

Using Casper to create and maintain a restore-point backup for a Windows server requires a storage device with free space that is at least several times greater than the amount of used space on the server's system disk device. An external USB or eSATA connected storage device with the prerequisite amount of free space is often ideal for maintaining restore-point backups. While the exact amount of free space depends on several factors, usually about three times the amount of used space on the server's system disk device is enough free space for Casper to create and maintain multiple restore-points for a restore-point backup. For example, if 150GB represents the current amount of used space on the server's system disk, using a storage device with approximately 450GB of free space is generally sufficient to maintain a restore-point backup with a good variety of restore-points.

The following examples illustrate various ways to create and maintain a restore-point backup of a server's system disk device.

**Example 6: Creating a Restore-Point Backup.** This example demonstrates how to create a restore-point backup for the server's system disk device.

**Example 7: Updating a Restore-Point Backup.** This example shows how to manually update an existing restore-point backup by creating a new restore point.

**Example 8: Automating a Restore-Point Backup.** This example illustrates how to fully automate a restore-point backup.

**Example 9: Automating a Restore-Point Backup to a Portable Device.** This example shows how to automate a restore-point backup maintained on a portable device such as a USB, Firewire, or eSATA connected disk.

**Example 10: Performing a Restore-Point Backup On-Demand.** This example demonstrates how to create a desktop shortcut to maintain a restore-point backup on-demand.

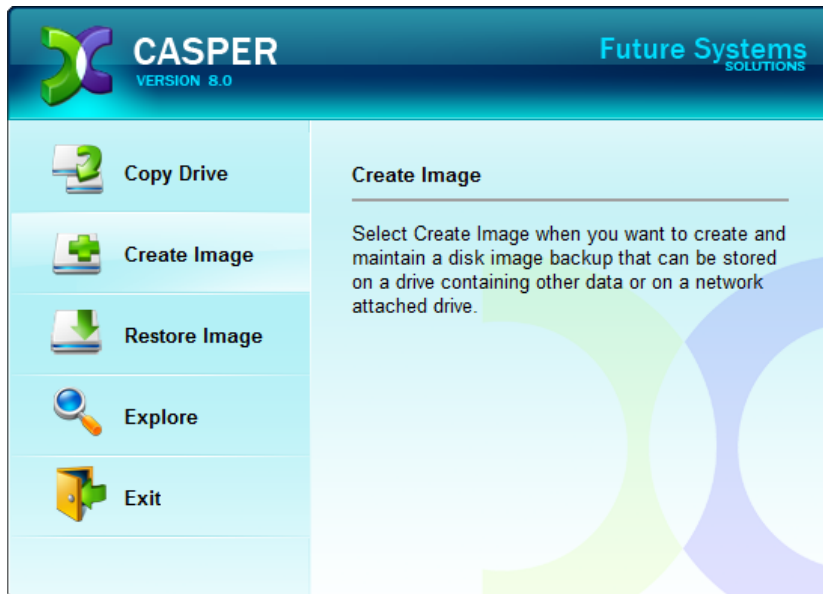


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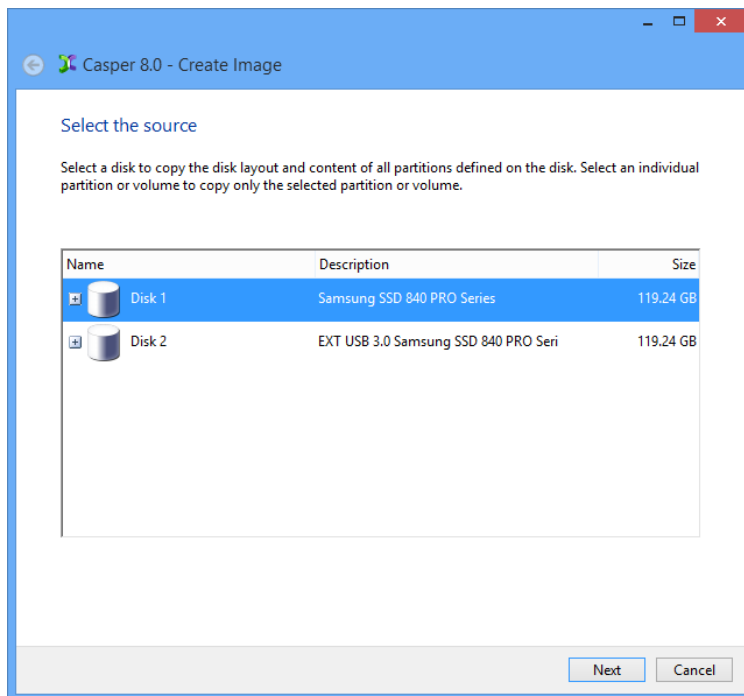
## Example 6: Creating a Restore-Point Backup

Assuming the backup device is currently installed or attached to the system, the following procedure illustrates how to create an image of the server's Windows system disk device to produce a restore-point backup.

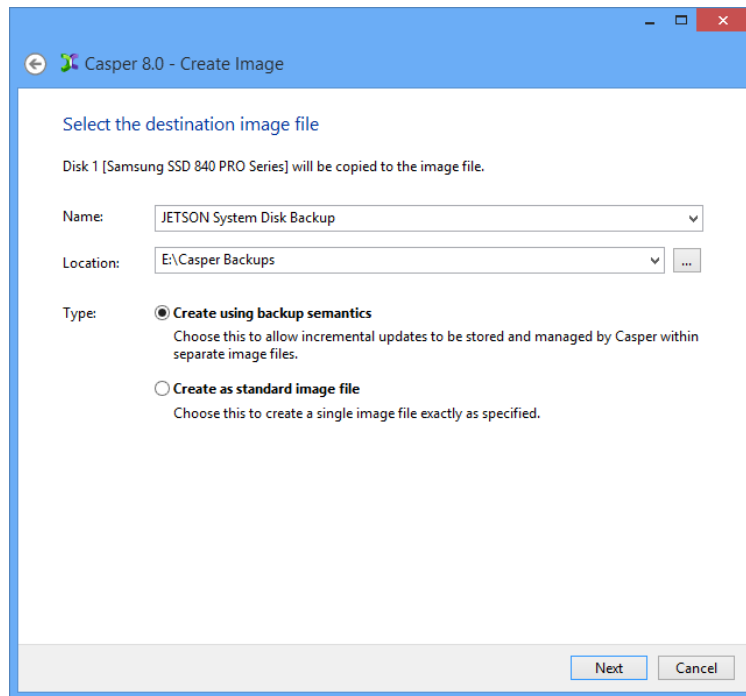
1. Select **Create Image**.



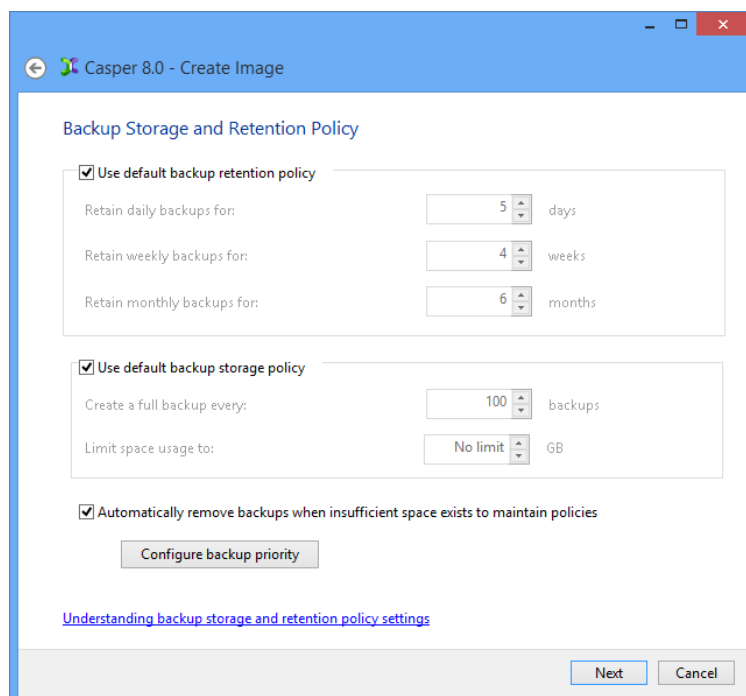
2. Select the disk device to backup (e.g., the hard disk or RAID array on which Windows Server has been installed) as the source, and click **Next**.



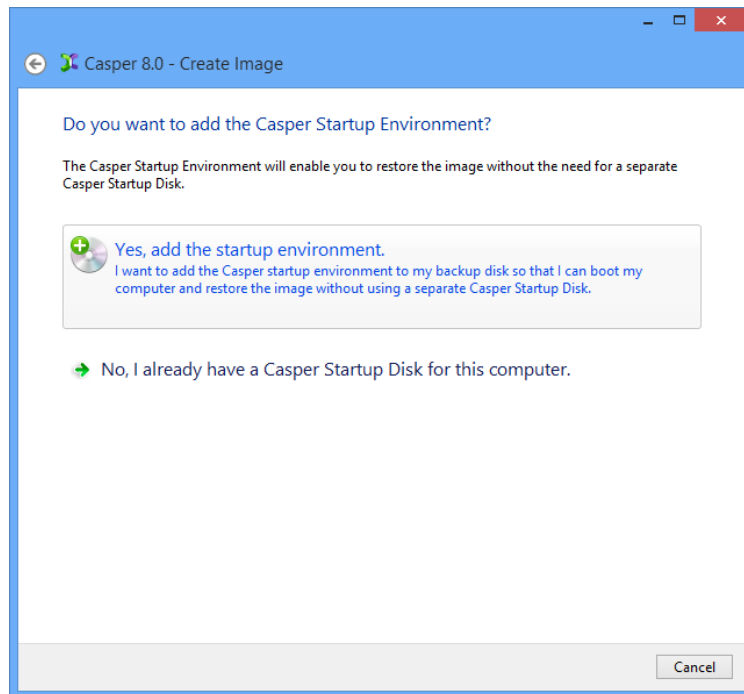
3. Enter a name for the restore-point backup, or retain the name suggested by Casper, and then select the location where the image file(s) will be stored. To allow future restore-points to be managed by Casper, choose **Create using backup semantics** and click **Next**. For additional help, press **F1**.



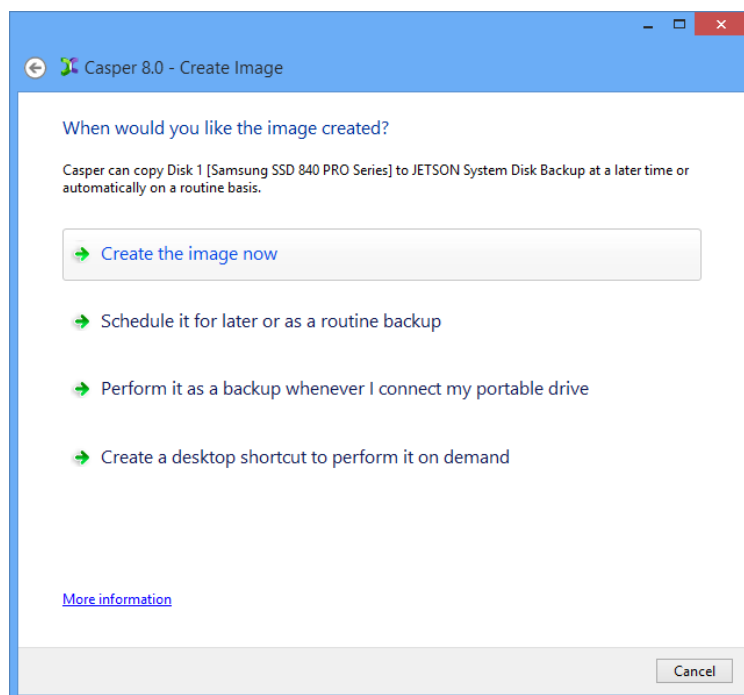
4. When using backup semantics, Casper will prompt you to specify the storage and retention policy for the backup. This policy governs how restore-points are created and managed. It also defines what happens when additional storage space is needed to create a new restore-point. Click **Next** to proceed.



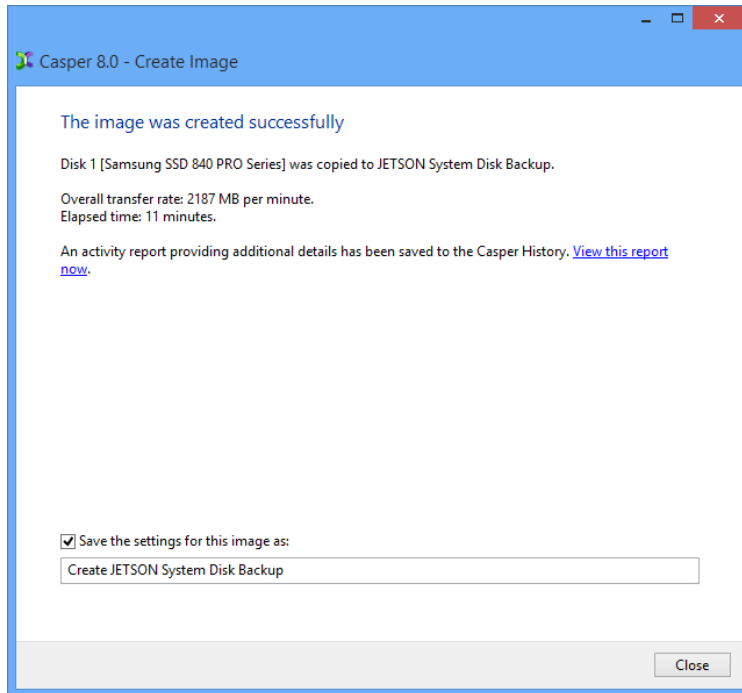
5. If creating an image of the server's system disk on a device that can be used to boot the Casper Startup and Recovery Environment, Casper will offer to add the Casper Startup and Recovery Environment. This eliminates the need to create and use a separate Casper Startup Disk to restore the image. Click **Yes, add the startup environment**.



6. Click **Create the image now** to begin the imaging process.



7. When Casper has completed the imaging process, click **Close**.



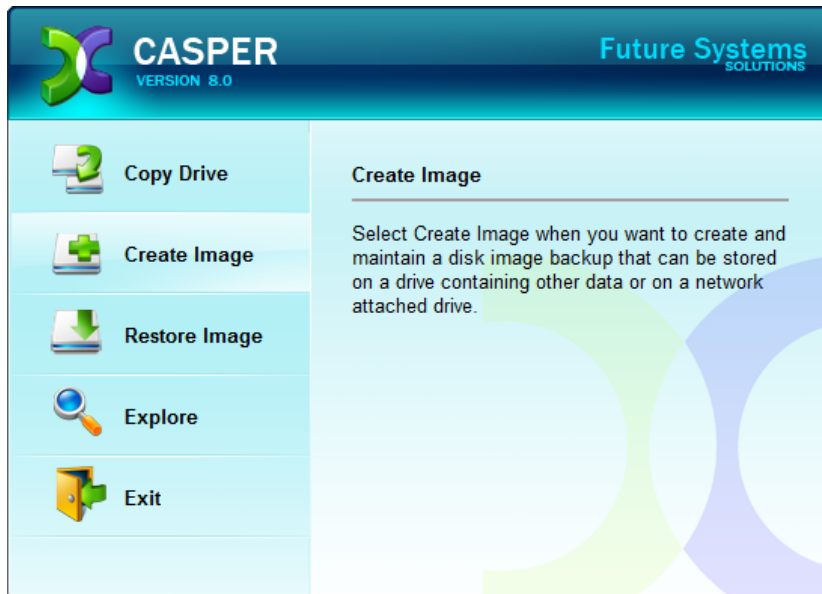
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## Example 7: Updating a Restore-Point Backup

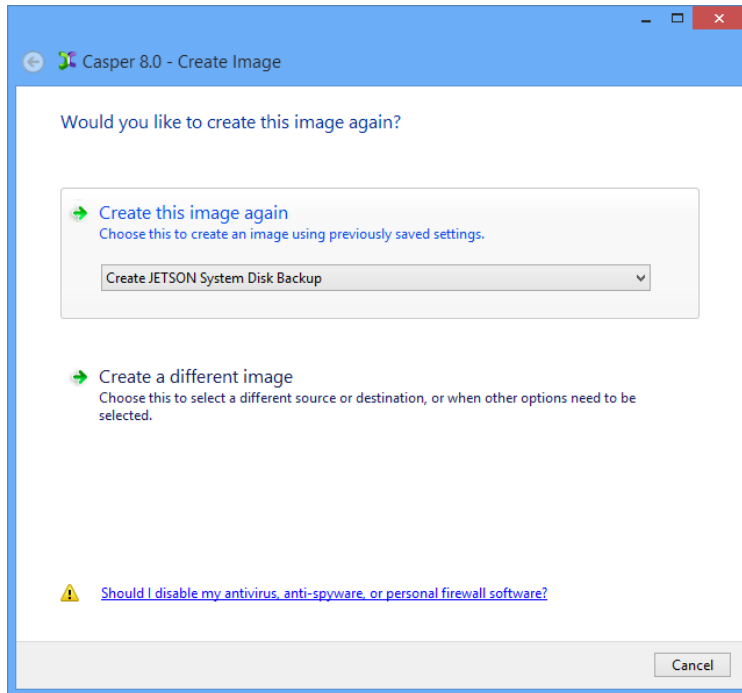
You can manually update a restore-point backup with a new restore-point by repeating the procedure used to create the initial restore-point backup. When the settings for the image have been saved as shown in the final step of the preceding example, Casper makes this process even easier. Assuming the backup hard disk is currently installed or attached to the system, the following two procedures illustrate how to quickly create the image again to produce a new restore-point.

### Updating a Restore-Point Backup via *Create this image again*

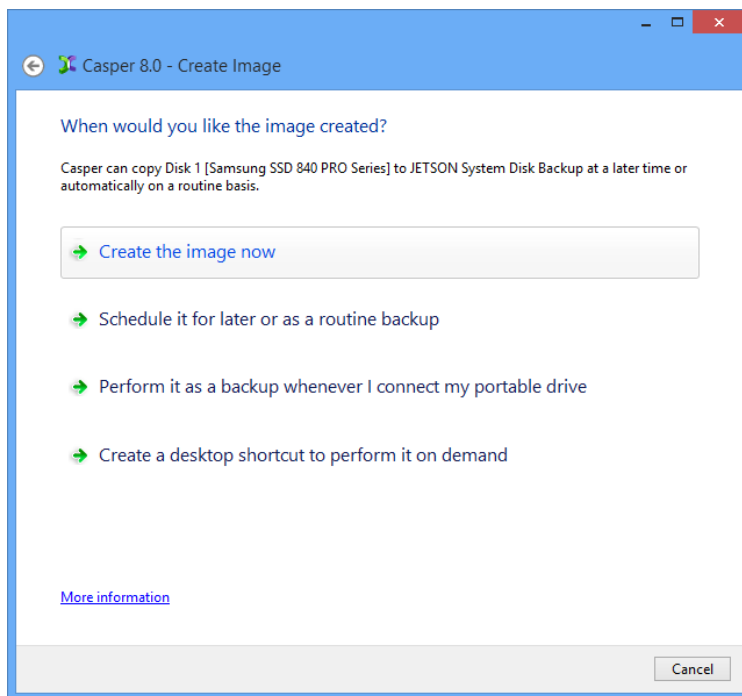
1. Select **Create Image**.



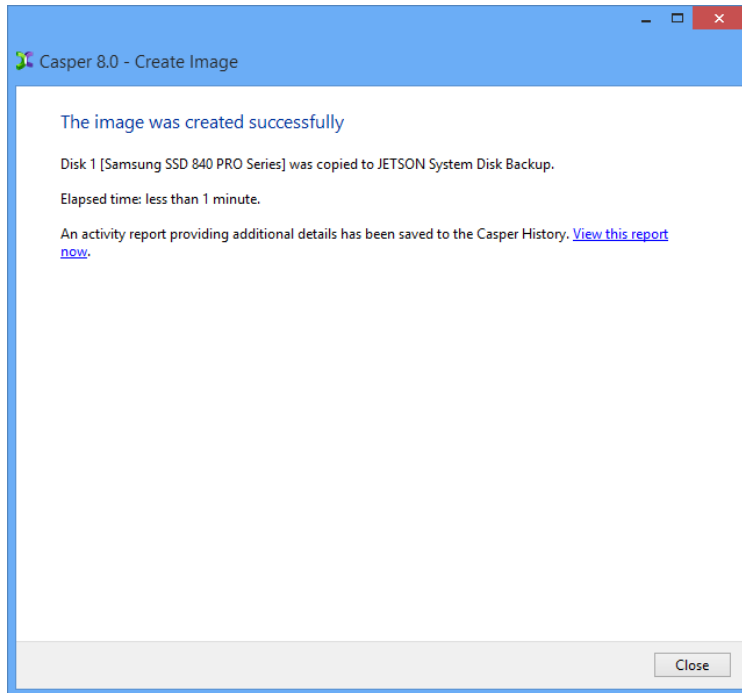
2. Select the image from the list provided and click **Create this image again**.



3. Click **Create the image now** to begin the imaging process.

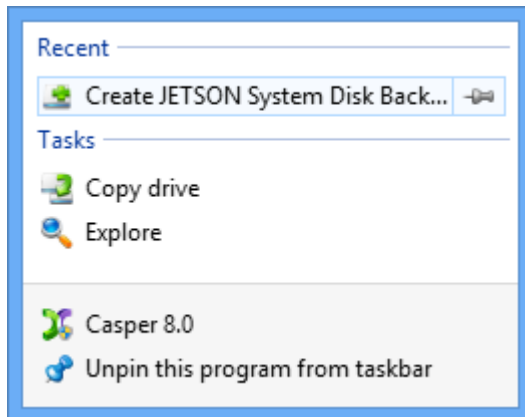


4. When Casper has completed the imaging process, click **Close**.

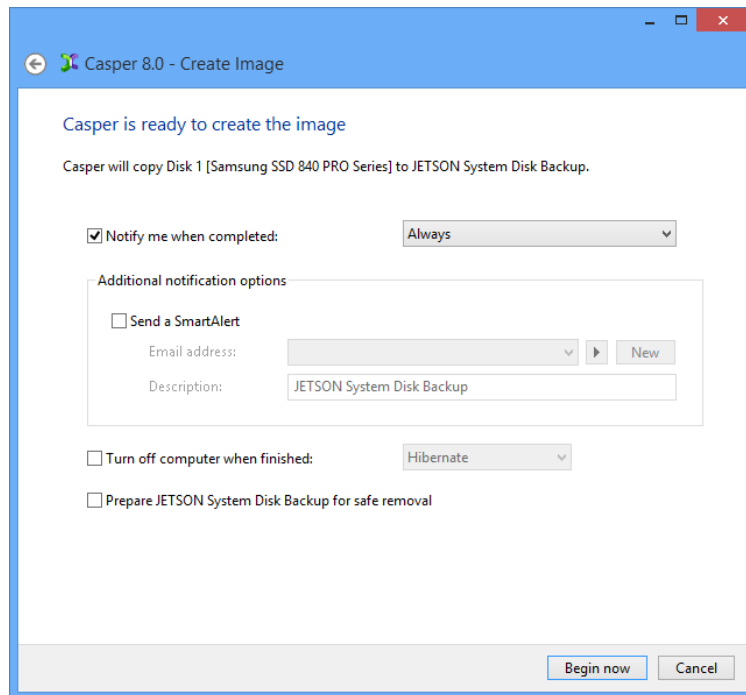


## Updating a Restore-Point Backup via the Casper Taskbar Icon

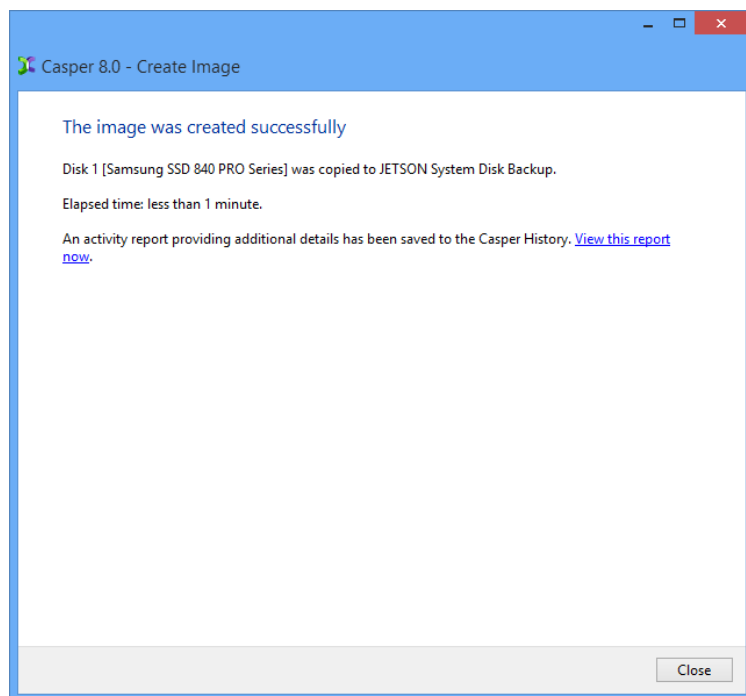
1. Right-click the Casper icon appearing on the Windows taskbar to display the icon's taskbar menu.
2. Click the image to be created again from the **Recent** list.



3. Click **Begin now** to begin the imaging process.



4. When Casper has completed the imaging process, click **Close**.



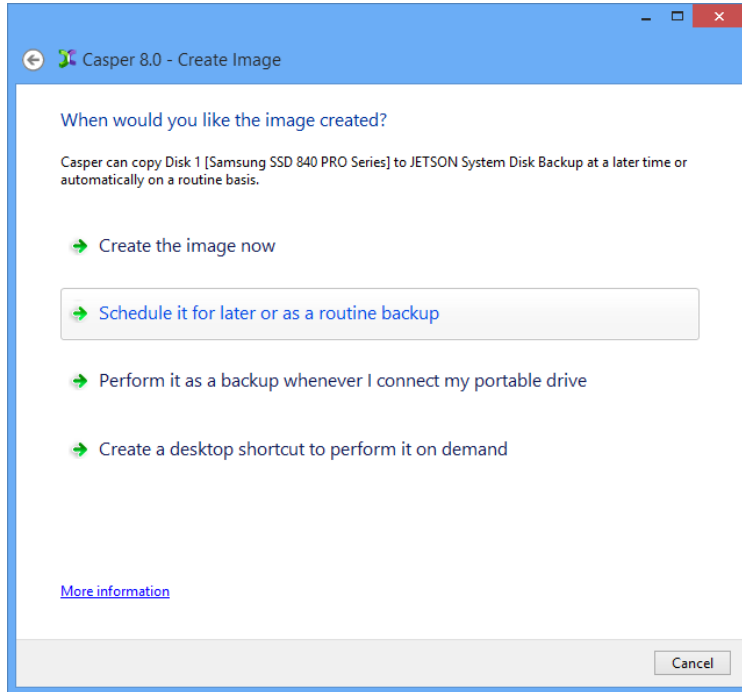


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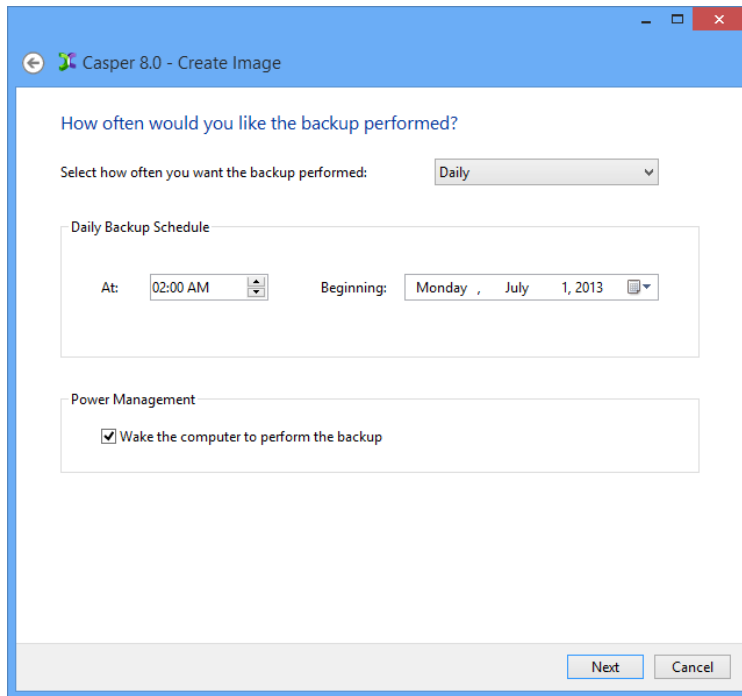
## Example 8: Automating a Restore-Point Backup

You can fully automate the process of creating and maintaining a restore-point backup for a server by scheduling Casper to run on a routine basis. The procedure outlined below is the same whether you are performing an initial backup as demonstrated in Example 6 or updating an existing backup as demonstrated in Example 7.

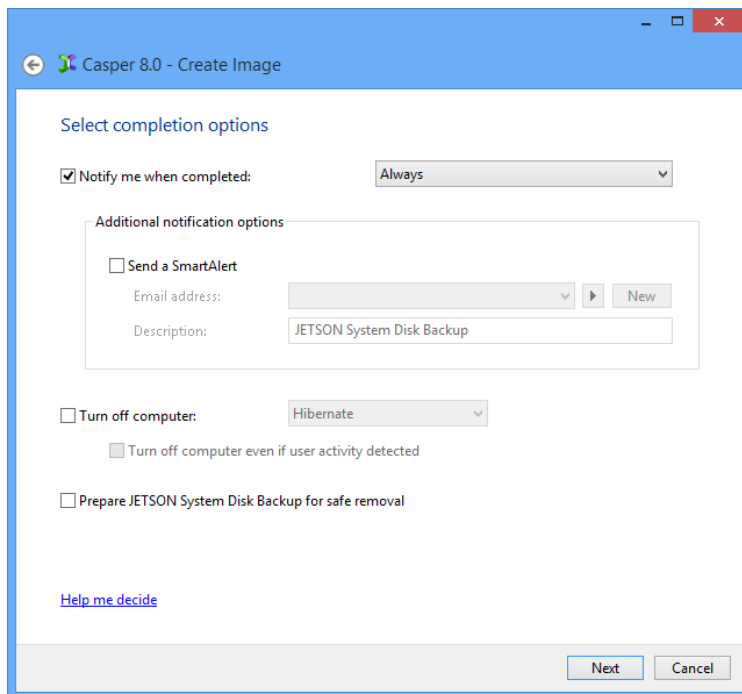
1. When prompted by the Create Image wizard, click **Schedule it for later or as a routine backup**.



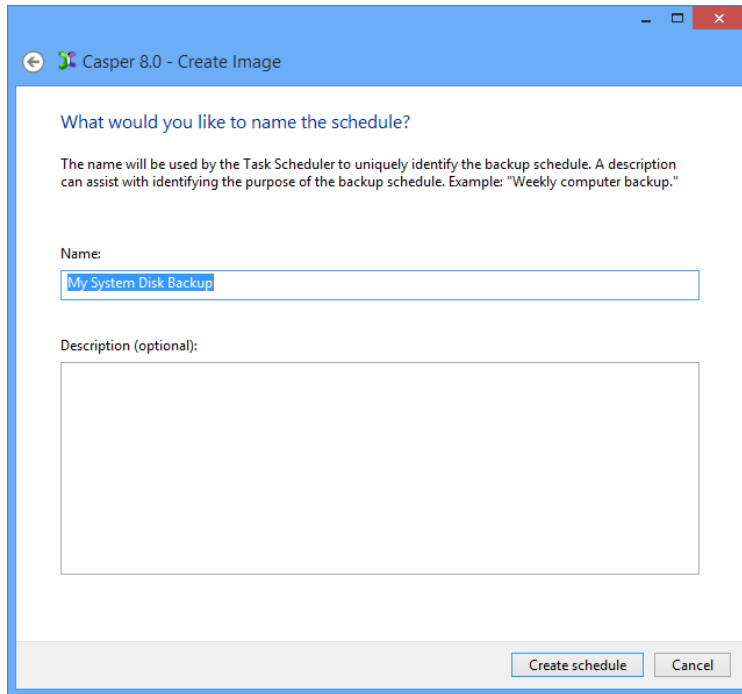
2. Select the schedule you would like Casper to follow to maintain the backup, and click **Next**. For help with the schedule, press **F1**.



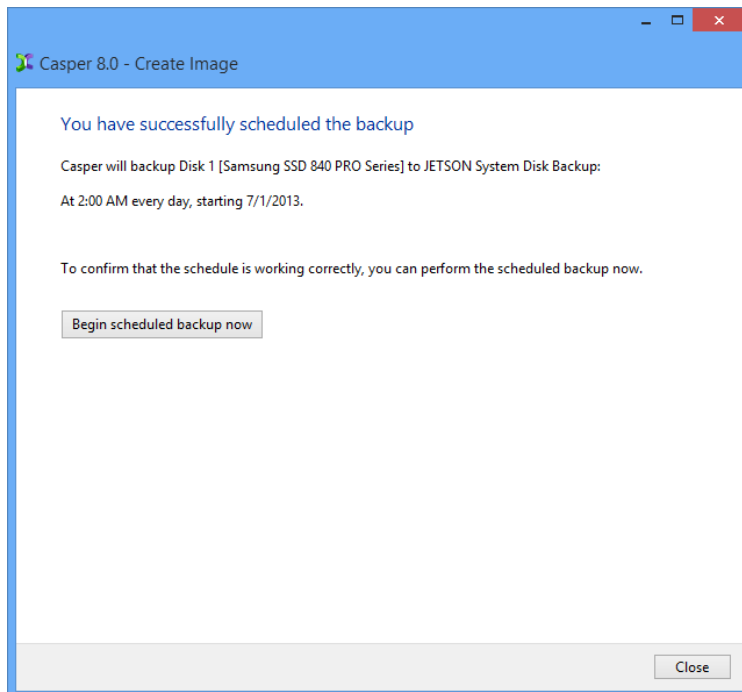
3. Select the desired completion options, and click **Next**.



4. Enter a name for the schedule, or retain the name suggested by Casper, and then click **Create schedule** to add the copy schedule to the server's Scheduled Tasks.



5. Click **Close** to return to the Casper console.



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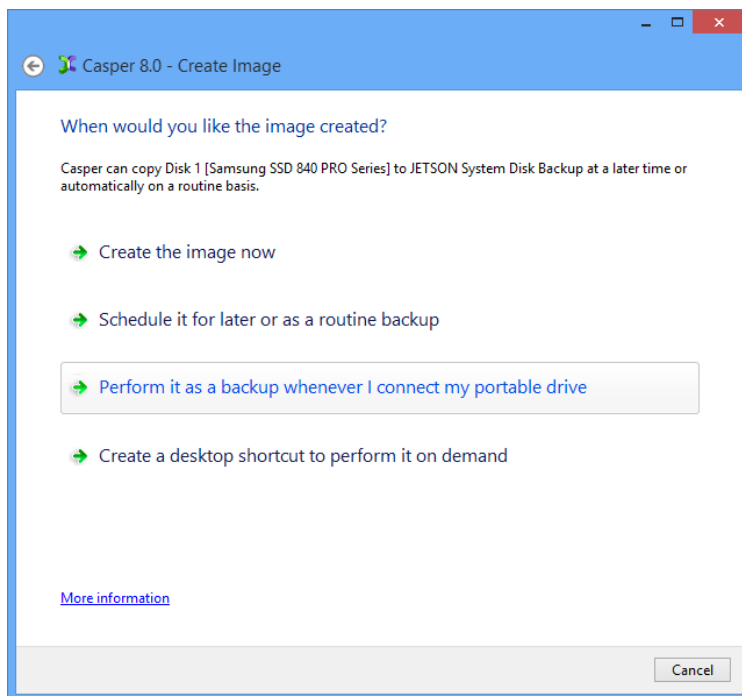
## Example 9: Automating a Restore-Point Backup to a Portable Device

When using a portable device such as an external USB, Firewire, or eSATA drive for the backup, you can configure Casper to automatically perform a backup whenever you attach the backup device.

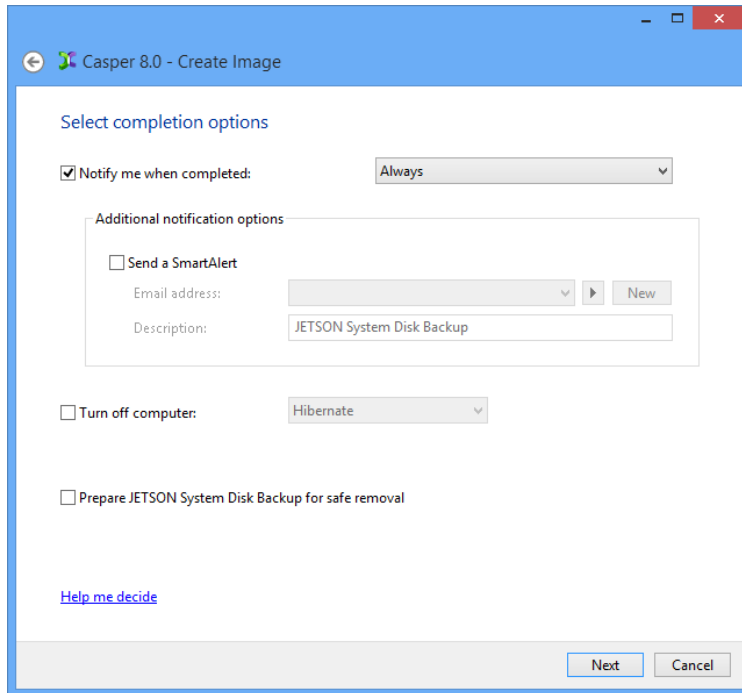
### Configuring a SmartSense Backup

The procedure outlined below is the same whether you are performing an initial backup as demonstrated in Example 6 or updating an existing backup as demonstrated in Example 7.

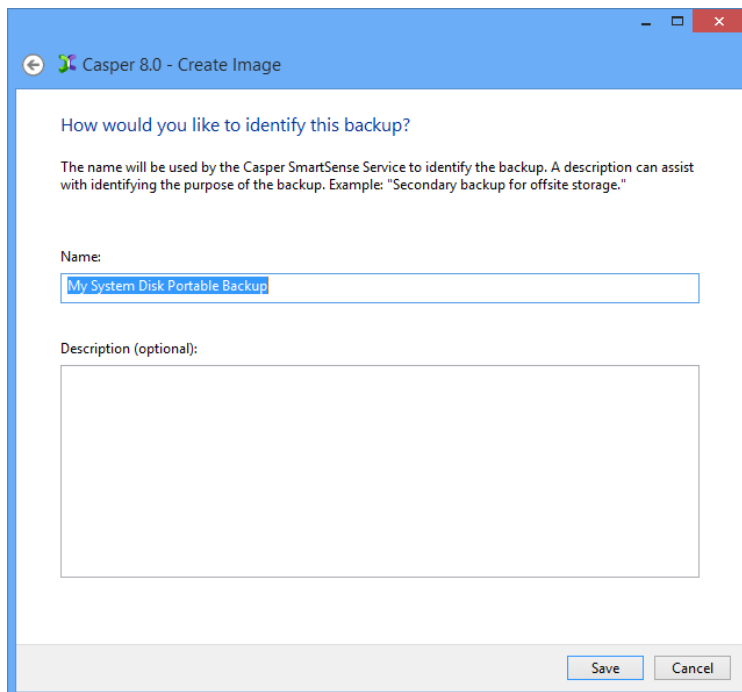
1. When prompted by the Create Image wizard, click **Perform it as a backup whenever I connect the portable drive**.



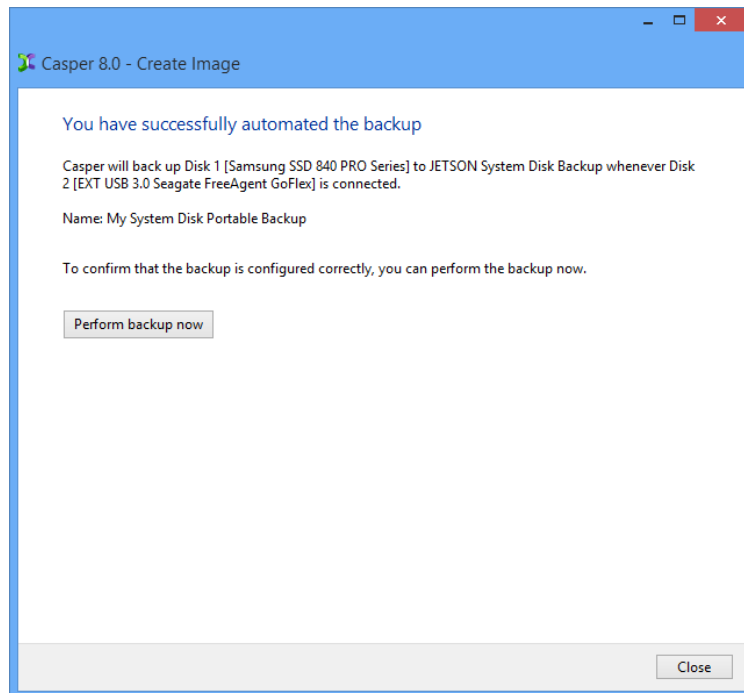
2. Select the desired completion options, and click **Next**.



3. Enter a name to uniquely identify the backup, or retain the name suggested by Casper, and then click **Save** to register the backup with the Casper SmartSense Service.

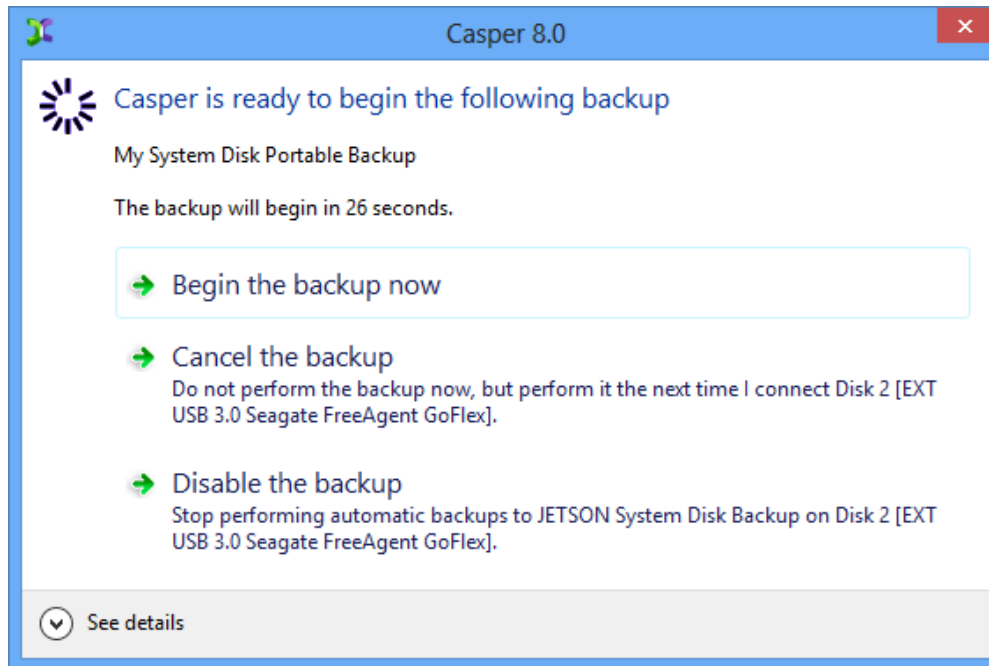


4. Click **Close** to return to the Casper console.



## Starting a SmartSense Backup

Once a portable backup drive has been registered with the Casper SmartSense Service, the backup can be started by simply attaching the portable drive to the server.



The backup will start automatically after a short delay. You can begin the backup immediately by selecting **Begin the backup now**. Click **Cancel the backup** to skip the backup, or **Disable the backup** to skip the current backup and prevent future backups from beginning automatically.

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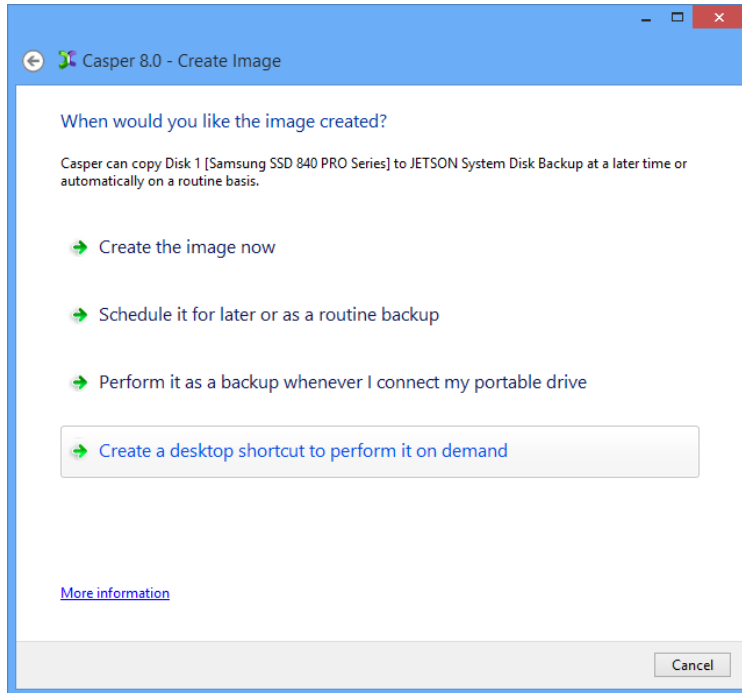
## Example 10: Performing a Restore-Point Backup On-Demand

You can create a desktop shortcut to perform a restore-point backup on-demand.

### Creating a Desktop Shortcut for a Restore-Point Backup

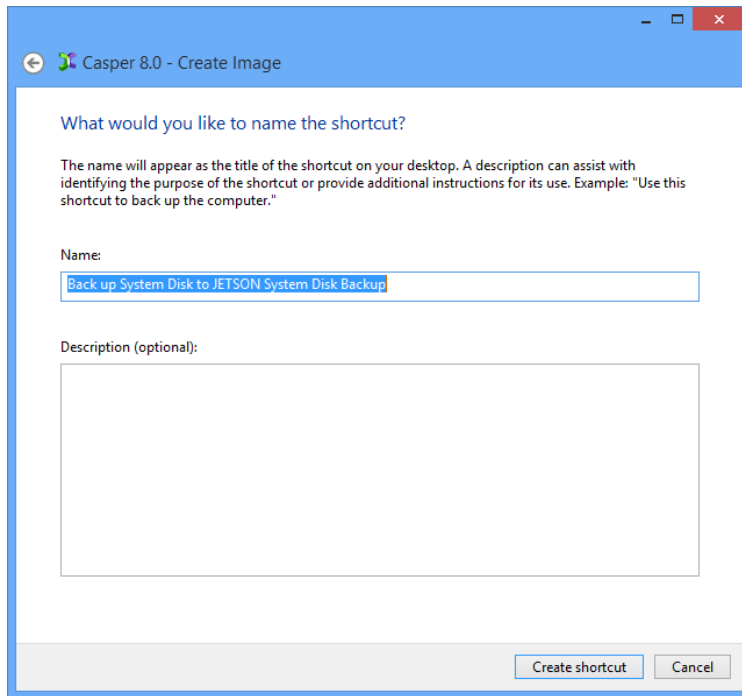
The procedure outlined below is the same whether you are performing an initial backup as demonstrated in Example 6 or updating an existing backup as demonstrated in Example 7.

1. When prompted by the Create Image wizard, click **Create a desktop shortcut to perform it on demand**.

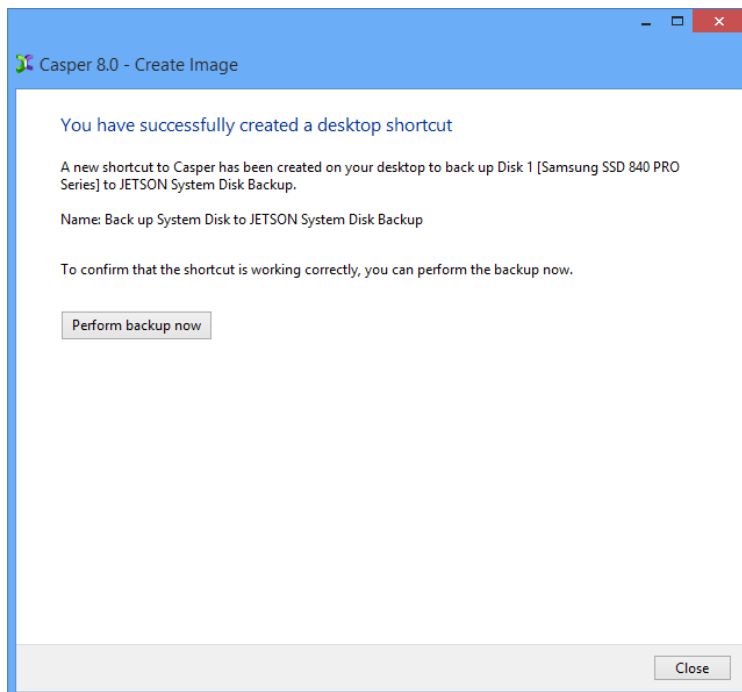




2. Enter a name for the shortcut, or retain the name suggested by Casper, and click **Create shortcut**.

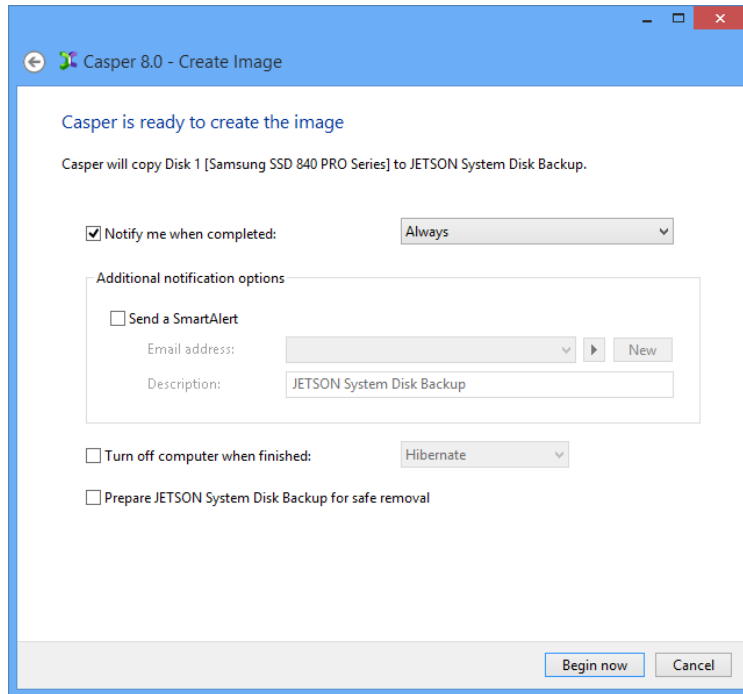


3. Click **Close** to return to the Casper console.



## Performing a Restore-Point Backup On-Demand

After creating a desktop shortcut, you can use the Casper shortcut appearing on your desktop to begin the backup. Click **Begin now** to start the backup.



# Recovering from a System Disk Failure

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If you have used Casper to create a backup of the server's Windows system disk device, and the device fails or its contents become corrupted, you can restore the server to working order by using the Casper backup.

If you created a bootable backup, you can run the server directly from the backup either by replacing the server's existing Windows system disk device with the backup device or by temporarily reconfiguring the server to boot and run directly from the backup device. For details, please see **Booting from a System Backup Hard Disk**.

If you are unable to boot the server to the bootable backup, or if you created a restore-point backup, you must boot the server to the Casper Startup and Recovery Environment and restore the backup. Restoration may be made to either the existing Windows system disk device or a replacement disk device (e.g., when the existing disk device is no longer operable). For details, please see **Restoring a System Backup**.

If you created a restore-point backup and added the Casper Startup and Recovery Environment to the backup device, you can boot the server directly from the backup device to perform the restore. When restoring a bootable backup, or when the Casper Startup and Recovery Environment has not been added to the backup device, the Casper Startup Disk can be used to boot the server to perform the restore. For details on creating and using a Casper Startup Disk, please see the **Casper Startup Disk Creator Guide**.

The following table summarizes the available system recovery options for each type of backup.

## System Recovery Options

Casper Bootable Backup	Casper Restore-Point Backup
Permanently replace existing system disk device with backup disk device.	If Casper Startup and Recovery Environment was added to backup device, boot computer to backup device and restore backup.
Temporarily configure server to boot and run from backup disk device and restore backup.	Boot computer to Casper Startup Disk and restore backup from backup device.
Boot server to Casper Startup Disk and restore backup from backup device.	

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## Booting from a System Backup Hard Disk

If you have used Casper to create a bootable backup of the server's system disk device, and this disk device fails or its contents become corrupted, you can boot the computer from the backup disk device.

If you have used Casper to create a bootable backup of the server's system disk device, you can run the server directly from the backup either by replacing the server's existing system disk device with the backup device or by temporarily reconfiguring the server to boot and run directly from the backup device. Either way, the backup device will take on the identity of the server's original system disk device. For example, if the server's system disk normally boots and appears as Local Disk (C:), the backup device will boot and appear as Local Disk (C:) whenever the server has been configured to boot and run from it. In addition, all programs, settings, and data will run and appear just they did on the original system disk device when the backup was created.

When the backup disk device is installed as an internal hard disk or secondary RAID array, or when it is attached externally as an eSATA or USB device, booting from the backup disk device is accomplished by changing the boot priority setting in the server's BIOS or EFI Firmware to designate the backup disk device as the preferred boot device.

If the server's BIOS or EFI Firmware does not offer an option to select the designated backup disk device as the preferred boot device, or if the original disk device fails completely, the backup disk device must be reconfigured to replace the original disk device.

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**NOTE:** For a hard disk attached as an external USB device, booting from the backup hard disk may require the selection of additional BIOS or EFI Firmware options to completely enable booting. By default, some BIOS implementations disable USB boot support, or have it configured for floppy or ZIP drive emulation rather than hard disk drive (HDD) emulation. *If the computer's BIOS or EFI Firmware does not support booting from external USB hard disk type devices, a bootable backup hard disk must be removed from its external enclosure and installed as a replacement for the internal system disk device in order to boot from it.* Alternatively, a restore may be performed by using the Casper Startup Disk to copy the external backup hard disk to the computer's internal system disk device.

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## Restoring a System Backup

If you created a restore-point backup, or if you are unable to boot the server to the bootable backup, a system backup can be restored by booting the server to the Casper Startup and Recovery Environment.

If the Casper Startup and Recovery Environment was added to the backup device, you can boot the server directly from the backup device to perform the restore. When restoring a bootable backup, or when the Casper Startup and Recovery Environment is not present on the backup device, the Casper Startup Disk can be used to boot the server to perform the restore.

Booting a server from the Casper Startup and Recovery Environment may take several minutes. Once it has completed the boot process, Casper SmartRestore™ will attempt to automatically identify the backup and prompt you to begin the restore. If SmartRestore is unable to locate the backup, the Casper console will display. For more information on using Casper SmartRestore to perform a restore, please see the **Casper SmartRestore Guide**.

The following examples illustrate how to manually restore a system backup when Casper SmartRestore is unable to locate the backup.

**Example 11: Manually Restoring a Restore-Point Backup.** This example shows how to manually restore a backup using the **Restore Image** wizard.

**Example 12: Manually Restoring a Bootable Backup.** This example demonstrates how to manually restore a bootable backup using the **Copy Drive** wizard.

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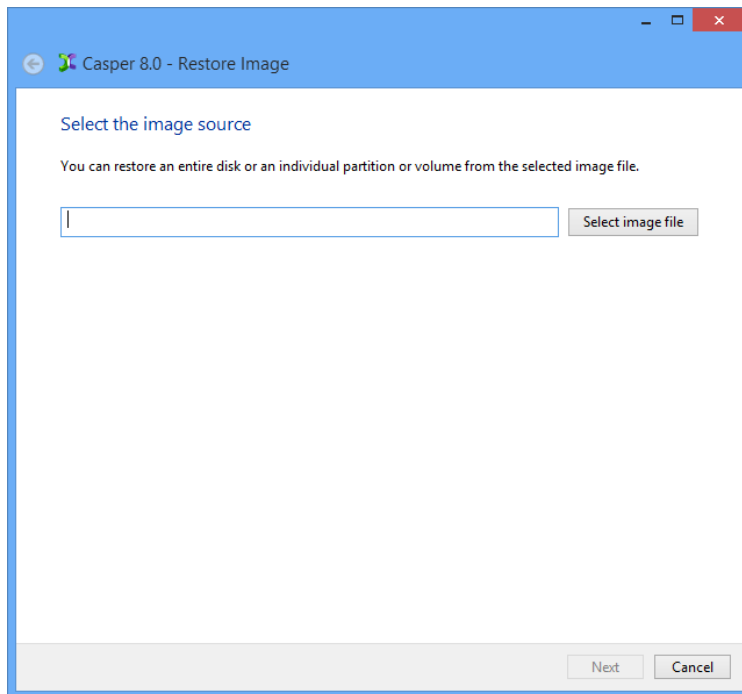
## Example 11: Manually Restoring a Restore-Point Backup

Assuming the server is presently booted to the Casper Startup and Recovery Environment and SmartRestore was unable to locate the backup, the following procedure illustrates how to manually restore an image of the server's system disk device to either the original system disk device or a replacement disk device.

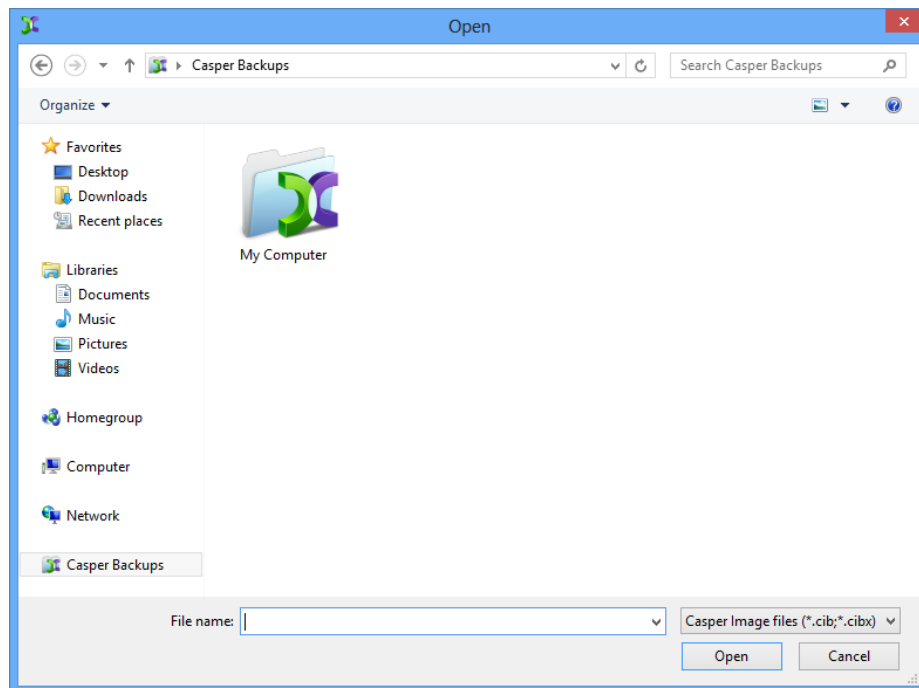
1. Select **Restore Image**.



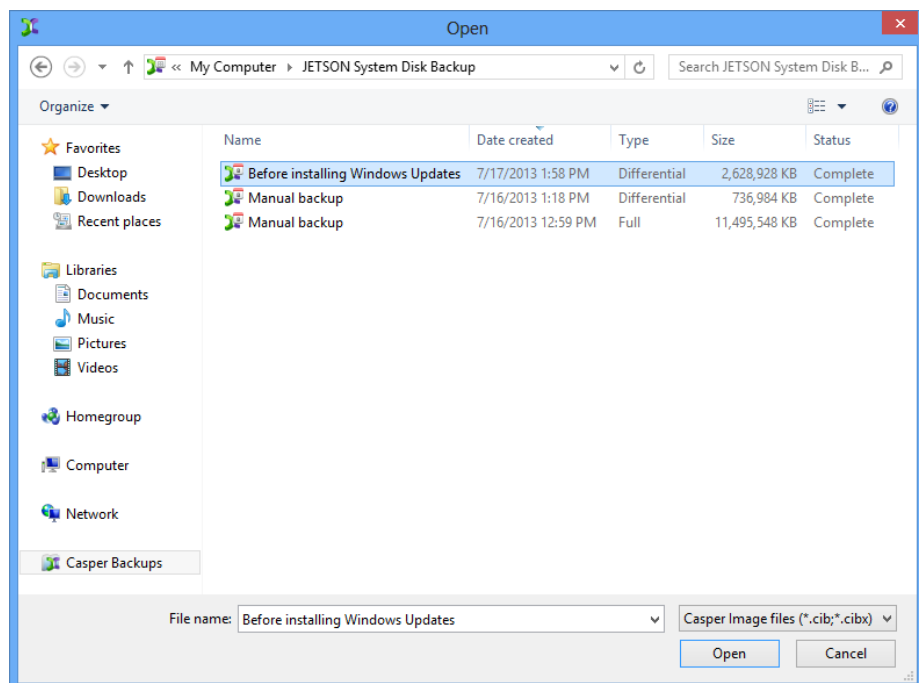
2. Click **Select image file**.



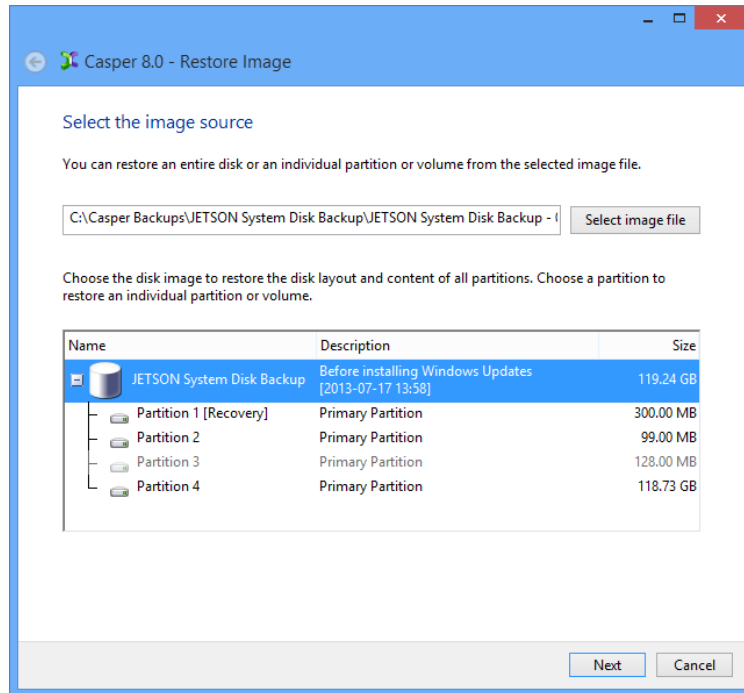
3. In the Open dialog, navigate to the folder that contains the backup you want to restore. By default, the **Casper Backups** folder will be selected. This special folder provides direct access to all of the restore-point backups that were discovered. Double-click the **My Computer** folder to see all of the restore-point system backups that were located for the server.



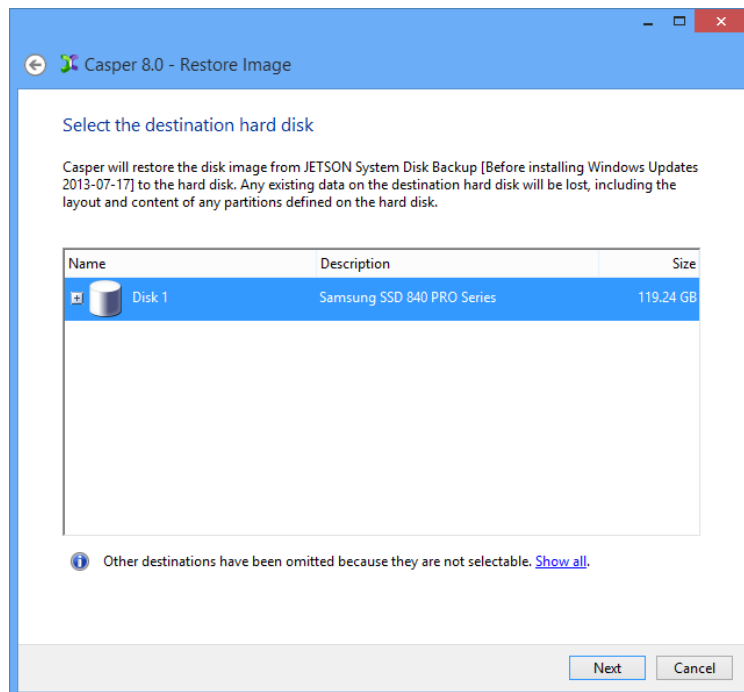
4. Select the image you want to restore and click **Open**.



5. Once the selected image has loaded, click **Next**.

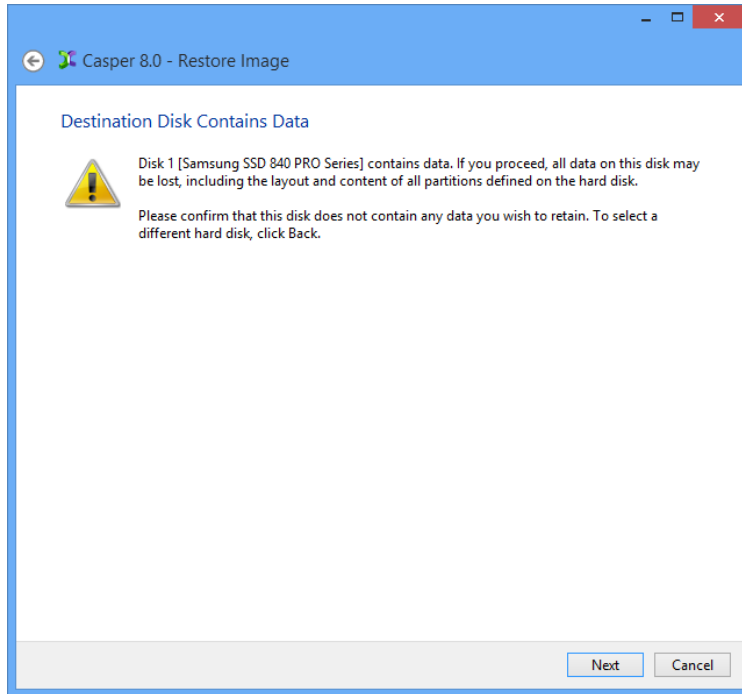


6. Select the disk device that will become the restored Windows system disk as the destination, and then click **Next**.

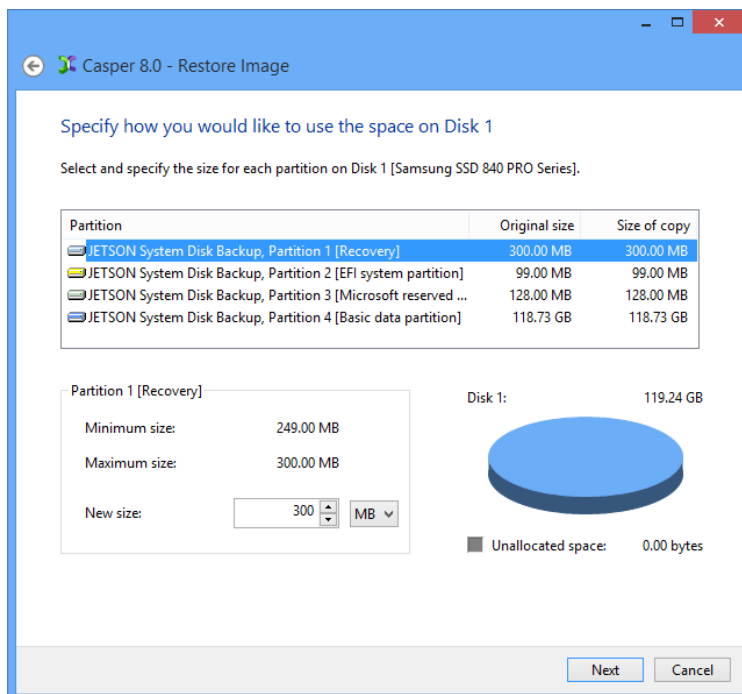




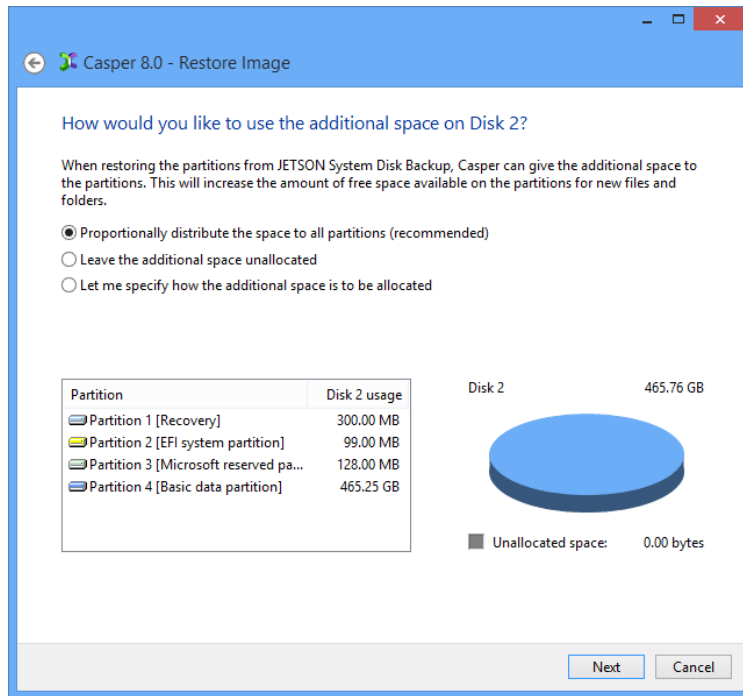
7. If the selected destination device defines a partition or contains data, Casper will warn you that the contents will be overwritten. Confirm you have selected the correct disk device to receive the restored image, and click **Next** to proceed.



8. When prompted to specify how the space on the destination device is to be used, retain the default selection and click **Next**. If the destination is the same size or smaller than the original, Casper will ask you to manually configure how the space is to be used.

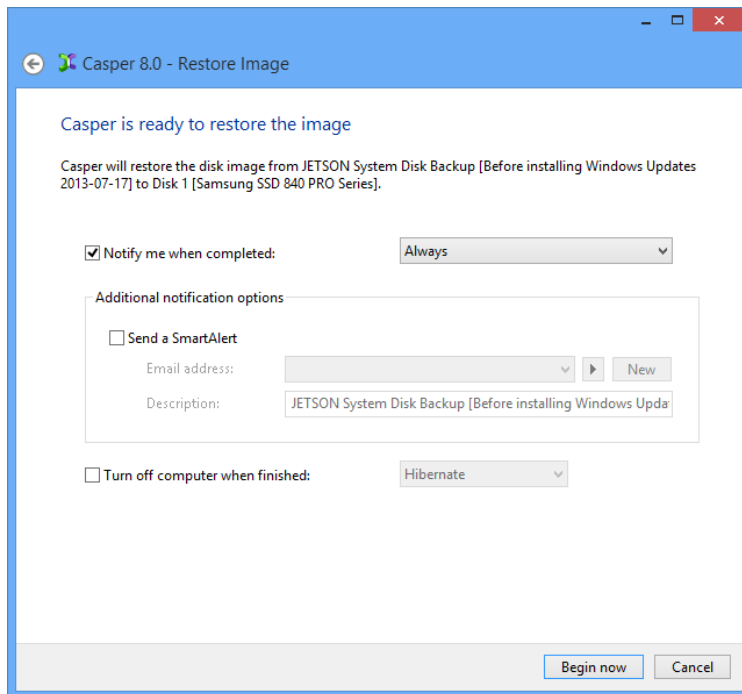


If restoring the image to a disk device that is larger than the original, the default option will be *Give all of the space to the partition*, or *Proportionally distribute the space to all partitions* when there is more than one partition defined in the image.

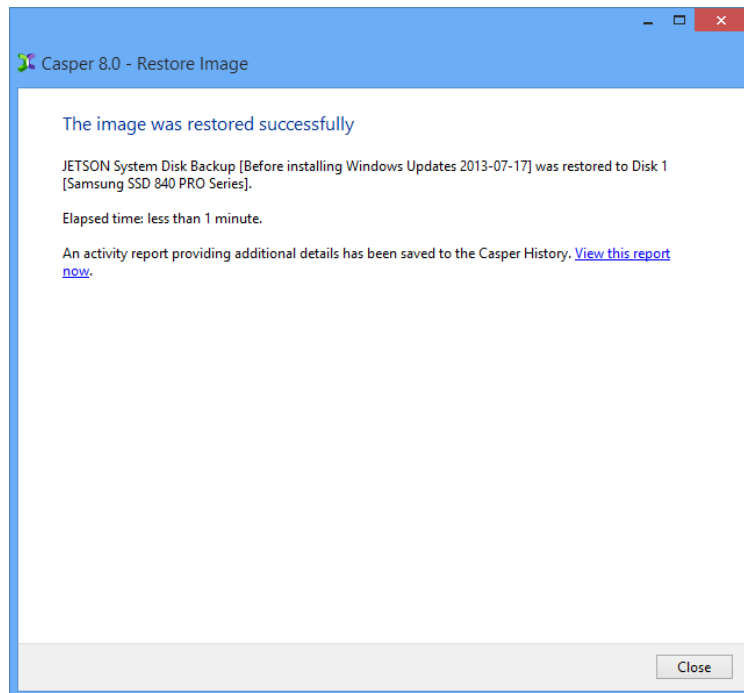


Simply clicking **Next** to accept the default selection or value is generally best.

9. Click **Begin now** to begin the image restoration process.



10. When Casper has completed the restoration process, click **Close**.



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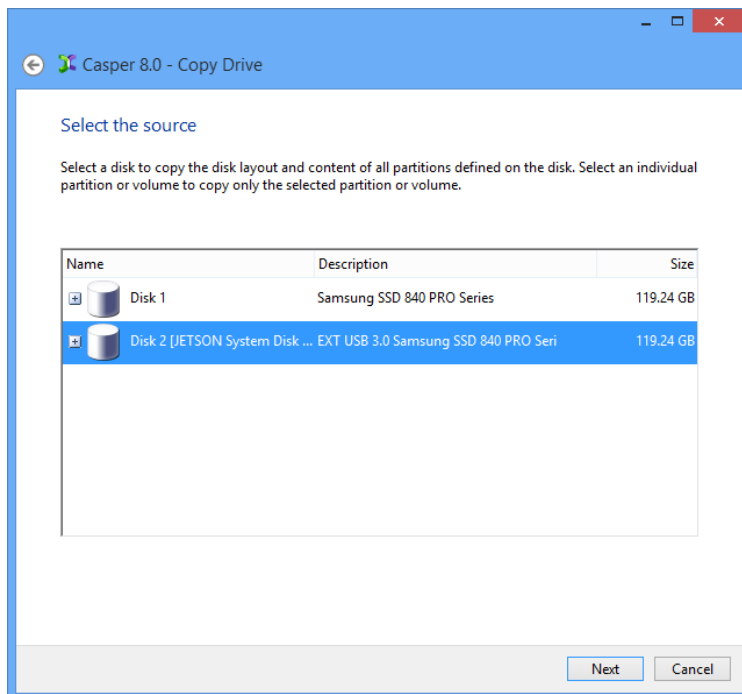
## Example 12: Manually Restoring a Bootable Backup

Assuming the server is presently booted to the Casper Startup and Recovery Environment and SmartRestore was unable to locate the backup, the following procedure illustrates how to manually restore a bootable backup of the server's system disk device to either the original system disk device or a replacement disk device.

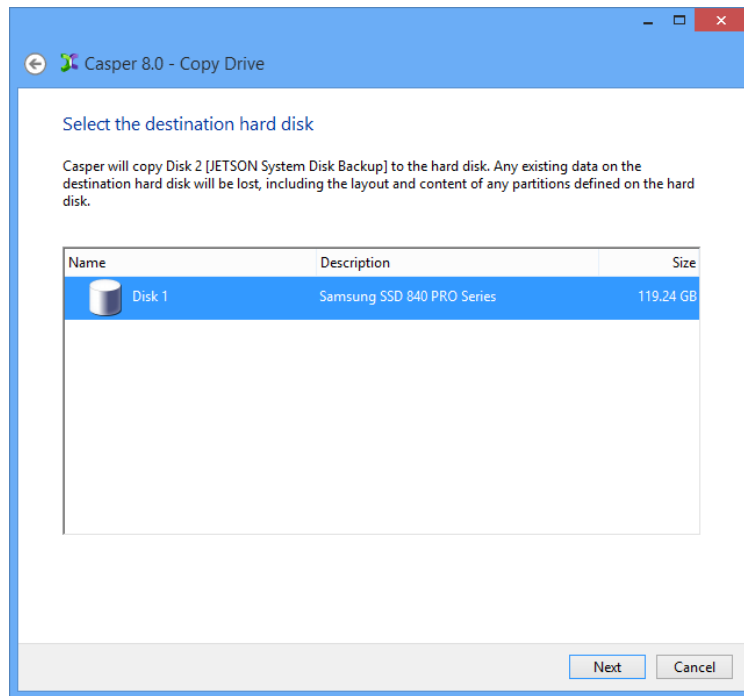
1. Select **Copy Drive**.



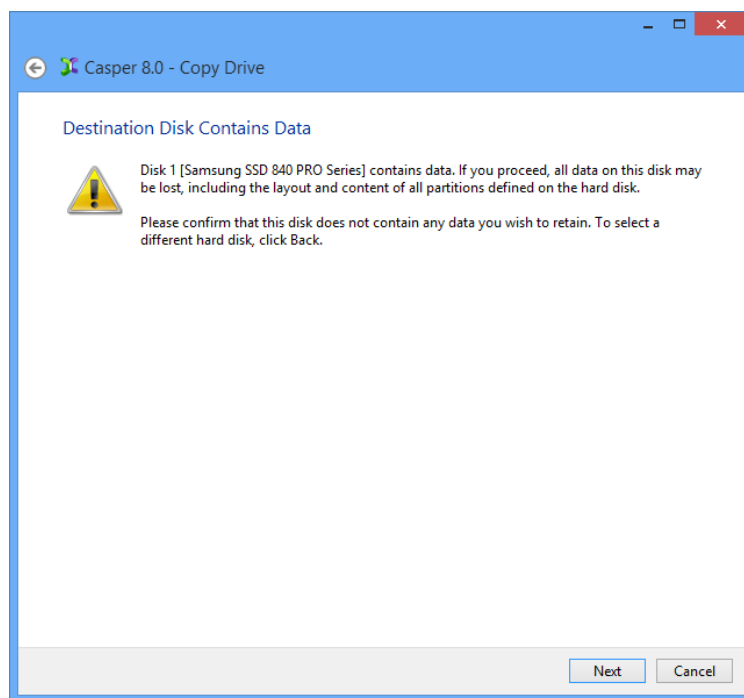
2. Select the disk device containing the bootable backup to restore as the source, and click **Next**.



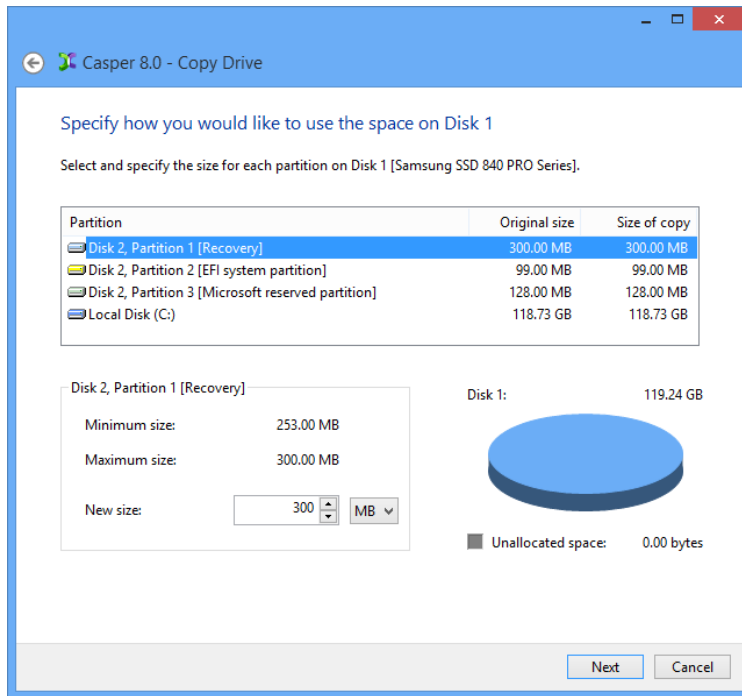
3. Select the disk device that will become the restored Windows system disk as the destination, and then click **Next**.



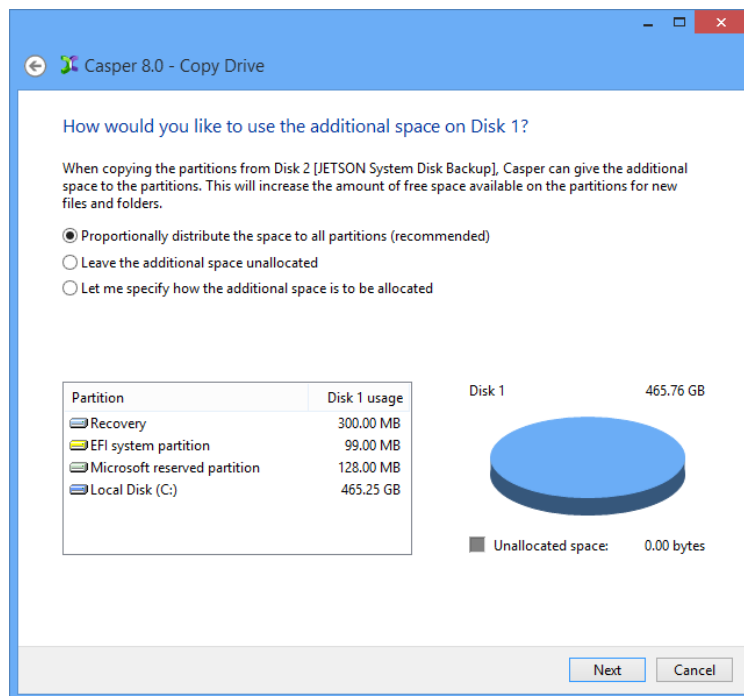
4. If the selected destination device defines a partition or contains data, Casper will warn you that the contents will be overwritten. Confirm you have selected the correct disk device to receive the restored backup, and click **Next** to proceed.



- When prompted to specify how the space on the destination device is to be used, retain the default selection and click **Next**. If the destination is the same size or smaller than the backup source, Casper will ask you to manually configure how the space is to be used.

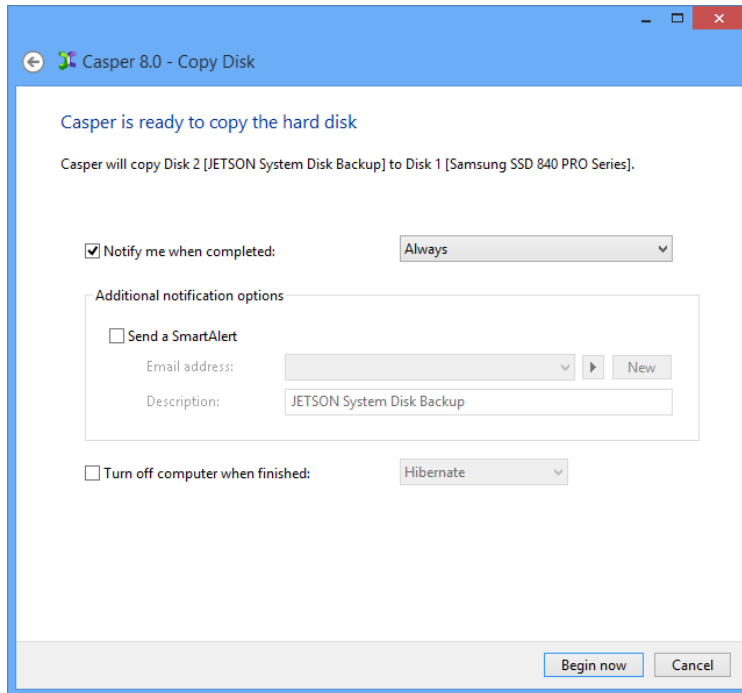


When the destination is larger than the backup source, the default option will be *Give all of the space to the partition*, or *Proportionally distribute the space to all partitions* when there is more than one partition defined on the backup source.

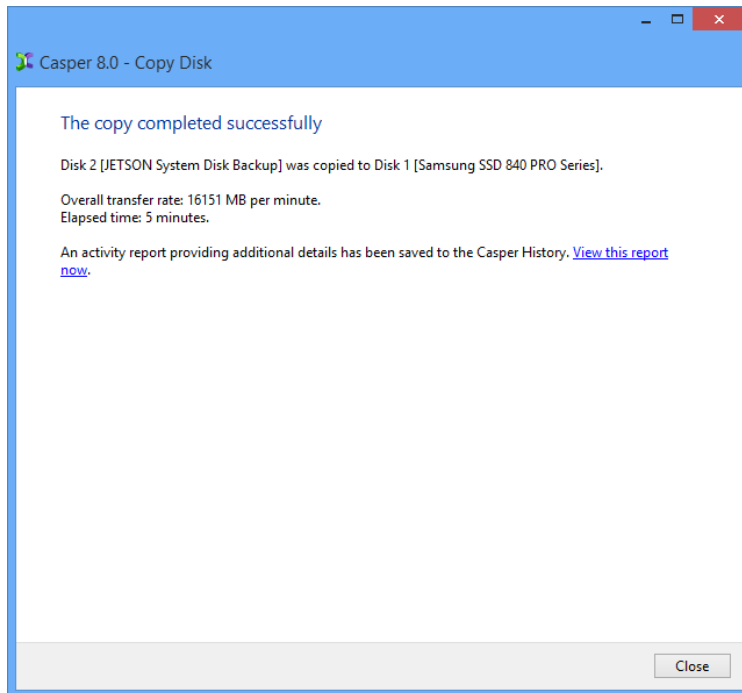


Simply clicking **Next** to accept the default selection or value is generally best.

6. Click **Begin now** to begin the cloning process.



7. When Casper has completed the cloning process, click **Close**.



## Retrieving Specific Files and Folders from a Backup

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You can retrieve a specific file or folder from a backup without booting to the backup or performing a restore. Because a bootable backup is a clone of the server's system disk device, it can be accessed in the same manner as the system disk device whenever it is connected to the server. Similarly, the contents of a restore-point backup can be accessed in the same manner as the server's system disk device whenever it has been mounted.

The following examples illustrate how to access the contents of a backup to retrieve specific files and folders without booting or restoring the entire backup.

**Example 13: Accessing the Contents of a Bootable Backup.** This example shows how to browse a bootable backup using Windows File Explorer to retrieve a file located in the [My] *Documents* folder.

**Example 14: Accessing the Contents of a Restore-Point Backup.** This example demonstrates how to use Windows File Explorer to mount a specific restore-point within a restore-point backup and retrieve a file from the *Documents* folder of the backup.

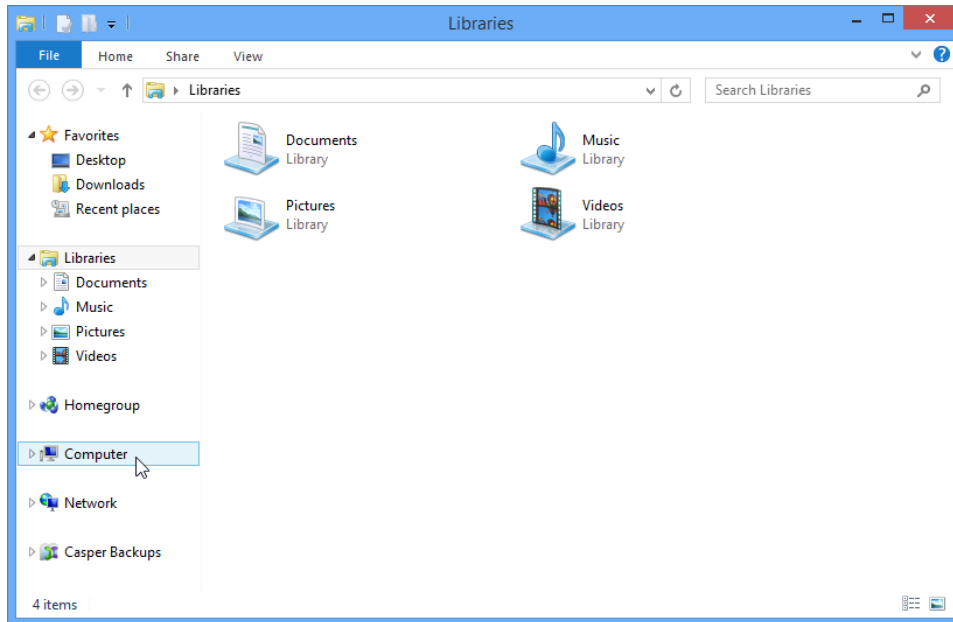


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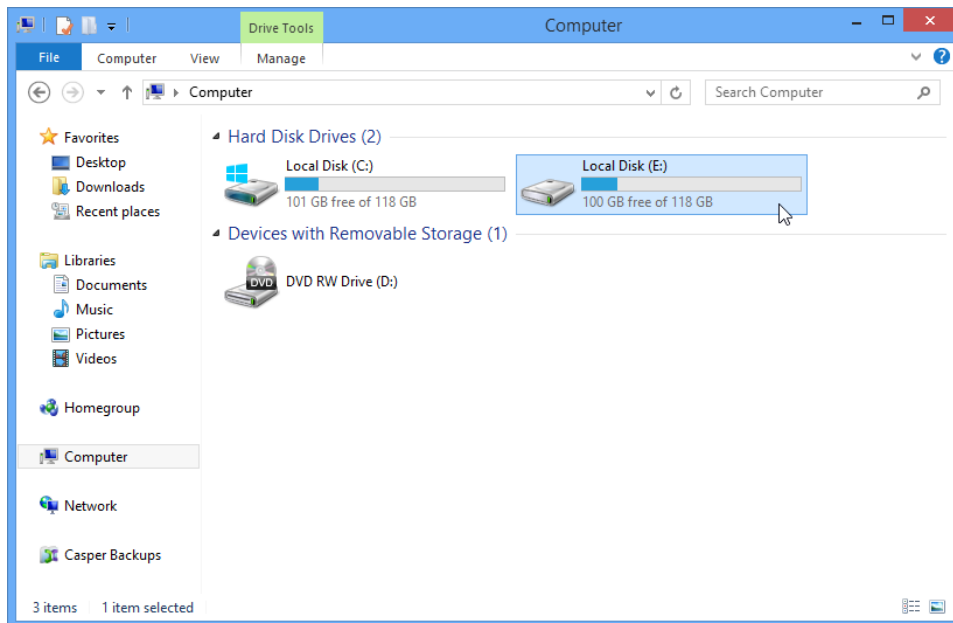
## Example 13: Accessing the Contents of a Bootable Backup

Assuming the disk device containing the bootable backup is currently installed or attached to the server, the following procedure illustrates how to browse the contents of the backup to retrieve a specific file from the [My] *Documents* folder.

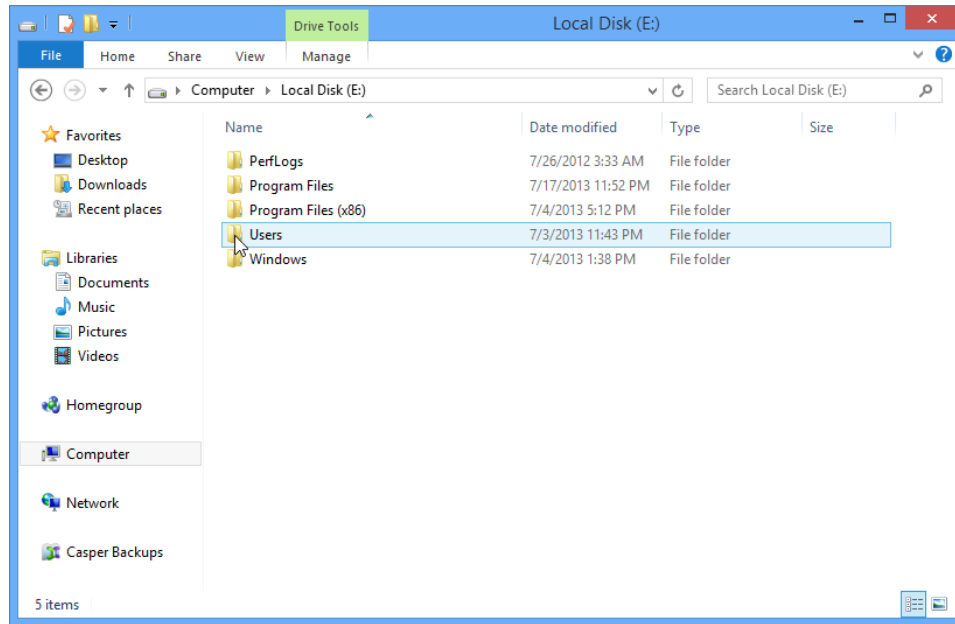
1. Open **This PC** or [**My**] **Computer**. On Windows Server 2012, start **Windows File Explorer** and then click **This PC**. On Windows Server 2008 and earlier, simply click [**My**] **Computer** on the *Start* menu.



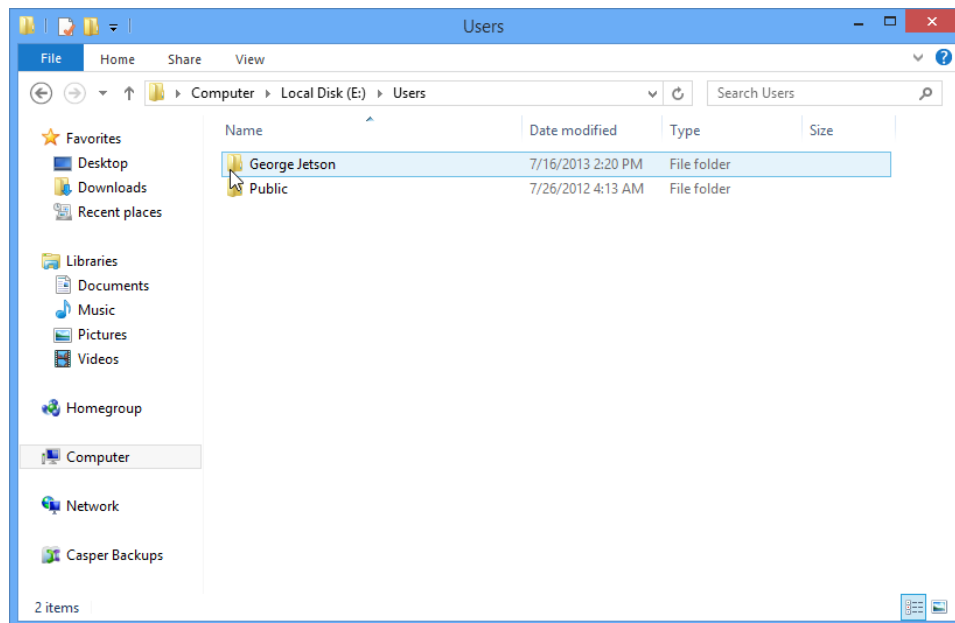
2. Double-click the drive containing your bootable backup. In this example, **Local Disk (E:)** represents the drive letter assigned by Windows to the backup drive.



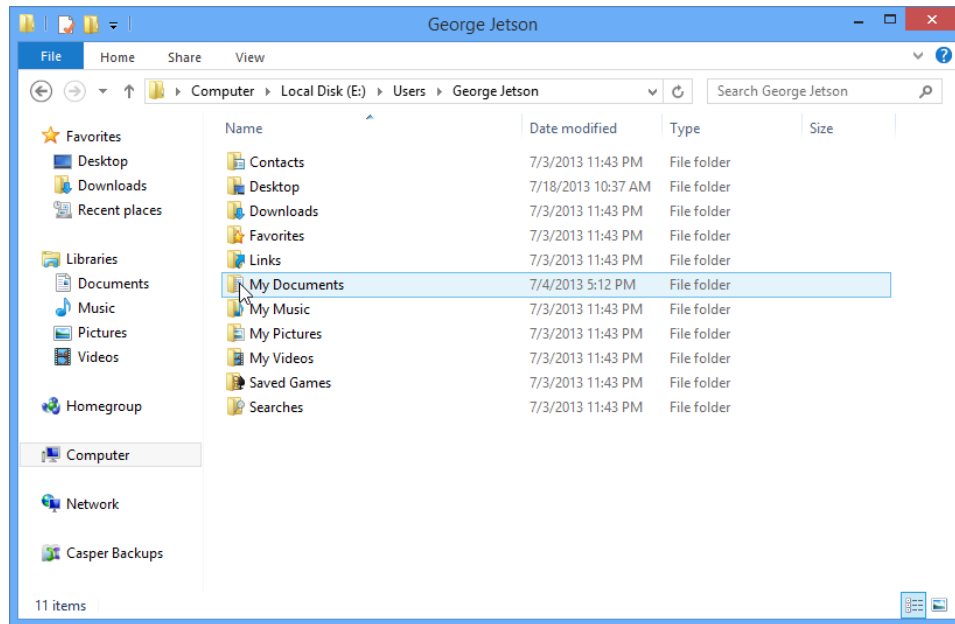
3. Double-click **Users** to open the Users folder.



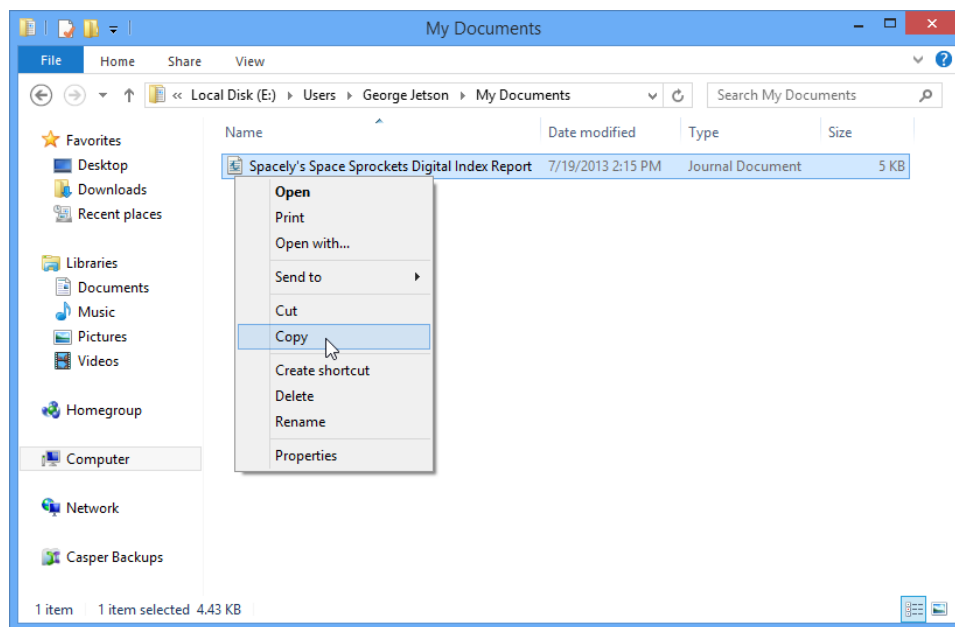
4. Double-click the folder that corresponds to the account name with which you normally log onto the computer. In this example, the user logs on as **George Jetson**.



5. Double-click the **[My] Documents** folder to access the contents of the *Documents* folder. The contents of this folder will represent the original contents of the *Documents* folder appearing on the system drive when the backup was created.



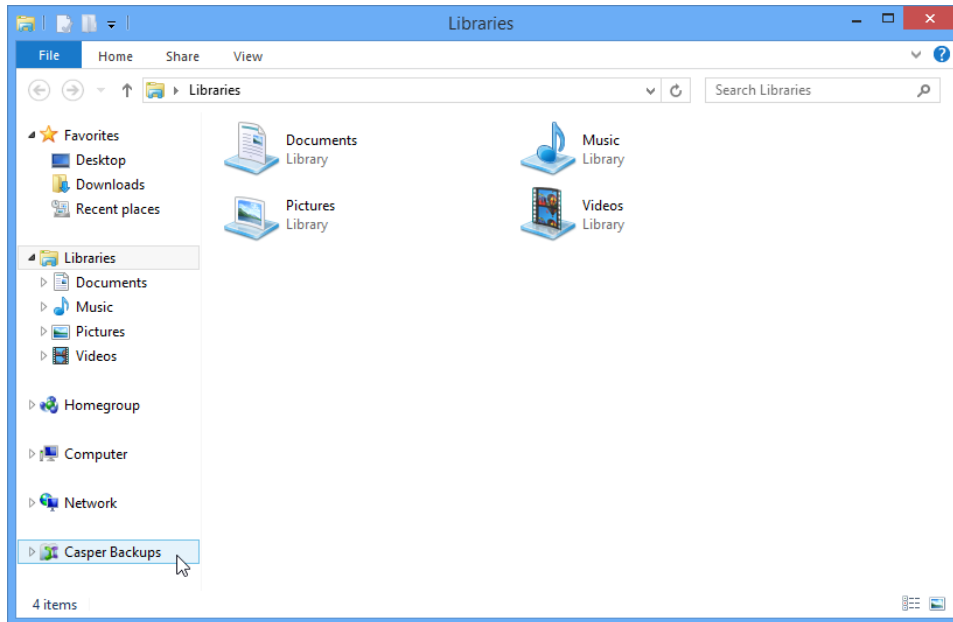
6. Once you have located the desired file or folder, you can access or copy it as you would any other file on the original drive.



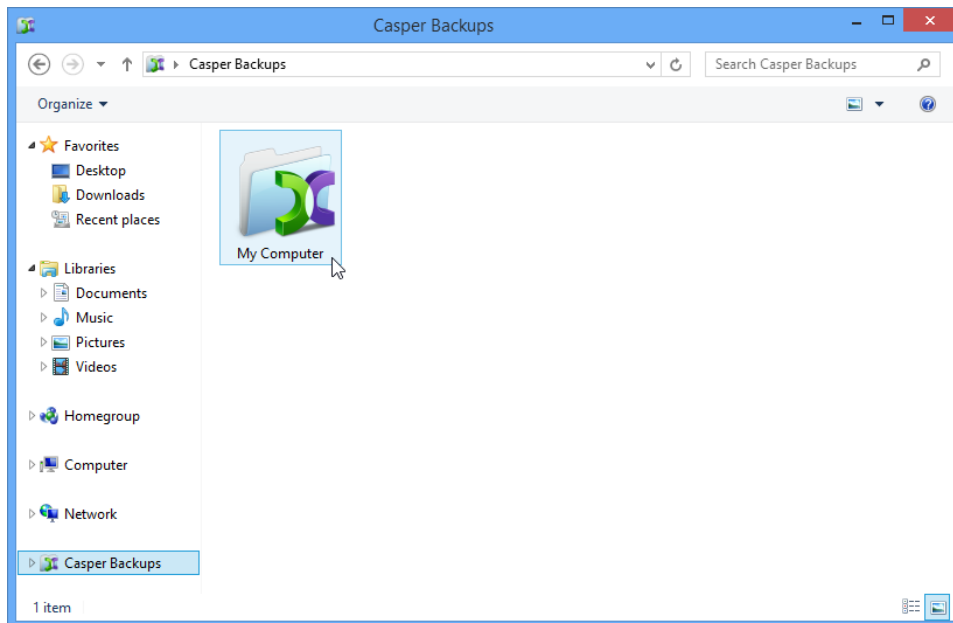
## Example 14: Accessing the Contents of a Restore-Point Backup

Assuming the backup device containing the restore-point backup is currently installed or attached to the server, the following procedure illustrates how to mount a restore-point backup and retrieve a specific file from the *Documents* folder.

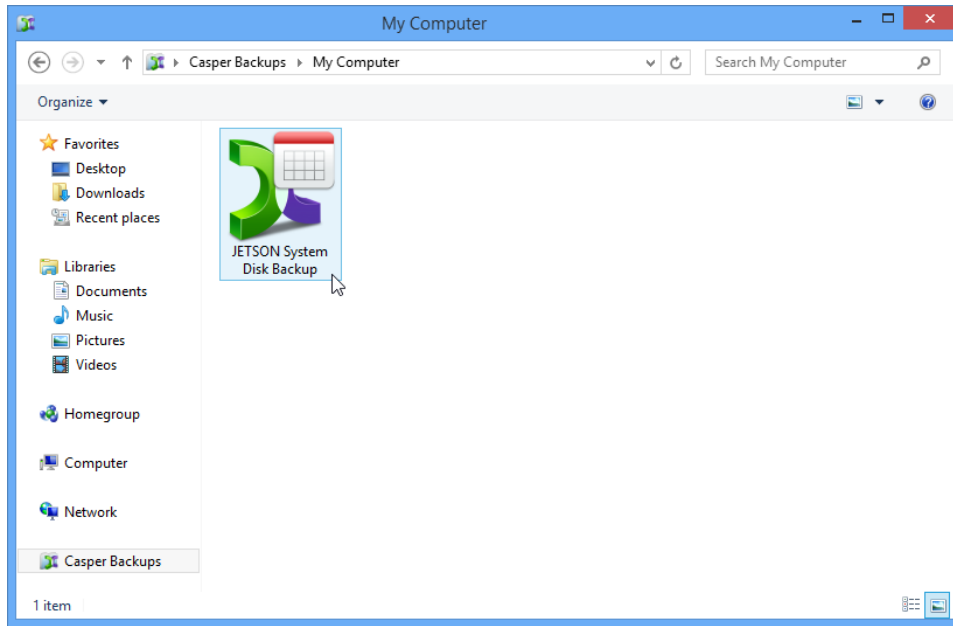
1. Open the **Casper Backups** folder. On Windows Server 2012, start **Windows File Explorer** and then click **Casper Backups**. On Windows Server 2008 and earlier, open **Windows Explorer** and click **Casper Backups**.



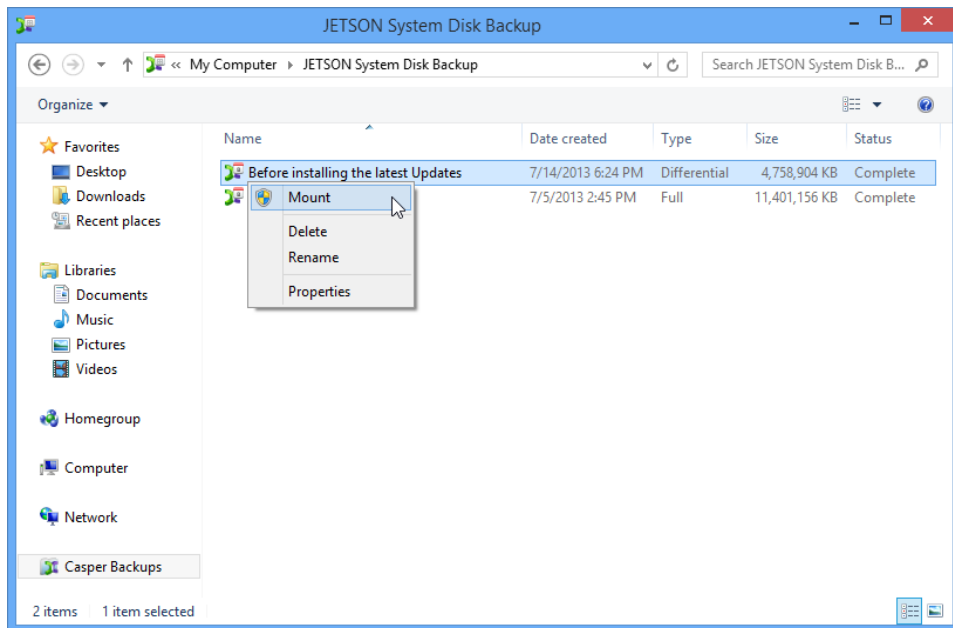
2. Double-click the **My Computer** folder to browse all of the restore-point backups discovered for the server.



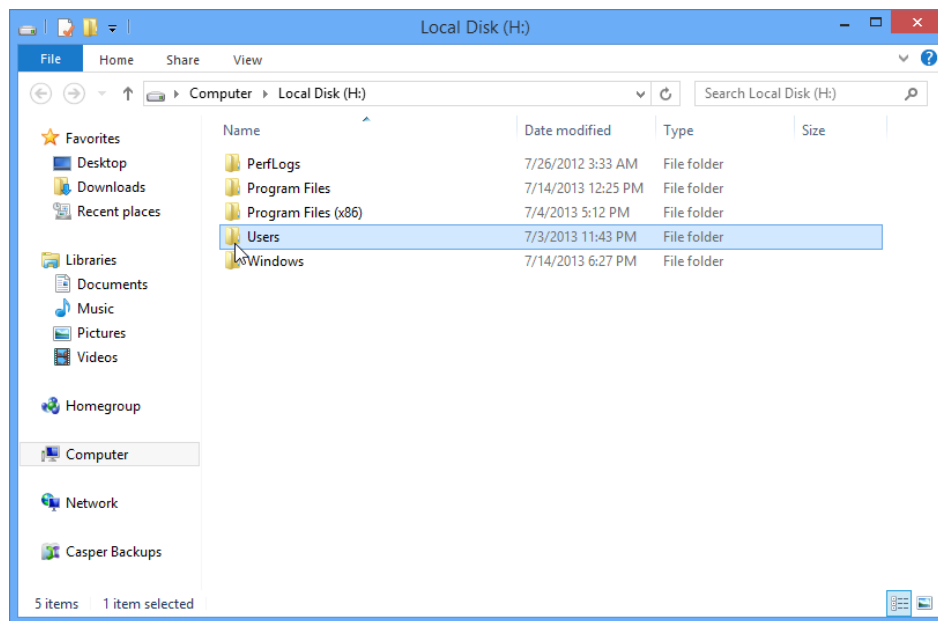
3. Double-click the backup containing the restore-point you want to access.



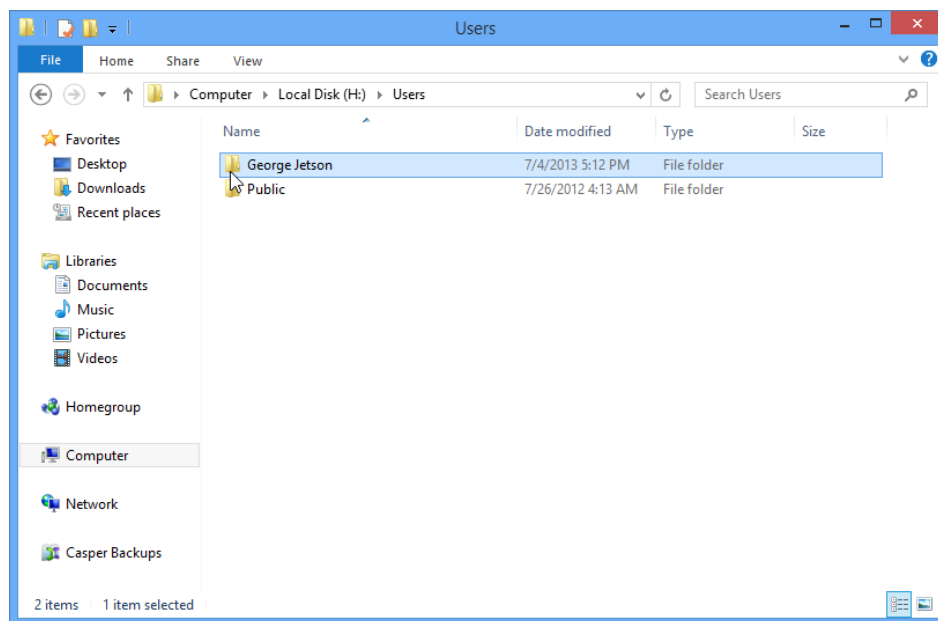
4. Right-click on the desired restore-point, and then click **Mount**.



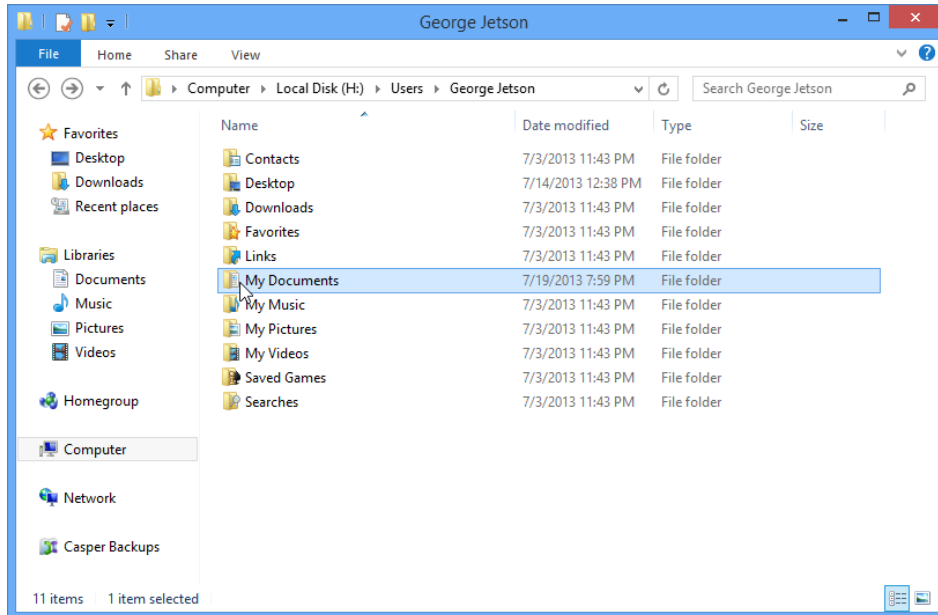
5. After the restore-point has been mounted and a drive letter has been assigned, a new Explorer window will open to reveal its contents. In this example, **Local Disk (H:)** was assigned to the restore-point when it was mounted. Double-click **Users** to open the Users folder.



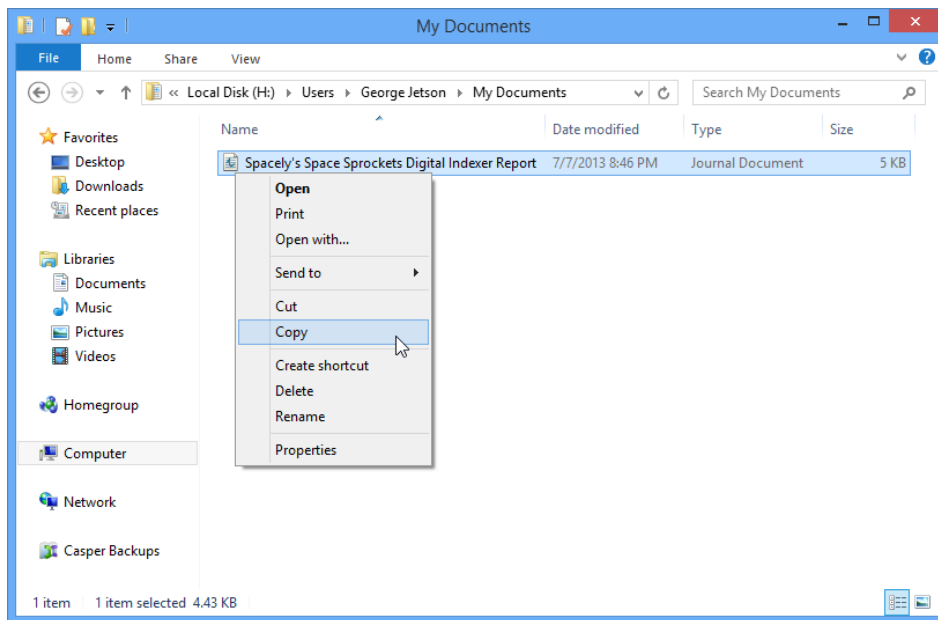
6. Double-click the folder that corresponds to the account name with which you normally log onto the computer. In this example, the user logs on as **George Jetson**.



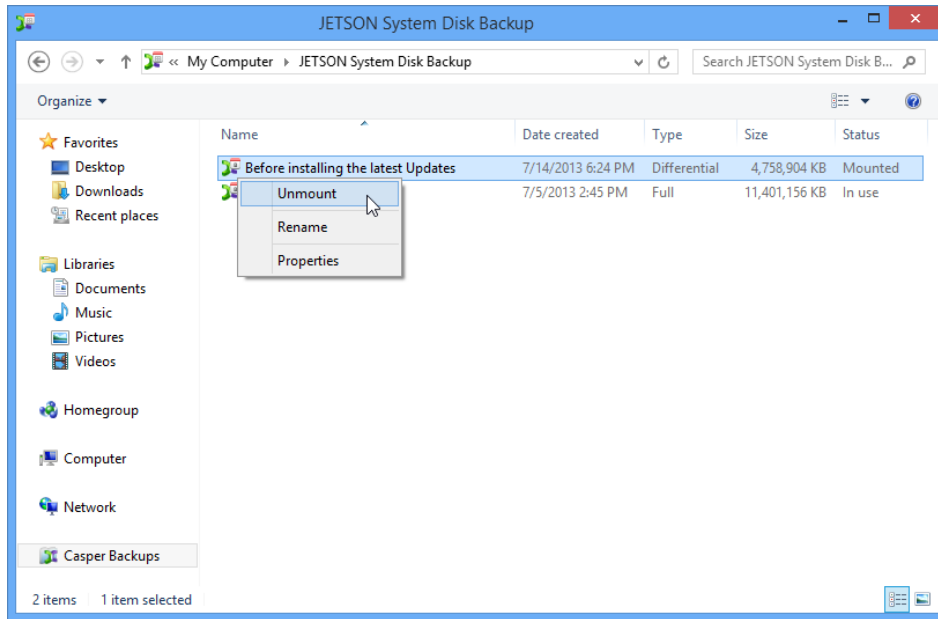
7. Double-click the **[My] Documents** folder to access the contents of the *Documents* folder. The contents of this folder will represent the original contents of the *Documents* folder appearing on the system drive when the backup was created.



8. Once you have located the desired file or folder, you can access or copy it as you would any other file on the original drive.



9. When you have finished accessing the contents of the restore-point, right-click on the restore-point and select **Unmount**.





## Upgrading a Hard Disk

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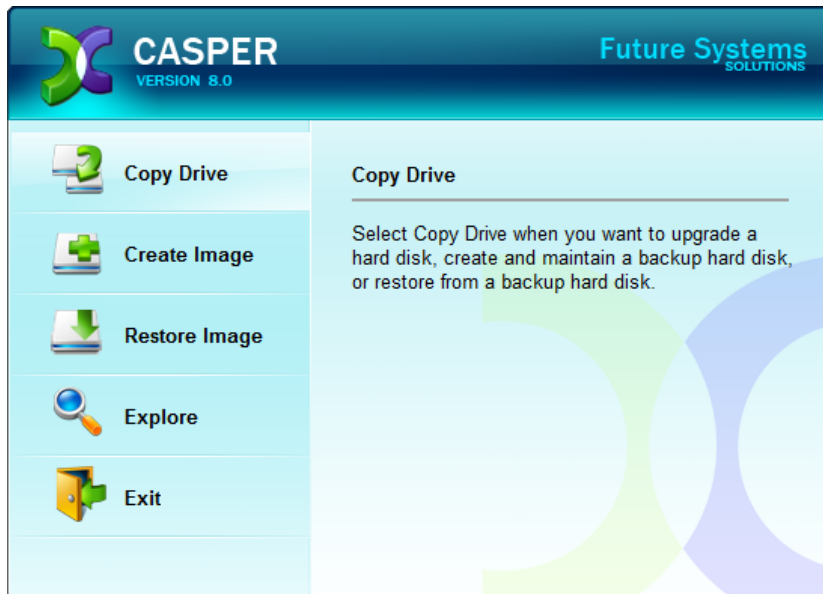
The procedure for upgrading or replacing a hard disk in a server is basically the same whether you are upgrading a single hard disk or a RAID array configured through a hardware RAID controller. The new hard disk or RAID array must be temporarily installed or configured as a secondary disk device in the computer or attached as an external disk device using an external USB, Firewire, or eSATA enclosure or bridge adapter.

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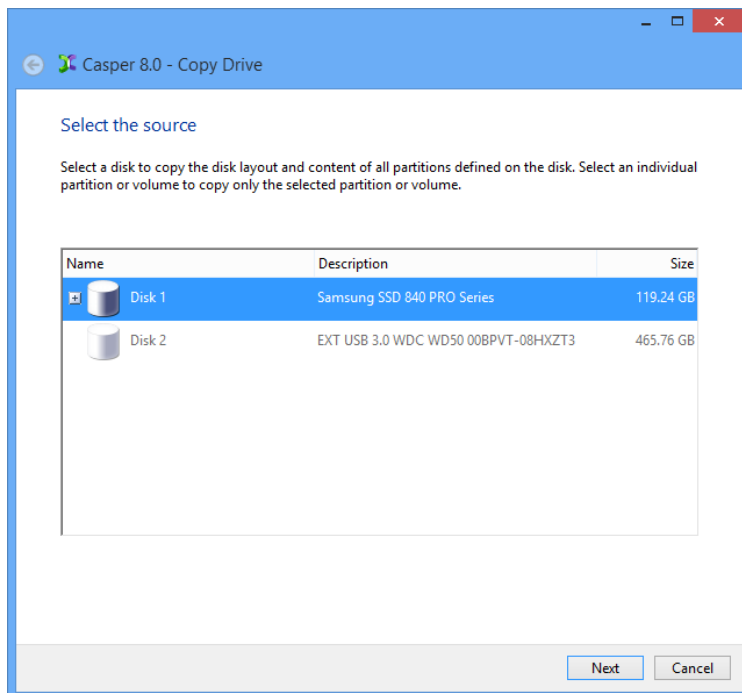
## Example 15: Upgrading a Hard Disk

Assuming the new disk device is currently installed or attached to the system, the following procedure illustrates how Casper may be used to clone the original disk device to the new disk device and complete the upgrade.

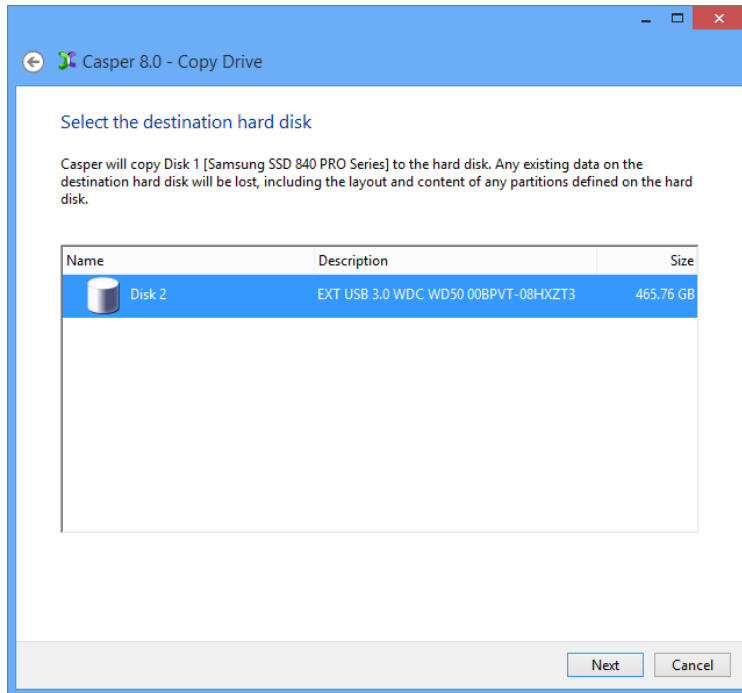
1. Select **Copy Drive**.



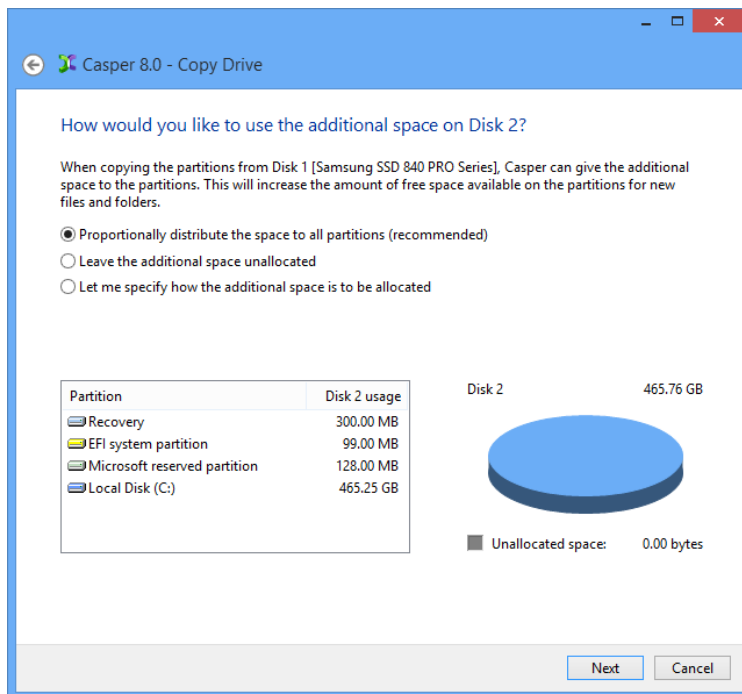
2. Select the disk device to be upgraded (e.g., the hard disk or RAID array on which Windows Server has been installed) as the source, and click **Next**.



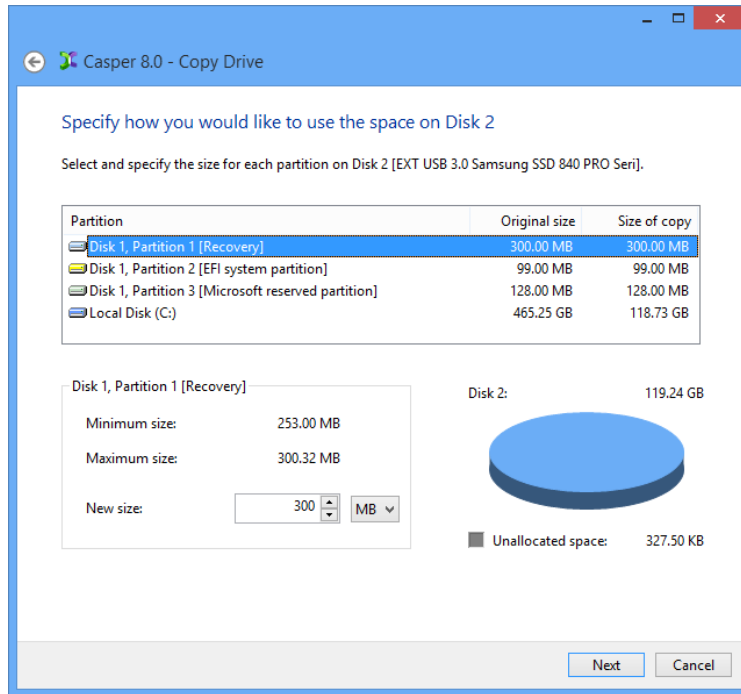
3. Select the new disk device as the destination, and click **Next**.



4. When prompted to specify how the additional space on the new disk device is to be used, retain the default selection and click **Next**. If the new disk device is larger than the original disk device, the default option will be *Give all of the space to the partition*, or *Proportionally distribute the space to all partitions* when there is more than one partition defined.

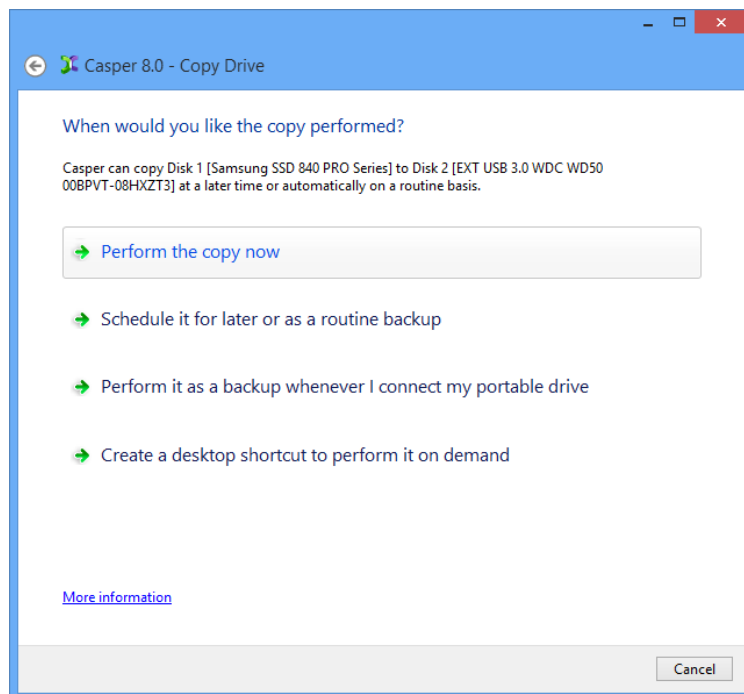


If the new disk device is the same size or smaller than the original disk device, Casper will ask you to manually configure how the space is to be used.

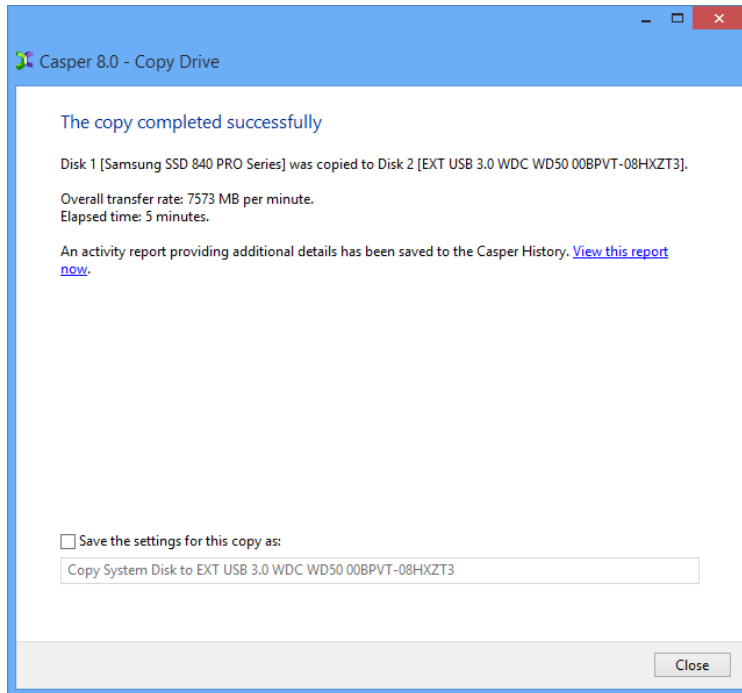


Simply clicking **Next** to accept the default selection or value is usually best. For additional help with making a selection, press **F1**.

5. Click **Perform the copy now** to begin the copy.



- When Casper has completed the cloning process, click **Close**.



- Shutdown and power-off the computer.
- Reconfigure the computer to replace the original disk device with the new disk device.