

BackupAssist™ v9

System recovery

User Guide

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1. Introduction



Recover

When a hardware or software failure occurs, it is critical that you can recover your system quickly. This guide describes how to create a bootable RecoverAssist media, and how to use that media to launch a RecoverAssist environment and quickly recover a physical server or workstation.

Recover your system using a **Bootable RecoverAssist Media** and an image backup, or a **Bootable Backup Media** that does not require a separate boot disk. Both solutions will boot your system into a recovery environment, from where you can locate a backup and perform a bare-metal recovery.

To use RecoverAssist to recover a virtual system, see our [Hyper-V guest recovery guide](#).

Licensing

RecoverAssist is a standard feature included with the BackupAssist license, and requires a BackupAssist license once the initial trial period has expired.

Important: If a RecoverAssist media is created during the trial period, it will expire. The RecoverAssist media will need to be re-created once a BackupAssist license has been purchased. This must be done after you purchase a license, if you want to have a permanent, RecoverAssist bootable media.

Supported recovery media

For a standalone bootable recovery media

- External USB hard drives
- USB thumb drives and SD cards
- CDs, DVDs and BDs

For a Bootable Backup Media

- External USB hard drives

Supported operating systems

The operating system used to make the bootable media must match the operating system in the backup you are using in the recovery. Windows Server 2008R1 and SBS Server 2008 recovery environments must be created from their own installation disks.

Recovery environments can be built from these operating systems:

- Windows Server 2016 - from v9.5 (does not include CSV support)
- Windows Server 2012 / 2012 R2
- Windows Server 2008 / 2008 R2
- Windows Small Business Server (SBS) 2011/2008
- Windows 7, 8, 10

See the section, [operating system considerations](#) section, for more information.

Important: RecoverAssist media cannot be created using a Windows Server Core installation. However, you can use a RecoverAssist media created on a Windows Server installation, to launch a recovery environment and access backups of a Core Server to perform a recovery.

2. RecoverAssist solutions

BackupAssist uses RecoverAssist to create **Bootable Backup Media** and standalone **RecoverAssist Bootable Media**. In both cases, the backup must be a System Protection bare-metal image backup.

Bootable Backup Media

A Bootable Backup Media can be used to boot into a RecoverAssist recovery environment and recover the server, without a separate boot disk. If the backup is not a full image backup or the media does not support Bootable Backup Media, a standalone Bootable RecoverAssist Media will be required.

- Created by System Protection.
- Media contains an image backup and RecoverAssist.

Advanced format (4k sector) drives using BIOS may not work in certain environments. We recommend performing a test recovery to ensure your environment is supported.

Bootable RecoverAssist Media

Standalone bootable media boots into the RecoverAssist environment and uses a bare-metal image backup on separate media, to recover the server. In some cases, Recover tab can also make a backup media into a Bootable Backup Media if System Protection was unable to.

- Created using the Recovery tab.
- Requires a System protection image backup that the recovery environment can access.

RecoverAssist overview

RecoverAssist has two parts. The builder that makes a media bootable and the recovery environment, which is launched by a standalone bootable media or a Bootable Backup Media.

RecoverAssist Builder

The builder creates a standalone bootable media using the Recovery tab. It can also be used by System Protection backup jobs to make backup media bootable. A standalone bootable media can be customized to include files, tools and additional drivers.

The RecoverAssist builder:

- Automatically adjusts the appropriate Windows settings when recovering to dissimilar hardware.
- Avoids many of the Windows Recovery Environment's *Blue Screen of Death* issues.

RecoverAssist Recovery Environment

The recovery environment loads from a standalone bootable media or a Bootable Backup Media. It provides a user interface from which you can access your backup and start a recovery.

The Recovery environment:

- Provides access to recovery tools, applications and custom drivers for standalone bootable media, or a Bootable Backup Media that was manually made bootable using RecoverAssist (Recover tab).
- Provides access to a command prompt.
- Can access backups on local or remote destinations.

Important: Please review the [RecoverAssist implementation](#) section at the end of this guide for information on RecoverAssist's firmware compatibility and supported hardware.

3. Creating a bootable recovery media

This section explains how to create a stand-alone bootable media. These steps can also be followed to manually make an backup media bootable, if the System Protection backup job could not. Launch BackupAssist and follow the steps below.

1. Select the Recover tab, and you will be presented with two options:

Create a bootable media using the installed version of Windows – RecoverAssist will use the computer you are on, and its operating system, to create a bootable Recovery disk. If the operating system requires an install disk, this option will be greyed out and not selectable.

Create a bootable media using a Windows installation disk – RecoverAssist will use a Windows operating system installation disk, to create a bootable Recovery Environment.



Figure 1: BackupAssist Recover tab – Bootable media creation screen

2. Operating system installation files selection

After you make a selection in step 1, RecoverAssist will open a dialog with one of these options:

- If you selected, **Create a bootable media using the installed version of Windows**, RecoverAssist will confirm the operating system details for the computer you are on.
- If you selected, **Create a bootable media using a Windows installation disk**, RecoverAssist will try to detect the media. If it cannot, it will ask you to insert the Windows installation disk (for the computer that the recovery media is being created for) and select the drive letter from the drop down list.

Note: OEM installations of Windows and Windows installation media provided by system manufacturers may include altered system files that could cause RecoverAssist recovery environments to fail. BackupAssist recommend the use of a Microsoft issued install disk or ISO when building RecoverAssist recovery media.

Select **Next**

3. Add device drivers

The next RecoverAssist Builder screen allows you to add your own drivers to the bootable recovery media. This is useful to ensure that the recovery environment has the ability to access backup and the local hardware. RecoverAssist will automatically select the appropriate driver to be used during the boot process.

There are 3 selections that can be used to add drivers:

- **Add drivers folder** allows you to browse to the location of the drivers that you want to add to the recovery media. Drivers should be added in an unpacked state.
- **Add compressed drivers** will unpack any compressed drivers you select and add them to the recovery media.
- **Download DriverPacks.net** will download a recommended driver pack. The drivers will be automatically downloaded and added to the media during the media creation stage.

Make your selection/s, and click **Next**.

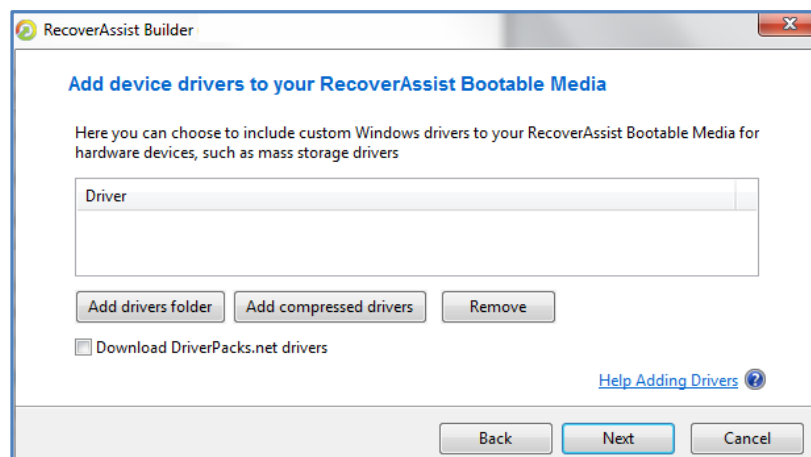


Figure 2: RecoverAssist media creation – driver selection

4. Add files/folders

The next step allows you to add files and folders to the bootable recovery media. The files and folders will be added to the UserFiles folder in the root directory of your recovery image. You can also add drivers that you do not want to be loaded when the system boots.

Make you selection/s and click **Next**.

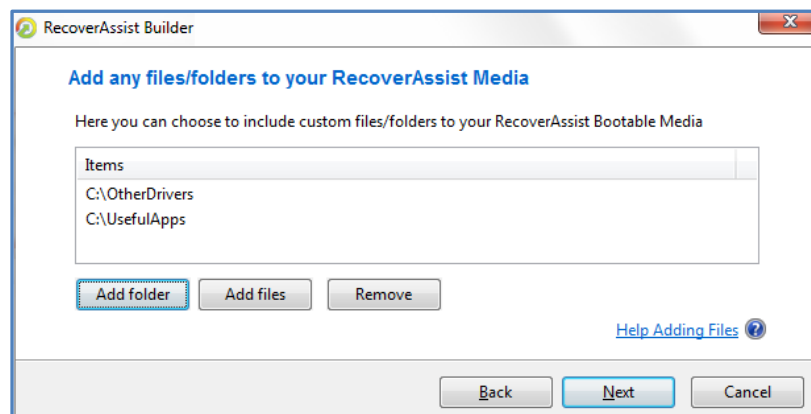


Figure 3: RecoverAssist media creation – file selection

5. Add tools and applications

The next step displays a list of troubleshooting and support tools to choose from. The applications you select will be added to your recovery media and made available during a recovery.

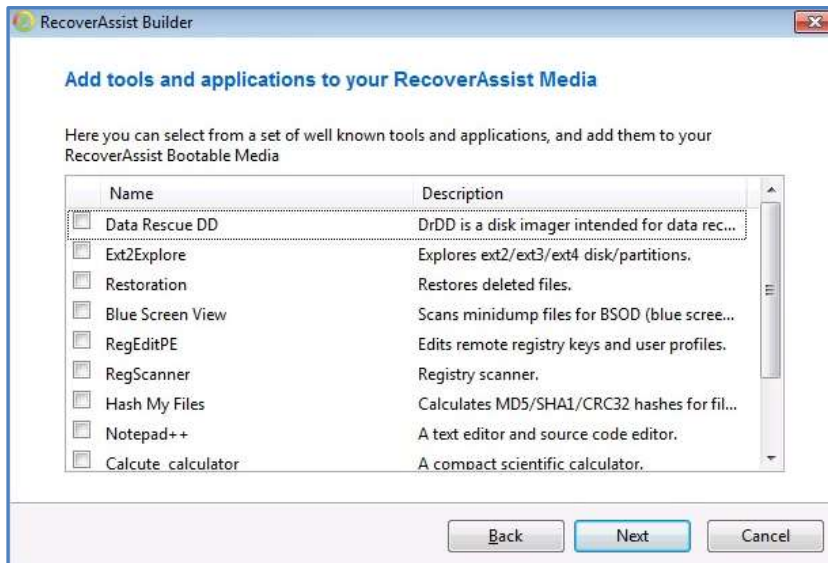


Figure 4: RecoverAssist media creation – Application selection

Make your selection/s and click **Next**.

6. Select boot media

This step selects the type of bootable media to be used.

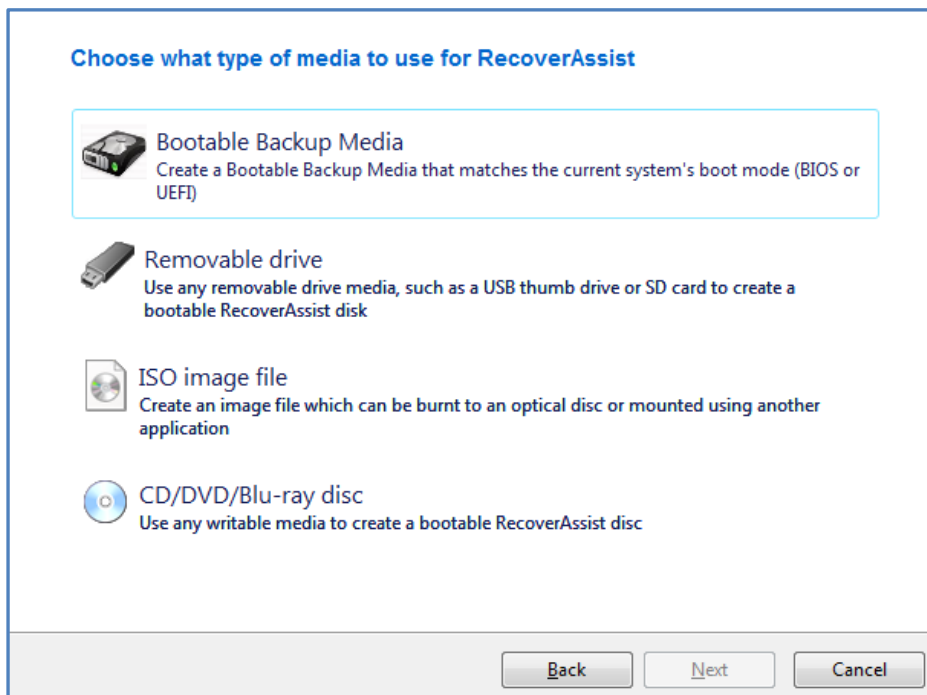


Figure 5 RecoverAssist media creation – media type selection

Select the type of media you want to use to create a bootable media. If you want to make a backup media bootable, select **Bootable Backup Media**. Review the details below to learn more about these options.

RecoverAssist media options:

- **Bootable Backup Media**

This option adds RecoverAssist to the backup media. A Bootable Backup Media can be used to boot into a RecoverAssist recovery environment and recover the server, without a separate boot disk. A warning will appear if RecoverAssist needs to format the backup media. If a format is required, all data on the drive, including any backups and backup history, will be lost.

- **Removable drive**

This option will create the recovery image on a removable drive. A warning will advise that the removable drive will be formatted before it is written to. This means everything currently on the drive will be deleted.

- **An ISO image file**

This option will create an ISO image. Although the saved ISO image is not on a bootable media, it can be used to create a recovery image that can be saved to a bootable device at a later date.

- **CD/DVD/Blu-ray disc**

This option will detect the optical drive on your computer and ask you to select the drive containing the optical media.

7. Bootable media creation

The RecoverAssist builder will create a bootable recovery media using the destination selected in step 6.

Applications selected in step 5 will be downloaded from BackupAssist and added to the media.

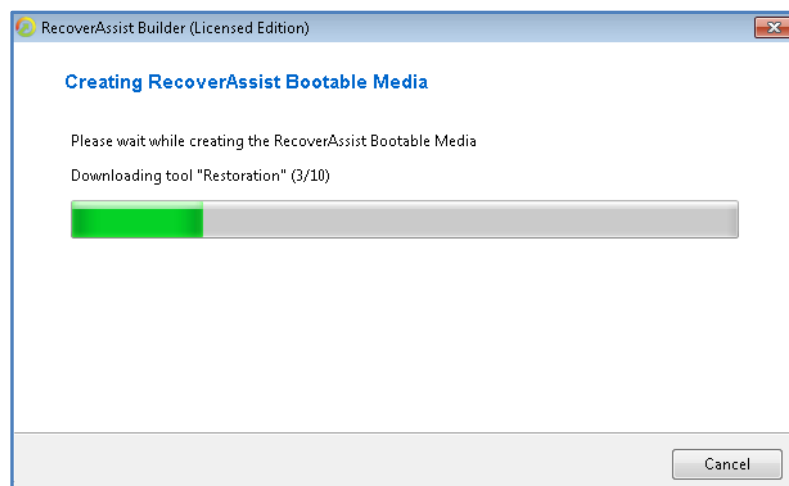


Figure 6: RecoverAssist media creation

A progress bar will be displayed. Once it has completed, click **finish**.

After the RecoverAssist media has been successfully created, you will have an option to either create an additional RecoverAssist media with same settings or close the RecoverAssist builder.

► **The bootable media has now been created.**

4. Using a bootable recovery media



The recovery process is designed to recover a server or workstation to a previous operating state, in the event of a hardware or system failure.

The recovery process will begin by starting your computer using a **Bootable RecoverAssist Media** or a **Bootable Backup Media**. The process will load a recovery environment, which you can use to select the location of the backup to be used, and to start the bare-metal recovery.

Recovery requirements

A Bootable RecoverAssist Media

This option requires a Bootable RecoverAssist Media to start the server, and a System Protection bare-metal backup. The backup can be on another media or on an accessible network location.

A Bootable Backup Media

This option requires a Bootable Backup Media. This media contains both RecoverAssist and an System Protection bare-metal backup.

Recovery process

The following steps explain how to perform a recovery.

1. Connect the bootable media

Connect /insert the **Bootable RecoverAssist Media** or the **Bootable Backup Media** to the system that is to be recovered.

2. Start the computer

Your computer should detect the bootable media and begin the boot process. Understanding the boot process can assist if a problem is encountered.

BIOS stage

The system will access its BIOS or EFI and detect the hardware needed to boot. It will display some of the steps onscreen and beep to confirm that it has run successfully. Additional beeps can indicate a problem detecting the required hardware.

EFI Systems that have been backed up must be restored by booting RecoverAssist in EFI mode
EFI Systems cannot be restored to BIOS systems and BIOS systems cannot be restored to EFI systems
EFI booting can be turned off and the system will revert to BIOS mode

O/S stage

Once the system has completed the BIOS stage, it will look for the operating system boot files. The BIOS will be configured with a device order to search for the location of these boot files. The attached bootable media must be configured in this BIOS setting (boot device order) before the C drive. To check or change the boot device order, you will need to access the BIOS configurations by pressing a key during the *BIOS stage*. The key stroke required may be displayed in screen during the BIOS post process, or noted in your hardware / server documentation.

3. Make your RecoverAssist selections

After the system has started and the BIOS messages have finished, the recovery environment will load. You will see a progress bar or a blank screen followed by an animated Windows logo, depending on the operating system being recovered. When the RecoverAssist environment has loaded, you will be presented with the following screen.



Figure 7: RecoverAssist environment

There are 6 options to choose from, and each is described below.

These options can be used to access a backup inside a Data container as detailed in step 4.

a) Recover from a backup located on a local drive

Use this option if:

- You are using a **Bootable Backup Media**.
- You are using a **Bootable RecoverAssist Media** with a separate backup on a local drive.

The Recovery Environment will scan the selected media for backup images, and display the backups that were found.

b) Recover from a backup located on a network share

Use this option to provide the location of the backups on network share. The Recovery environment will open a screen that allows you to configure the network card. Network drivers added to the RecoverAssist Builder, are automatically loaded as part of the boot process.

You can modify any TCP/IP network settings or review the automatically assigned settings, before advancing to select the location of the backup. RecoverAssist will search the specified location for backup images and display any images found.

c) Recover from a backup located on an iSCSI target

Use this option to provide the location of the backups on an iSCSI target. The Recovery environment will open a screen that allows you to configure the network card. Network drivers added to the RecoverAssist Builder, are automatically loaded as part of the boot process.

You can modify any TCP/IP network settings or review the automatically assigned settings, before advancing to select the location of the backup. RecoverAssist will search the specified location for backup images and display any images found.

d) Repair your installation of Windows

This option loads the Windows Recovery Environment and allows you to attempt a repair of the operating system files that caused the system to bluescreen or the Windows load failure.

Using the repair function is not necessary for systems that are recovered within the RecoverAssist recovery environment.

e) Launch a command prompt window

This option allows the user to launch a command prompt in order to run the various command line tools included with RecoverAssist.

The tools that can be run include diskpart.exe, bootsect.exe, regedit.exe.

f) Useful tools and applications

This option will display the applications and tools that you selected to include when you created your RecoverAssist media.

- Clicking on the name of an application will launch that application.
- These tools can be used to perform diagnostics and troubleshoot problems.

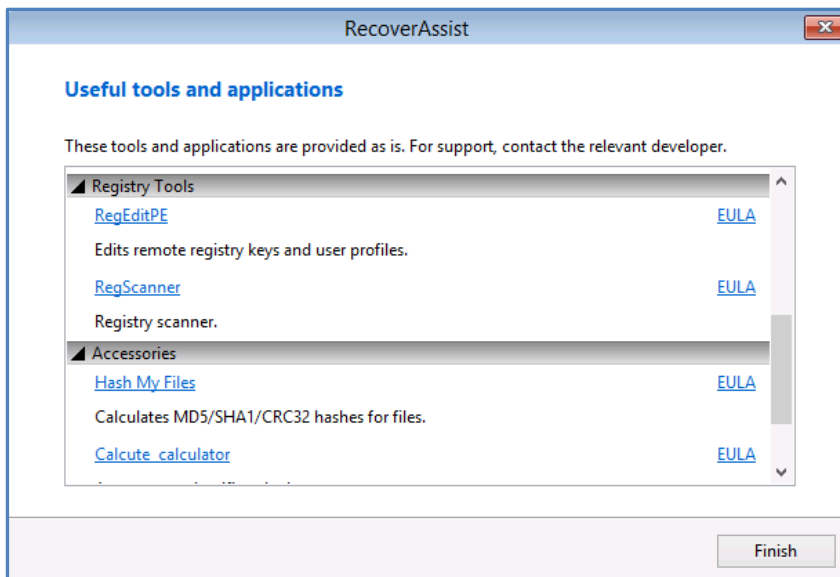


Figure 8: RecoverAssist – tool and applications

Recovery environment buttons

At the bottom of the Recovery environment UI are three buttons that provide access to additional recovery features.

- **Load driver** - loads any additional device drivers that were not included when creating the recovery environment.
- **Mount VHD** - mounts any VHD such as Windows Backup images. After mounting the VHD, you will be able to access the files using a local drive letter. This option is not used to mount Data containers.
- **Support** - configure a VNC connection. This connection can be used by BackupAssist technical support to connect to your computer and provide assistance.

4. Select an image backup

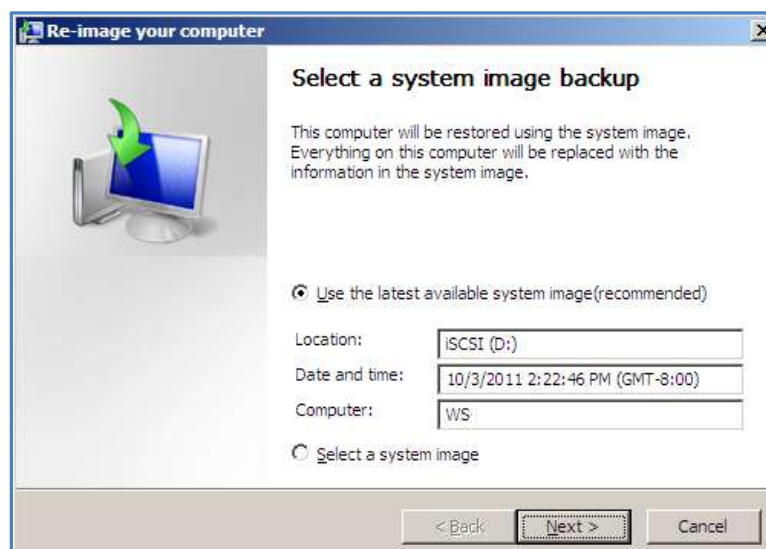
When you make your selection on the **RecoverAssist menu**, RecoverAssist will scan the selected location (local drive, network share or iSCSI target) for image backups.

- If multiple backups are found, you will be given a chance to choose which backup to use.
- If the backup is **BitLocker** protected, RecoverAssist will prompt for the BitLocker password.
- If your backup is in a **Data container**, select *Search for Backups in Container*, and select the *Data container*. RecoverAssist will display the backups that are in the container.



5. Start the recovery

Once you have selected your image backup, click *Next* and you will be presented with the **Re-image your computer** screen. The details of the backup you selected will be displayed.



Click *Next*, and follow the prompts to start the recovery.

5. RecoverAssist implementation information

The following sections should be used as check-sheet when planning and performing a recovery. The information includes a summary of information and additional considerations to ensure that your recovery works as intended.

BackupAssist's Recovery tab uses RecoverAssist to create a customized, bootable recovery media. The media will start your computer and enable access to an image backup so that you can perform a recovery of your system.

This reference section contains the key configurations and dependences that need to be considered when planning a system recovery strategy.

BIOS / EFI firmware compatibility

A computer's BIOS or EFI (a chip containing basic hardware settings) detects the hardware needed to start the computer. When you turn your computer on, the BIOS/EFI will display some of the steps onscreen and beep to confirm that it has run successfully.

It is important to know if your backup and recovery computers use BIOS or EFI because the firmware compatibility will determine your recovery options.

Backups made on a computer with one type of firmware cannot be used to start a computer that uses a different type of firmware.

The chart below shows the firmware compatibility of BIOS and EFI computers.

Firmware matrix	Backups of a BIOS machine	Backups of an EFI machine
Recover to a BIOS machine	Compatible	Incompatible
Recover to an EFI machine	Incompatible	Compatible



Important: EFI booting can be turned off. When EFI is turned off, the system will use BIOS to boot.

Operating System compatibility


The type of operating system that you are creating the RecoverAssist media for, will determine how the media can be created. There are two ways to create a bootable media using RecoverAssist:

- ❖ From the operating system's installation disk.
- ❖ Using the operating system installed on a computer.




Recovery environments can be built from the Windows operating systems shown in the table below. The color assigned to each operating system corresponds to the media creation method available, as defined in the Legend.

Note: RecoverAssist media cannot be created using a Windows Server Core installation. However, you can use a RecoverAssist media created on a Windows Server installation, to launch a recovery environment and access backups of a Core Server to perform a recovery.

RecoverAssist media creation support - by operating system

Windows Server 2016 - from v9.5 (excludes CSV)		
Windows Server 2012 / 2012 R2		
Windows 2008 R2 / SBS 2011		
Windows 8.1 and Windows 10		
Windows 7		
Windows Server 2008 R1		<p>Remember: A recovery media's operating system, must match the operating system of the System Protection backup.</p>
Windows SBS 2008		
Windows Server 2003		
Windows Vista		
Windows XP		

Legend

	Installation disks & Installed version of Windows
	Installation disks only
	Not supported

Note: Operating systems that can create a recovery environment from the computer's installed operating system, can find the option is greyed out due to the way the operating system has been installed. If the option is greyed out, the operating system's install disk should be used to create a RecoverAssist media.

Back up considerations

To perform a recovery, you will need a backup that can be used by the recovery environment. The contents of the backup and how it was made are important considerations. These requirements are explained in detail below.

The 3 critical backup requirements are:

The backup must be an image backup.

For example, a System Protection backup. This creates a set of VHD or VHDX image files.

The backup must be a full image backup of the computer.

For example, the computer's settings and operating system (as well as the data) must be in the backup.

To use a backup to recover to a computer that is different to the computer that was backed up (or has different hardware), you must have a bare-metal backup.

For example, you created a System Protection backup with the bare-metal option selected.

- ❖ Bare-metal backups are highly recommended to ensure that you have the widest range of recovery options are available.
- ❖ If a backup cannot be detected by the recovery environment, then it could be a problem with the backup. Check your backup to ensure it meets the 3 requirements listed above.

Hardware considerations

Memory: The computer being recovered must have at least 4GB of RAM.

Disks: When planning a recovery, it is important to know the details of the disks that were backed up (to create the backup), and the disks on the computer that you plan to recover (using that backup).

The 2 critical disk requirements for a recovery are:

The computer that is being recovered, must have a physical disk the same size, or larger than, the physical disk that the backup was made from.

For example, if your backup contains 200GB from a 1TB drive, the physical disk of the computer that you are recovering, must be 1TB or larger.

If the backup used in a recovery contains data from multiple disks, the computer that is being recovered must contain at least the same number of disks.

For example, if the backup image contains data from 2 physical disks, then the computer being recovered must have at least 2 physical disks.

Important: The computer being recovered must have a physical disk setup that is compatible with the computer that was backed up.