

▶ **Windows 7 Backup and Restore**

Tech Tip
by Philip Cox

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Introduction

Everyone deals with the nightmare of lost data. We all know that having a reliable backup or restore mechanism is critical to any organization that relies on the data stored in their systems. One of the main headaches from a system administration point is identifying a tool to provide reliable backup or restore functionality. This tech tip will look at one of those options. Specifically, the built-in backup or restore center of Windows 7. We will look at the latest functional changes to Windows' Backup and Restore Center (WBRC), as well as discuss practical scenarios for its use.

Overview

Microsoft has significantly improved Windows Backup and Restore Center in Windows 7. Windows 7 has improved the user interface, ability to schedule regular backups, the restore process, and much more. In my experience, it works well in environments where:

- There are a limited number of systems. I would say less than 20.
- You need basic backup and restore functionality. Requiring simple functions such as system restore or file restore from previous day (not say the previous hour).
- The cost of a more comprehensive backup and restore system is not justified based on the two bullets above.

Thus, the corollary, that if you have a large number of systems or require flexible backup and restore functions, then WBRC will leave you disappointed. With that said, let us head into what is there, and how we can use it.

Windows 7 Backup and Restore Center

I want to talk about the “What, When, How and Where” of Windows 7 Backup and Restore to give you a more robust understanding of the tool and its capabilities.

What: You can use it to backup and restore system and data files on a Windows 7 system. You can use it to perform full system restores, as well as individual files. The image-based full system backup option (i.e., *system image backup*) allows you to create an “image” of the entire system (effectively an image containing the entire contents of your system at the time you created it). You can use this image to perform a “bare metal” restore without first installing Windows.

When: The tool allows you to backup on a daily, weekly, or monthly schedule. It does not allow for hourly or other intra-day scheduled backups. However, you can always initiate a backup manually at any time.

How: The tool uses “Shadow Copy” technology (Volume Shadow Copy Service and Volume Snapshot Service, VSS) to perform the backup and restores. At the file level, the tool does not store incremental block-level changes, but stores entire files. However, when using the full system image backup, the tool does use the block-level backup features to perform differential backups of only the blocks that have changed since the last backup. This copy allows the tool to use disk space and network bandwidth (where applicable) more efficiently.

One very cool feature is that the system image backup is stored in Virtual Hard Disk (VHD) format. The VHD allows for a number of useful recovery options: You can mount it extract individual files, or boot it (using Windows 7 Enterprise and Ultimate) after the full system image backup is complete.

Where: The tool allows you to store backups on internal or external hard drives, CD or DVD RW, USB flash drives, or network shares. Some caveats:

- You cannot save backups to tape
- You cannot save a system image on an external USB flash or CD/DVD RW
- You can only save backups on a network location on Windows 7 Professional, Ultimate, and Enterprise
- You can only save *incremental* system image backups to local or removable storage, not a network location

▶ Windows 7 Backup and Restore

Scenarios

With a basic understanding of the tool let us walk through the tree most common use scenarios, and the most critical function you have when it comes to backup and restore:

- ▶ Data backup only
- ▶ Full system backup
- ▶ System image with selective data backup
- ▶ Testing your backup!

We will be assuming a corporate environment using Professional, Ultimate, or Enterprise. In addition, both local USB drive as well as backup file share.

Single Interface

Windows 7 provides a single user interface to manage the different types of data recovery scenarios we will be covering: The Windows Backup and Restore Center. We access the Backup and Restore Center in one of three ways:

- ▶ Start Menu->All Programs->Maintenance->Backup and Restore
- ▶ Start Menu->Control Panel->System and Security->Backup and Restore
- ▶ Start Menu->Search->Type backup and press Enter

Once the Backup and Restore Center is open, you will likely use one of the scenarios we listed above.

Data backup only

From the Backup and Restore Center, you can select “Set up a backup”. The wizard will walk you through the setup options:

- ▶ **Choose a location to store the backup.** I personally recommend a network share if doing a data only backup.
- ▶ **Choose what to backup.** You can let Windows choose for you, or you can choose what you want yourself. Again, for a data only backup, I would recommend choosing yourself. In addition, for a data only backup, you would want

to make sure the “create a system image” selection is not checked.

- ▶ **Set a schedule.** Assuming you want to schedule the backup, which you should, you have that option at this point. I recommend a daily schedule for data only backups.

When

You will likely use a data backup only scenario in situations where you are only concerned about restoring user data. An example of this would be an organization that has a standard system builds to restore the underlying operating system. Once you restore the operating system, you could use the data backup to restore the user’s data.

Full system backup

Again, from the Backup and Restore Center, you can select “Set up a backup”. The wizard will walk you through the setup options as previously, except you will want to make a couple different selections:

- ▶ **Choose a location to store the backup.** I personally recommend a local disk for full system backups.
- ▶ **Choose what to backup.** You will want to let Windows choose and you will want to make sure that the “create a system image” selection IS checked.
- ▶ **Set a schedule.** I recommend a weekly schedule for full system backups.

When

You will likely use the full system backup scenario in situations where you are concerned about restoring an entire system, as well as user data. An example of this would be an organization that has does not have the ability to restore the underlying operating system and programs from a standard build. This would allow a complete restoration of the system and data files as of the last backup.

► Windows 7 Backup and Restore

A combination: System image and selective data backup

Using the Backup and Restore Center, you would create two separate backups. The first would be a manual “system image” and the second would be a scheduled data backup. In this scenario, you would:

- Manually create a “system image” and store it on a locally connected disk. You would create a reminder to perform this on a periodic basis, depending on how often your system changed. This would provide you the ability to restore the system if it ever crashed.
- Next, you would perform the steps outlined in the data only backup above. This would give you the ability to restore a recent (within last 24 hrs) copy your data after restoring the underlying system. You would schedule the backup daily.

When

You will likely use this scenario in lieu of the full system backup scenario above. As this give, you the same system restore capability, but provides a more recent data backup (daily) vice weekly. The only down side to this is that you have to remember to perform the system image backup, whereas it was automated in the previous scenario.

Test your backup!

I would be doing you a dis-service if I did not cover this topic. No matter what data recovery tool you use it is imperative that you test, the restore capability on a regular basis. Since we are talking about window seven backup or restore I would recommend you conduct the following tests on a regular basis:

- **Random file recovery:** Monthly, restore one or more a random files from representative systems, to ensure that you can restore data.
- **Full system restore:** Quarterly, perform a system restore to validate that you can restore a system and the associated data.

Take to hear my axiom: You are only as good as your last restore!

Maintenance: Managing Space

One other item you will need to address is managing the space used by the Windows 7 Backup and Restore. There two areas to manage: Data backups and system images. You must manually manage the space used by data backups, but you can allow Windows to manage the space used by system images.

For data backups, you can use the Backup and Restore Center to “Manage space”. Using the “View backups” link off this page, you can delete older backups, and thus clear space in the backup location. Note that this will delete file contained in the backup period, but will not affect files in other backups. Remember, files are backed up only if they have changed since the last backup. Here is a “gotcha” scenario to illustrate how that can bit you if you delete backups:

You create a full system image as well as create a scheduled daily data backup on July 1. On July 2, you create a flyer, which is then included in the daily backup on the 2nd. You never change the file again. In September, you view the space used by the tool, and see multiple backup sets. You delete the oldest, labeled “7/1/2010 to 7/12/2010”. Later, a user asks you to restore the flyer. Guess what? You cannot, as it did not change, so was never backed up in any of the subsequent backups. Just a caveat to keep in mind.

For system images, you can use the Backup and Restore Center to “Manage space”. Using the “Change settings” link off this page, you can:

- Keep only the latest system image and minimize space used by backup: keep the latest and delete the older one. I recommend using this setting.
- Let Windows manage the space used for backup history: Windows will store older system images up to 30% of the storage area.

► Windows 7 Backup and Restore

Note that the system image options are only available only if you are storing to local hard disk, not a network share. If you use a network share, only the latest image is stored.

Conclusion

Windows 7 Backup and Restore's provides a useful tool to perform systems and data recovery. It has its limitations, but for small organizations, it is a viable option for data recovery. As will all tools, you will need to take time to learn the specifics and apply it to your situation. This tip has just scratched the surface and given you a taste of what possibilities exist.

About The Author

Philip Cox is Director, Security and Compliance at SystemExperts Corporation, a consulting firm that specializes in system security and management. He is a well-known authority in the areas of system integration and security.

His experience includes Windows, UNIX, and IP-based networks integration, firewall design and implementation and ISO 17799 and PCI compliance. Phil frequently writes and lectures on issues dealing with heterogeneous system integration and compliance with PCI-DSS. He is the lead author of Windows 2000 Security Handbook Second Edition (Osborne McGraw-Hill) and contributing author for Windows NT/2000 Network Security (Macmillan Technical Publishing).