Leo A. Notenboom

BACKING UP

Six Different Ways to Backup Your Computer

(And Which Ones You Should Use)

An Ask Leo!® ebook

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THE ASK LEO! MANIFESTO

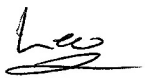
I believe that personally accessible technology is the foundation of humanity's future.

To that end, I teach people to understand and safely use personal computers and related technology so that they can do more, be more, grow more, and connect more than ever before and be an active participant in that future.

I do that by answering questions, educating on important topics and trends, and sharing my overall passion and excitement for the possibilities.

That is why Ask Leo! exists.

I hope I can help you.



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INTRODUCTION - BACKING UP AND YOU

It's been said that, much like dieting, the best backup is any backup that you'll actually use.

And also much like watching your weight, we all know we should, but many of us find excuses – it's too complicated, it's too much work, I don't know what to do...

And my favorite: I've never needed one before.

When it comes to backups, trust me, you will. The only person who's never needed a backup is a person who's new to computing. Eventually, it happens to us all.

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There are as many different ways to back up your data as there are political opinions and all have their pros and cons.

The scariest part is that by choosing wrong, you might not be as protected as you think. (I'm talking backups here although I'm sure the same applies to politics as well.)

So how do you figure out which kind of backup you need?

That's what this book is all about.

I'll present an overview of the various types of backups, what they cover, what they don't, and what things you need to consider when selecting your approach to backing up.

Nothing, and I do mean nothing, can save you from almost any computer disaster like a proper and recent backup.

This book is all about defining proper for you and your computer.

WHAT IS A BACKUP?

A backup is a copy of some or all of the files on your computer kept in a safe place. Nothing more, nothing less.

Backing up is the process of making a backup.

The goal of a backup is very simple: if something ever happens to your computer that prevents you from getting your files, *which happens much more often than people realize*, then you can always get the information from the backup copies.

Where backing up can quickly begin to seem complicated is when you discover the myriad of options relating to what to back up, how often to back up, where to back up, and the various tools to make sure that all that happens regularly.

Not to mention the myriad of opinions on the matter.

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Backing up typically takes one of two forms:

Copying your **data**. This is conceptually very simple. For example, if you copy pictures off of your digital camera, and then immediately burn those pictures to a CD for safe-keeping, you've backed them up. Similarly, if you regularly take the contents of your My Documents folder tree and copy it to another machine or burn it to CD, that's also a form of backing those files up. They're safely stored in another location in *addition* to the original.

- Copying your **system**. This is also conceptually very simple: rather than backing up only this-and-that and hoping that you actually remembered to include everything you might need in case of a disaster, this approach makes a copy of *everything*; your data, your programs, your settings - even the operating system itself.

Both types of backups share a common characteristic: whatever they backup, be it just certain files and folders, or absolutely everything, they do so by a) making a *copy* and then b) placing that copy *somewhere else*.

If your data is in only one place and there are no copies, then you're not backed up.

Let's see what that looks like and why it might (rarely) even be the right thing.

BACKUP TYPE 1: NO BACKUP AT ALL

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MARY'S STORY

Mary got a new computer about six months ago. She's been very pleased with it and has been using it almost every day. She uses Outlook, from Microsoft Office, as her email programs and keeps all of her email, documents, and much more on the machine.

In fact, Mary's quite proud of herself, as she's figured out how to move pictures from her digital camera to her computer so that she can edit them. She's actually quite the whiz at PhotoShop and has received many "Ooooh, how did you do that?" kind of comments from her friends and family.

Mary has a lot invested in her computer.

Unfortunately, Mary hasn't gotten around to setting up any kind of backup. She's been so busy with her life that the hassle of setting up a backup was something she just kept putting off.

Yesterday, her computer wouldn't boot at all. For reasons unknown, the computer simply wouldn't respond.

She took it to a technician, who gave her some absolutely devastating news:

The hard drive in the machine had suffered a catastrophic failure and could not be repaired. All the data on it was lost.

All her photos, email, documents ... everything ... were gone in an instant.

She had no backup at all.

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Believe it or not, there are situations where no backup at all is indeed appropriate. Those situations usually involve cases where total and complete data loss is **inconsequential**.

My guess is that inconsequential isn't a word that you'd use often when it comes to total data loss, which is why this is a rare *choice*. Unfortunately, it's not a rare situation.

Indeed, I myself have two or three machines that are not being backed up at all.

Yes, me.

The important point is that this is a *conscious decision* that I'm making and **not** an accident. The data on these machines is completely replaceable (so in a sense, it is backed up) and I'm consciously choosing to reinstall the system software should there ever be a catastrophic failure. Rather than take the time and space required to set up and maintain an ongoing backup, *as there would be no data loss* I'm choosing to take the pain of a re-install later if it is ever actually be needed.

If you choose not to backup, do it only as a well-thought out decision not because you never got around to it.

As I said, not being backed up *at all* is frightening common. Many people don't take the time to even consider that perhaps their computer, camera, smartphone, tablet, or other device might not be indestructible. It never occurs to them that something can go wrong and all of their precious data can be destroyed in the blink of an eye until of course, it does.

99.99% of the time having no backup at all is *completely unacceptable* if you're at all interested in preserving your information and perhaps even your entire system.

On the other hand, you are here. You're already convinced. Let's start backing up.

NO BACKUP: WHEN IT MAKES SENSE
Never. Unless you've really thought through the issues and understand the ramifications completely.

NO BACKUP: WHEN IT DOESN'T MAKE SENSE
99.99% of the time. Don't do this.

BACKUP TYPE 2: MANUAL FILE BACKUP

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PETER'S STORY

Peter has had his laptop for a while. In fact, he's kind of an old pro at using his computer and has become an informal resource for many of his friends and family when it comes to computer problems.

Peter has lots of experience with different computer programs, most of which are installed on his computer. He uses some daily and others not so much, but he can usually quickly research any problem that he's been given because he has so much ready to go on his machine.

After accidentally deleting a file some years back, Peter has developed the habit of copying whatever he's working on to a flash drive as a backup copy, just in case he ever makes that same accidental deletion mistake again.

Yesterday, Peter took his computer to Starbucks where he spent a very productive afternoon working on a memoir he's compiling. Normally, he'd copy the work to his thumb drive, but today for some reason he couldn't find it.

At one point, he went to the restroom and when he came back, he discovered that his laptop had been stolen.

While the thumb drive, which he would later find at home in his other pants, would have a copy of the memoir as it was before his trip to the coffee house, the entire afternoon of work was lost.

In addition to setting up and reconfiguring his new replacement machine a few days later, he then spend several days reinstalling all of the software that he had been using on the stolen machine and also came to realize that he had not been backing up some important files as often as he should have been.

Peter was backing up manually and had missed several important things.

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As I said, a backup is nothing more than a copy of something kept *somewhere else*.

One approach is to simply do that, manually.

By that, I mean periodically remember to copy files from your computer somewhere else: perhaps to a USB stick, an external hard drive, or even to the cloud.

It's absolutely better than nothing. But backing up manually is totally dependent on:

- You remembering to do it.
- You remembering what files you want to back up *every time*.

Now, I don't know about you, but my memory is nowhere near what it used to be and certainly not even close to what it would take for this to be an acceptable backup strategy.

But it doesn't take a bad memory for a manual backup process to end up a failure. Not realizing that some files should be backed up is perhaps the most common problem followed by the unexpected, such as hardware failure or theft (or the all-to-common situation where the computer *and the backup* are forgotten or stolen at the same time).

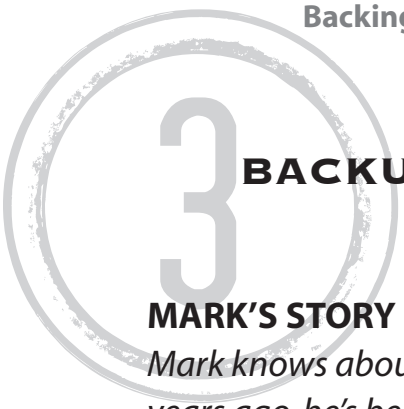
MANUAL FILE BACKUP: WHEN IT MAKES SENSE

There are scenarios where manual backups are actually the only option. The most compelling is when you're using someone else's computer - particularly a shared computer resource of some sort.

In cases where you're actually working on data that's stored on that other person's computer, you probably won't have the ability to apply some of the techniques that I'll be talking about shortly. The only reasonable recourse that you may have is to carry around something like a flash drive and make a copy of your data then and there. In fact, because you can't rely on the shared computer *at all*, you should probably carry two flash drives - one and a backup.

MANUAL FILE BACKUP: WHEN IT DOESN'T MAKE SENSE

99% of the time. Don't rely on this unless it's the only choice.



BACKUP TYPE 3: AUTOMATIC FILE BACKUP

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MARK'S STORY

Mark knows about backups. Ever since he lost the only copy of his master's thesis some years ago, he's been fanatical about backing up his data.

By getting a backup program and configuring it to automatically backup the contents of his My Documents folder to an external drive nightly, he's relatively certain that he's safe from major catastrophes. In fact, he also saves those backups for a while, moving them to another computer when the external drive he's using fills up.

If his hard drive fails or he accidentally deletes important work, he can recover the most recently backed-up copy from his external drive or x that other computer although those backups will be a tad older.

What Mark's not backing up is his system and installed programs, as well as any files he cares about that aren't somewhere within My Documents. Fortunately, many programs use My Documents as the default storage location, so he's actually in pretty good shape when it comes to things he might be working on.

Unfortunately, when his system finally crashes and wipes out the hard disk, My Documents and everything that was in it at the time of the last backup is all he has. Mark now has to go through the process of reinstalling his operating system and all applications from scratch and hope that there wasn't anything important that he would have wanted outside of My Documents.

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It's not as common as it once was, but many backup solutions - backup programs - will actually default to backing up only contents of a select set of folders on your machine. My Documents, the default location for documents, music, and a variety of other things, is of course at the top of the list.

This can be a good backup strategy if you understand what is *not* getting backed up:

- Windows itself is not getting backed up.

- Your installed programs are not getting backed up.
- Any settings or customizations that you've made to Windows or those programs is not getting backed up.
- Any files not somewhere within My Documents or any other folders the program might default to are not getting backed up.

That might actually be OK. In the case of total system failure, the risk that you run is simply that you'll need to reinstall or recreate all of the things that weren't getting backed up.

In the case of other types of failures, such as accidental deletions for example, an automatic file backup fits the bill quite nicely. It often represents a good trade-off between backing up your important files and the amount of space those backups might take up over time versus the cost of reinstalling everything in the worst-case scenario.

AUTOMATIC FILE BACKUP: WHEN IT MAKES SENSE

Automatically backing up your important data files is what I'd consider a bare minimum backup. It makes sense when you know that all of your files are in the backed-up locations and you don't mind setting up your system from scratch in the event of a catastrophic failure.

It might also make some sense if you're low on backup space as backing up your entire system will take up more space. I'll talk more about in the next section. If space on your system is the factor leading to this decision, however, I'd encourage the purchase of a larger backup drive.

AUTOMATIC FILE BACKUP: WHEN IT DOESN'T MAKE SENSE

Backing up only your data sounds great until you actually have that catastrophic failure like I mentioned. For example, if you don't have the original installation media for Windows, then backing up your files isn't enough. A replacement hard drive won't come with Windows pre-installed and you'll then have to take extra steps - and often expense - to even get a copy of Windows to reinstall.

Similarly, if the loss of all of your settings and customizations (such as bookmarks and the like) would be a problem for you, then backing up only your data files isn't enough.

BACKUP TYPE 4: AUTOMATIC ONLINE FILE BACKUP

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SUSAN'S STORY

Like many of us, Susan uses her computer for assorted tasks including writing documents for work: long documents, complex documents, and even long, complex documents.

And again like many of us, Susan likes to use the camera in her mobile phone to take p ictures. It's convenient, it's always with her, and considering that the quality of the cameras is good for casual photography, she feels that she needs nothing more.

Susan also uses more than one computer. She has one at work, and both a desktop and a laptop at home. And of course, she has her cellphone.

Susan uses Dropbox to keep files synchronized between her computers. She places her documents into a Dropbox folder as soon as she creates them and works on them in that folder rather than the default My Documents. That way, regardless of how she's left her work on one computer, her others are automatically kept up-to-date.

Susan also has Dropbox installed on her phone. She's configured it to automatically upload any photos she takes to a folder in her Dropbox. That way, they show up on her PC and she doesn't have to worry about the hassle of transferring the files by email or by hooking up a USB cable.

Susan doesn't know it, or perhaps think of it this way, but she's also automatically backing up her documents.

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First, let me clarify one thing: there are several online backup services. They are *exactly* like the automatic backup that I described in the previous section with one important difference: they store your information somewhere online in the cloud. The online aspect has pros and cons that are similar to what Susan's experiencing with DropBox, but as to exactly *what* they back up, it's often the exact same set of files that I described above: everything in My Documents, a few other select folders, and nothing more.

I'm using Susan's use of DropBox as an example to show just how easy some level of backup can be. So easy, in fact, you might not even know that it's happening.

One excellent technique to leveraging a tool like DropBox is to change the default document folder for your applications to be a folder within your Dropbox folder. For example, you might change the default document folder in Microsoft Word from My Documents to C:\DropBox\WordDocuments. Now, every document that you create will automatically get copied to the other machines on which you have Dropbox installed automatically.

When you enable the Automatic Photo Uploads setting in Dropbox on your smartphone, it creates a folder called Camera Uploads and places every photo you take there. As a result, it's automatically copied to the other machines on which you have Dropbox.

Automatic copies. That sounds like a backup to me.

Among Dropbox's other features is web access. Even if you have only one computer on which you install Dropbox, your files are automatically uploaded to Dropbox's own server so you can access those files via the Dropbox website from any computer.

The Dropbox servers are another location that stores a copy of your files. Again, that sounds very much like a backup.

I use Dropbox as the most common example here, but there are now many similar services that can perform this same task and come with varying amounts of storage capabilities for free.

AUTOMATIC ONLINE FILE BACKUP: WHEN IT MAKES SENSE

Much like Automatic File Backup above, this type of backup makes sense when you know that all of your files are in the backed-up locations and you don't mind setting up your system from scratch in the event of a catastrophic failure.

This is *exactly* the level of backup that I use for my wife's computer. I've changed the default folders for her word processor and spreadsheet programs to be a folder within our shared Dropbox. Any document that she creates or updates is automatically backed up to several computers in our home and the Dropbox online account.

I actually highly recommend this type of backup in addition to some of the more complete types of backup that I'll be discussing next. The nice thing about a utility like DropBox is that it copies in real-time; each time you save or update a file, Dropbox will do its thing.

And yes, the very document that is this book sits in a subfolder of my Dropbox folder and gets backed up every time I hit **Save**.

AUTOMATIC ONLINE FILE BACKUP: WHEN IT DOESN'T MAKE SENSE

As your only system for backups, you could face problems if you don't have the original installation media for Windows to reinstall or if losing files and settings not contained in the backed up folders would be a hardship.

In addition, online backup may not be appropriate for highly sensitive documents. The services are typically quite secure and reliable, but you have to remember that there are situations where your account could be hacked, making your information visible to others.

This is extremely rare. In fact, I continue to rely on services like Dropbox daily. But if security is important to you, you may want to use tools like BoxCryptor (specifically designed for utilities like Dropbox) or TrueCrypt to add a layer of encryption. And yes, I use each.

BACKGROUND: WHAT'S AN IMAGE?

I have to start by clarifying a term that is used by people ambiguously and often in conflicting ways.

An image is a copy of *everything* on a hard disk.

That seems fairly clear, but some people still have questions.

Does "everything" include all of the empty space on the hard drive? Does it include the left over data that's stored in areas of the hard disk that aren't currently in use? Does it even include the exact same physical layout and organization - i.e. fragmented or not?

Some people use the term image implying the answers to all of those questions is yes.

I (and others) do not.

What I'll refer to as an **image** is a copy of *all* and *only* the currently stored data on a hard disk. It includes every file, *every* directory entry, every boot sector, and file allocation record. Every bit of information that is currently marked as being used becomes part of an image. It does not include data stored in sectors that are marked as empty and it does not preserve the physical layout of the actual files on the media.

What I would call a **clone** (or perhaps sector-based image) includes every sector of data on the hard drive, used or not, and preserves the layout of those sectors.

For backing up your data, a clone is simply not necessary. It has its uses, but the average backup is not one of them.

On the other hand, images are the single most important approach to backing up there is.

BACKUP TYPE 5: MANUAL IMAGE BACKUPS

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MAX'S STORY

Max just got a new machine.

Unfortunately, Max was unable to actually get Windows Installation discs to accompany it. Windows was preinstalled and even placed on a recovery partition, but there were no actual CDs or DVDs that accompanied the machine.

Max has been here before; a few years ago, he actually had to purchase a brand new copy of Windows because his hard disk crashed and he had no installation media to reinstall Windows onto the replacement drive. He'd pleaded with the computer vendor, but they were unsympathetic, so his only recourse was to purchase that replacement copy of Windows.

This time, however, will be different.

After setting up the machine to some basic level, Max installs Macrium Reflect's free edition and immediately creates a full system image backup. That image backup contains everything on the machine, including Windows itself and any other software that came preinstalled.

Max then saves the external hard disk on which he placed that image in a safe place.

Max doesn't realize it now, but in two years when the hard drive in his computer suffers a catastrophic failure, he'll be very glad that he saved this image that he created as he'll be able to restore it to the replacement hard drive. That'll effectively put Windows back on the machine in the state it was when he got it.

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Taking image backups manually from time to time is a good thing. As Max's story above outlines, it's a fantastic way to compensate for not getting an installation DVD for Windows with your new computer. An image backup simply takes a snapshot (a picture, if you will) of the entire hard disk in its current state and saves it. Later, when needed, you can simply copy that snapshot back to the drive or a replacement drive

and return the machine back to the exact state it was in at the time the image backup was taken.

The downside of image backups is that they can take up some space. Note that Max had to put his image backup onto an external drive of some sort - media such as writable DVDs are simply not big enough to work as practical backup media for images these days. The good news is that external drives – especially ones dedicated to keeping a single image backup – are not particularly expensive.

Taking image backups manually is not necessarily part of a complete backup strategy. Any backup system that relies on your memory is doomed. That's nothing personal as it applies to all of us, including me. Your system will fail and you'll realize that the last backup that you took manually was months ago – everything since then is lost.

But manual image backups definitely have a place.

MANUAL IMAGE BACKUP: WHEN IT MAKES SENSE

Max's situation above is actually a backup scenario that I heartily recommend. When you get a new machine that doesn't have a system installation disc, make sure to take an image backup as soon as possible. Heck, even if it does come with an installation disc, take that image backup anyway because it'll be quicker and easier to restore than setting Windows up from scratch.

I also recommend that manual image backups be taken at important points in a computer's life – typically right before big changes or after large updates. For example, I often take a complete image backup of my machine before upgrading my Windows version. Many people take image backups after having installed large software packages or service packs. In all of these cases, the image backup represents a point in time that you can return your machine to if something ever goes wrong in the future. It can easily save you the hassle of reinstalling Windows and all updates, applications, and more.

MANUAL IMAGE BACKUP: WHEN IT DOESN'T MAKE SENSE

Manual image backups are not a substitute for ongoing automated backups of some sort.

Yes, any backup is better than no backup, but remember that you risk losing everything you've created or changed since the last image backup that you've taken until you take some form of additional backup. That could be as simple as some of the file-based backups I've already discussed, or it could be something as complete (and still pretty simple) as just making image backups automatically and more often.

Let's look at that.

BACKUP TYPE 6: AUTOMATIC IMAGE BACKUPS

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PENNY'S STORY

Penny's a pro. No, she's not a professional computer person by any means, but she has the experience of having been bitten by data loss due to computer failure once or twice in the past. Because of this, she understands the importance of backing up, both regularly and completely.

When she bought her current computer, she also purchased an external hard drive and image backup software. One of the first things that she did was setup the backup software to take a complete image backup of her machine every night.

Last week, she accidentally deleted an important file that she needed for work. Using her backup software, she restored a copy of that file from the backup that had been taken the night before.

But that pales in comparison to what happened a couple of months ago. She accidentally opened an attachment in her email that she thought was from a friend. In moments, her machine was infected with malware. In fact, her machine was so badly infected that there was no hope for recovery.

No hope save one. As soon as she realized how bad off the machine was, Penny calmly grabbed her backup software and restored her machine to the backup image taken the previous night before the infection happened.

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Computers are good at doing repetitive tasks automatically and making image backups is no exception.

As Penny's story outlines, having a complete backup taken for you every night (or day) can be a real lifesaver. The important points of this scenario are very simple:

- By having the computer back itself up daily, you never need to remember to do anything. The computer simply does it all for you - like we were all promised computers of the future would do!

- By taking an *image* backup of the entire computer, you can't possibly miss something. Whether you need to recover a single important file or restore the entire machine, an image backup has it all.

AUTOMATIC IMAGE BACKUP: WHEN IT MAKES SENSE

Always.

By far, this is my most recommended solution for most computer users: get and install image backup software and configure it to back up your machine nightly. If that's too often, you can tweak the dial a little bit and perhaps backup only weekly, but realize that if you need the backup for some reason, it could be as much as a week out of date. Depending on how you use your computer, that may or may not be an issue for you.

If I could get everyone to do this, I'd be a happy man. When I say "nothing, can save you from almost any computer disaster," it's this regularly scheduled image backup that saves the day.

AUTOMATIC IMAGE BACKUP: WHEN IT DOESN'T MAKE SENSE

Honestly, an automatic image backup always makes sense. Even on those machines that I choose not to backup, an automated image backup could still add a layer of safety and peace of mind. And it'd certainly not hurt to do.

If I have to make a case, the biggest arguments against automated image backups might be disk space and timing. When these are an issue, I would recommend getting a larger backup drive (believe me, it's worth it) and setting a time. Machines left on 24-hours a day can backup overnight, but machines that are not left on like that may backup while you're using them. That's typically not an issue. Backups are so *important* that I'd argue that it's worth setting up a mechanism where you regularly leave the machine to do its work without interfering with yours.

Again, no arguments against automated image backups, just situations where additional accommodations might be needed. Trust me, they're worth it.

BUILDING ON A THEME: WHAT'S AN INCREMENTAL BACKUP?

One of the terms that gets thrown around a lot when you're dealing with backup software is the concept of an incremental backup. While it's mostly used when discussing image backups, it actually applies to almost any kind of backup and is essentially what most file-based backups really are.

Here's the deal.

When you backup for the first time, the backup makes a copy of all of files that you're backing up. That's sometimes referred to as a full backup.

Now, every time that you back up, you could always perform a full backup. That means that the backup you make today actually makes copies of all the files – whether they've been backed up before or not. Again, that's a full backup.

An *incremental* backup takes into account that you've already backed up some files. Rather than making additional copies of all the files, it only copies those files which have changed since the last backup. If no files have changed, then an incremental backup copies nothing. If only one file has changed, then only that one file is copied, and so on.

The big advantage to incremental backups, especially incremental *image* backups, is the reduction in space. A full backup is as big as all of the files being backed up, but an incremental backup taken thereafter is only as big as the files that changed. The net result is that you can keep many more incremental backups on hand than you can full backups given the same amount of disk space for your backups.

The downside to incremental backups is that each contains only the files that changed since the previous backup. That means if you need to restore *everything*, you need to start with that initial full backup and then carefully restore each incremental backup taken thereafter until the point in time to which to restore.

The good news is that you rarely need to worry about that process. Backup software handles it all automatically. All you need to do is make sure that you keep each starting point – the full backup – and all of the incremental backups that were taken thereafter.

THE BOTTOM LINE: A SUMMARY OF MY RECOMMENDATIONS

Now that you have an idea of what the different approaches to backing up can be, hopefully you'll have a sense of what might apply in your situation. If you make the decision that no backup at all is perfectly OK, then that's fantastic!

I also expect that to be very, very rare.

If you're still not sure, here's my recommended set up. When done properly, this will protect you from just about anything that can go wrong:

- Get an image backup program and an inexpensive external hard disk and take an initial system image of your machine. Save that somewhere until the day that you no longer have that machine.
- Get another external hard disk, probably bigger this time, and configure your image backup program to back it up daily. If you're not sure, do a monthly full backup followed by daily incremental backups and keep two months worth. (Many backup programs can be configured to automatically handle the disk space housekeeping for you.)
- Install a utility like Dropbox and set up a free account. Install it on all your computers if you have more than one.
- Change the default folder for the programs in which you create or manipulate data files – like your word processor or photo editing software – to use a folder you create within your Dropbox folder.

Seriously, that's about it. You'll have nightly backups to protect your system from just about any disaster, along with real-time backups of the files you're working on currently.

And yes, that's how I roll.

Let me discuss in a little more detail the software that I've mentioned so far.

DROPBOX

I keep recommending Dropbox because it's the simplest and most feature rich of the

various alternatives. You get two gigabytes of storage for free and can pay for more if you like. Particularly when it comes to things like documents, it's a good, solid solution.

Other programs come with different capabilities and differing amounts of storage either free or paid. Just a few of those include Google Drive, Amazon Cloud Drive, MicroSoft SkyDrive, Box.net, Ubuntu One, SugarSync, SpiderOak, and many others. All provide software that you install on your machine to handle the automatic synchronization across machines and automatic backup of those files to servers on the internet.

BOXCRYPTOR

BoxCryptor is a fairly unique encryption solution that is specifically targeted at people who use the tools that I just mentioned, but are looking for an extra layer of security. BoxCryptor runs alongside the software on your computer and automatically encrypts the files you place in Dropbox or another storage system before they're uploaded to that system's servers. This extra layer of security ensures that only you will be able to access those files by having provided the proper password.

As I mentioned earlier, most of the file synchronization services and online backup services store your data on their servers in a way that could be compromised by a malicious employee or be retrieved in response to a court order. Doing your own local encryption prevents that from being possible.

TRUECRYPT

I mention TrueCrypt because it's another way of protecting your sensitive data. In fact, I keep my most sensitive data in a TrueCrypt container that is synchronized across various machines using DropBox. It's a little more cumbersome to use because it's not really designed for file synchronization utilities like Dropbox. I've been using it this way for a couple of years and recommend it as a highly secure approach to backing up important data as well as keeping it synchronized across multiple machines.

MACRIUM REFLECT

Macrium Reflect is my backup software of choice. I regularly recommend it. Specifically, the free version will allow you to take full image backups, whereas the paid version (well worth it, in my opinion) adds the ability to schedule and the ability to perform incremental backups.

There are other alternatives, but I honestly believe that backing up is not a place where you want to skimp. Whatever program you select make sure it supports:

- Image backups
- Incremental backups
- Scheduling
- The ability to restore individual files extracted from a backup image
- Its own bootable rescue/restore media

And of course, you'll want to make sure that the software itself is supported by the company that makes it. This turns out to be a surprising differentiator in the backup software market.

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GET MORE DETAILS: MY MAINTAINING WINDOWS 7 BOOK

I have to also throw in a little plug and recommend one more thing.

My book: *Maintaining Windows 7 - Backing Up.*

This book has been an overview of the various backup types that are possible, what their pros and cons are, and what you might use when.

Maintaining Windows 7 - Backing Up takes things to the next level. It includes step-by-step instructions to backup your computer using either Windows own included backup software or Macrium Reflect.

After purchasing the book, you'll also get access to online companion videos that actually show you each step of the process and walk you through setting up your backup and even restoring files ... or the entire computer.

It comes in PDF, .epub, or .mobi (aka Kindle) formats or you can purchase it directly from Amazon. Regardless of where you get it, you'll receive access to all formats and the additional online videos once you've registered.

AFTERWORD

I hope this book has helped clear up some of the confusion around backing up and that you'll now make sure that your data is backed up and safe from all of various things that can go wrong when it comes to computers and the internet.

If you find what you believe to be an error in this book, please register your book and then visit the errata page for this book. That page will list all known errors and corrections and give you a place to report anything you've found that isn't already listed.

If you're left with questions, suggestions, or – dare I say it – even complaints, then by all means, let me know. Once again, the best way is to register your book. That'll give you access to a prioritized feedback form specifically for Backing Up 101.

If you prefer not to register, you can use this form: askleo.com/book

That's the Ask-a-question form for newsletter subscribers and book purchasers.

If you have a more general technical question that's perhaps not related to what's covered in this book, I strongly encourage you to visit Ask Leo! and search the site for your answer. I know I often sound like a broken record on this, but I get asked so many questions that are answered already on the website that you'd be shocked. It'll be faster for you if you can simply find it there first, rather than waiting for me to get back to you.

If you do need to ask a question that's not answered on the site, use that Ask-a-question form that I mentioned above: askleo.com/book

If you haven't already subscribed, you might find my weekly Ask Leo! newsletter helpful as well. Each week, I highlight the latest articles published on the site, reader comments, popular articles, and recommendations along with some my own commentary and musings from time to time. Learn more about the newsletter and sign up here: newsletter.askleo.com

Thanks again for your support.

Here's to happy, safe, and problem-free computing.

Leo A. Notenboom
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ABOUT THE AUTHOR

I'm Leo Notenboom and I've been writing software in various forms since 1976. In over 18 years at Microsoft, I held both managerial and individual contributor (i.e. programmer) roles in a number of groups ranging from programming languages to Windows Help, Microsoft Money, and Expedia. Since leaving Microsoft, I've been answering tech questions at the extremely popular Ask Leo! website (askleo.com) and expending my efforts on various consulting and entrepreneurial projects ... like this book!

Curious for more? Someone asked and I answered on the site: Who is Leo?

FEEDBACK, QUESTIONS AND CONTACTING LEO

I truly appreciate reader input, comments, feedback, corrections, and opinions – even when the opinions differ from my own! (Honest!)

Here's how best to contact me:

- If you have a computer or tech-related question, the best approach by far is to first search Ask Leo! (askleo.com). Many, many questions are already answered right there, and finding those is much faster than waiting for me.
- If you can't find your answer using search, visit askleo.com/book and submit your question. That's a special form just for book purchasers and newsletter subscribers, and it gets prioritized attention.
- If you have a comment on any part of this book, register your book for access to a prioritized feedback form. If you prefer not to register, simply use the form mentioned above to let me know. Just mention "Backing Up 101" in your comment. Even though I may not reply, every comment is read – honest

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