EPIC EDITS

Your Complete Guide to Photo Backups

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1. An Intro to Data Security

photo credit: montini

([See this chapter online](#)) Backing-up your photos is definitely important, but more important is getting in the habit of doing so. As time goes on and our skills increase, we tend to take more photos. Cameras keep getting bigger and pumping out more pixels too. I recently wrote about [my exponential photo collection](#), and this illustrates what I'm talking about. If you don't have good habits with your backups right now, you'll be in a world of hurt one or two years down the road.

This eBook covers all the major methods of making backups, including RAID towers, external hard drives, DVDs, online solutions, and more (but not necessarily in that order).

To start things off, here are some articles I've come across that cover various aspects of photo backups.

Backup - Wikipedia

This Wikipedia entry seriously goes into backup methods and the management of backups. Most of it is probably overkill for many photographers, but it's interesting to see just how far this stuff goes.

5 Ways To Never Lose Your Photos

Jim Goldstein presents some good solid methods for backing-up, and some things to think about while securing your photos for the long haul.

My Photo and Computer Back-up Strategy

Scott Kelby lays out his backup techniques and some of the hardware he uses to do so.

5 Ways to Store Your Photos

Five of the basic methods and pieces of hardware for storing your photos outside of your internal hard drive.

Digital Workflow: Preserve Those Captures

If you think you're doing enough to backup your photos, take a look at this article by Jim Talkington. From a pro's perspective, this is all just a part of doing business.

Organize: Part 3 - Seeing it Through

Neil Creek touches on the topic of backups in this article about photo organization.

Back Up Your Photos on DVD

The DVD backup may not be the best method of backup, but it should still be considered essential as a secondary method.

5 Steps to Securing your Data

Backing-up is just one part of securing your data (photos). Here are some tips for additional activities you should be doing.

See this chapter and reader comments online

2. It'll Cost You

(*photo credit: pfala*) Digital photography is often thought of as "cheap" or "free" when it comes to snapping away. True, you don't have to shell out the bucks each time you use your camera (as is the case with film). Also true is the fact that storage media is inexpensive.

But the brutal truth of photography, film or digital, is that it costs money to take and store photographs. And if you get serious about your photos and protecting them from loss or damage, the expenses only go up.

As your photo collection grows, you'll need **more hard drive space**. Backing up those photos on other hard drives, DVDs, and online services - they all cost money. Additionally, things like hard drives and DVDs have a **limited shelf life** — so they'll eventually need to be duplicated and / or replaced.

My point is this: Save some money for storage and backups. The costs are recurring and ever-increasing. What good is that $800 camera body you just bought if you don't have anywhere to put the photos? And how bad would it hurt if you lost all your photos from a hard drive crash and you had no backups?

Photo storage and backup is an essential part of photography. Don't skimp on this stuff.

See this chapter and reader comments online

3. When Disaster Strikes

photo credit: rust.bucket

([See this chapter online](#)) Nobody plans on having a catastrophic disaster. These things happen sometimes, and they can cause a huge loss of personal items including your photo archives. Sometimes you can avert disaster, while other times you just have to be prepared for the worst. As we slip into chapters, here are some things to think about when planning for the unexpected.

HARD DRIVE FAILURE


📷 *photo credit: Gil De Los Santos*

This one should be the most obvious. We keep our photos on a hard drive so we can access them and work on them. Hard drives spin around in circles and have a little arm that moves to read the data. A mechanical device equals potential for failure. Not only that, but most of us have encountered a hard drive failure or some other issue at some point in time. Older hard drives are a greater risk, but that's not to say that your brand new disk can't crap out in an instant.

HOW TO PROTECT YOURSELF

Keep your work backed up! That's what this eBook is all about. You need to have duplicates of your photos in the event that your main working hard drive fails. It's also recommended that you update your hardware every couple of years. Don't get a new computer and just keep using the same old hard drive to save $100.

COMPUTER VIRUS
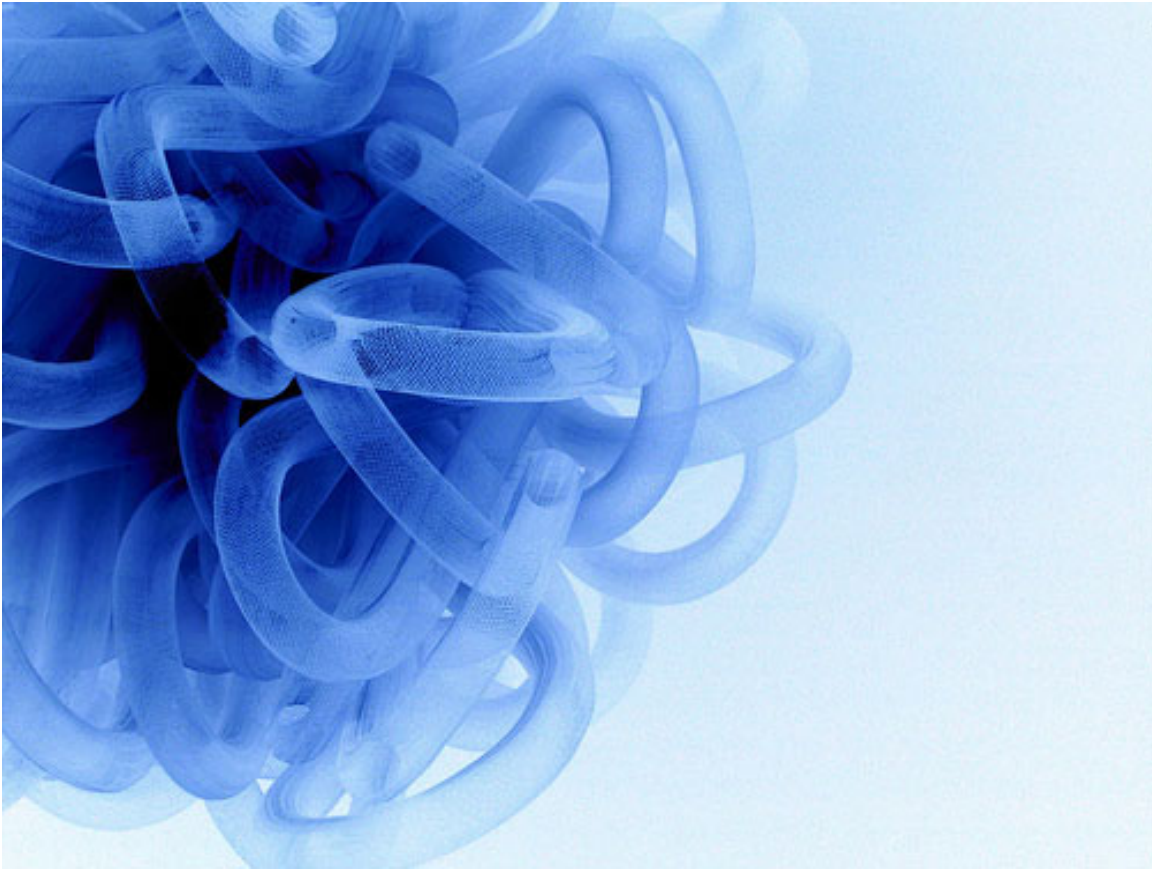
photo credit: twenty_questions

Computer viruses are more common than real viruses. These things can do all sorts of bad stuff to your computer and your files if you're not careful. Get the wrong bug and you could lose all of your files in one fell swoop. Are you connected to the Internet? Yeah, you are. Enough said.

HOW TO PROTECT YOURSELF

Again, keep your work backed up! But in addition to that, you need to keep your computer healthy and bug-free. Use anti-virus software to protect yourself from all the bad stuff out there. Don't want to spend the money on the software? Check out the Google Pack and get some free virus scan software. Don't be dumb, just do it.

ACCIDENTS HAPPEN

photo credit: mxlanderos

We're all human — just admit it. And thus, we're all prone to accidents. Transferring files to a new hard drive, setting user permissions, attempting backups, hardware upgrades, spilled drinks, etc, are all feasible way to lose vast amounts of digital information stored on your computer. Plus, if you're like me and you have multiple users on the same computer (wife, kids, guests, etc.), you run the risk of other people screwing up your photos.

HOW TO PROTECT YOURSELF

Not to sound redundant, but keep your work backed up! Aside from that, be aware of the risks you're taking when transferring large amounts of digital information or upgrading hardware. Always COPY & PASTE, then DELETE, rather than CUT & PASTE if you're moving everything to a new hard drive. If you have multiple users, you might even consider blocking their access to your valuable photos — set their permissions to read-only. There's nothing worse than a 5-yr-old deleting most of your photos — you can't even get mad at them!

POWER SURGE

photo credit: Leorex

Computers are finicky little things when it comes to power requirements. One minute you're working away on your computer during a thunderstorm; the next minute you're computer gets totally zapped by lightning. But electrical storms aren't the only things that can cause power surges — I guarantee that an incident at your local power plant won't be a scheduled event.

HOW TO PROTECT YOURSELF

Yeah, duh… keep your work backed up. But you should also be powering your computer via a surge protector. These handy little contraptions prevent power surges and power outages from killing your computer and every photo sacred to you. Don't skimp on this one, go for the surge protector with battery backup (called a UPS or uninterruptable Power Supply) so you have some time to save your stuff and shut 'er down in the event that you lose electricity. It's also wise to just stay off the computer during big electrical storms… watch a movie instead.

NATURAL DISASTERS

Nobody plans on their house being burned down or a tornado ripping it from the foundation, but these things happen… and often without much warning. Natural disasters can be devastating, and their effect on your photo archive is no exception. It's a scary thing to hear that you must evacuate your home, but it's even scarier to realize that you can't take much of your life with you.

HOW TO PROTECT YOURSELF

Backups can be destroyed too, so a good backup strategy is the key to safeguarding your photo collection. If you find yourself face-to-face with a natural disaster, you may or may not have the opportunity to grab your photos. In the event that you don't, offsite backups may be your only savior.

ROBBERY

photo credit: volvidejapon

Being robbed sucks. I've had things stolen from me, but I'm lucky that my photos haven't been the target. If your home is robbed, computers are often whisked away because they contain so many pricey little parts boxed up into a handy little package. What really sucks is that this is the kind of thing that happens with absolutely no warning.

HOW TO PROTECT YOURSELF

Um… backups. But being smart about your backups is also important. Offsite backups are a good way to thwart robbers from leaving you high-and-dry. A safe is also a good option — as long as it's bolted to the floor. Other than that, keep your doors locked!

See this chapter and reader comments online

4. Working Drives

	Cost	Performance	Simplicity	Scalability	Security	Portability	Accessibility
Main Internal Drive	green	green	green	orange	orange	red	orange
Separate Internal Drive	yellow	green	yellow	yellow	yellow	red	orange
External Drive	orange	red	green	green	red	green	yellow
RAID Tower	red	orange	yellow	green	green	yellow	yellow
Network Drive	red	yellow	red	green	green	red	green

(See this chapter online) A good photo backup strategy starts with your working hard drive(s) — the place you use to store, access, and work on your photos. If you don't have a clean system for keeping your original copies, your photo backups are going to be a nightmare — especially if you've got stuff strewn between several computers and various external hard drives (you know who you are).

There are several basic options for working drives, and they all have their pros and cons. You may not be ready to completely change your game plan right now, but this could be something to think about the next time you upgrade your computer (or run out of disk space).

MAIN INTERNAL DRIVE

(photo: Jason Schlachet) Computers require a hard drive to operate and that hard drive usually has some extra space on it for your personal documents. When you journey into photography, this main drive is usually where the photos get stored.

P R O S — performance, simplicity, cost. Today's computers have plenty of hard drive space, usually sporting between 200 and 500 GB of capacity. Unless you're shooting with a pro-level camera (and doing lots of it), this hard drive space will probably last a while.

Internal drives are great for speed too — with the latest SATA 3.0 drives clocking in at 3 Gbit/s (or 375 MB/s) communication rates.

C O N S — scalability, security, portability. If you keep shooting, you will run out of space at some point. Plus it's a pain to transfer photos when you decide to get a new computer. You also have to consider that you're sharing space with your operating system — that disk is constantly working overtime just to keep your computer running. More use of a drive can mean a quicker unexpected death.

SEPARATE INTERNAL DRIVE

(© *photo credit: isdky*) Most computers have the space and connections to accommodate multiple hard drives. One drive can be used for your OS and your standard documents, and the other drive(s) can be used just for photos.

P R O S — performance and scalability. Internal drives are way cheap and they come in many sizes to suit your needs. Since they're connected straight to your motherboard, you'll be enjoying quick performance while organizing and processing photos. If your photo drive fills up, you can get another one. And when you switch computers, you'll probably be able to just transfer the drives over without issues.

C O N S — cost, difficulty, portability. I said they're cheap, but they still cost more than nothing. There's also a constant shift in technology that tends to obsolete hardware like hard drives. Then again, it's a good idea to get fresh drives every few years. You just have to make sure that you're getting the right type of hard drive to go with your motherboard — and you have to pull the computer apart to install it.

EXTERNAL DRIVE

(© *photo credit: alex-lawrence*) An external drive is just an internal drive with a plastic box around it. They are typically connected to the computer via USB or Firewire, and juiced up with an external power supply.

P R O S — simplicity, portability, scalability. Most external drives are pretty easy to set up and use — just plug it in and use it. They're also nice in the fact that they can be moved from one computer to another in very little time (handy for those who use a desktop and laptop). It's pretty simple to expand your photo collection with external drives too — just get another one and plug it in.

C O N S — performance, cost, fragility. External drives cost more than internal drives because they have a convenience factor and they're covered in extra hardware. They're also free-standing units, which means that they can get bumped and knocked off the desk or shelf. External drives also tend to be slower than internal drives when reading and writing data.

RAID TOWER

(*photo credit: Thomas Hawk*) RAID (Redundant Array of Inexpensive/Independent Disks) is a type of technology that uses two or more hard drives to achieve better performance and/or reliability. Similar to an external hard drive, RAID towers are just a box with multiple drives inside (but they have a brain too).

P R O S — security, scalability, accessibility. The great thing about a RAID tower is that it protects itself against most hard drive failures. If one drive fails, pull it out, put a fresh one in, and let it rebuild your data. You can also upgrade your drives for additional space as the need arises. Most towers are also geared to attach to a network, so you can access them from several computers through a router.

C O N S — cost, performance. These boxes are not at all cheap — because they're much more complex than a simple external drive enclosure. Some are like little computers on their own. Recent towers have gotten faster with data transfer rates, but an internal SATA 3.0 (375 MB/s) drive is still going to outperform anything external — even if it has multiple USB 2.0 (60 MB/s) ports, Firewire 800 (100 MB/s), or eSATA (120 MB/s) connections.

NETWORK DRIVE

(*photo credit: david*) There probably aren't too many people who would need this option, but it can be handy in a professional environment. A network drive is basically just a hard drive (or set of hard drives) that live in a dedicated file-server.

P R O S — accessibility, security, scalability. When networked, these drives can be accessed from multiple other computers and even across the web if you have the technical know-how. Good for a studio environment where many computers are used and workstations are upgraded regularly.

C O N S — cost, difficulty, portability. In addition to the drives, you'll be paying for the extra computer hardware and the network equipment. Then you have to be

knowledgeable in the fine art of networking computers. Plus you'll have another computer that needs upkeep on the software and hardware.

IN CONCLUSION

A good photo backup strategy starts with your working hard drive space. There are many options available to give you the performance and flexibility you need. The main things you need to consider are cost, performance, simplicity, scalability, security, portability, and accessibility. The most important thing is to find a solution that works for you, and be prepared to change your mind about your current setup as you get pulled into the hobby/career of photography.

See this chapter and reader comments online

5. Internal Hard Drive

([See this chapter online](#)) Our options for backup hardware are much the same as the working drives, but we have a few other options too. To kick off this chapter, we'll go over the use of internal hard drives as backup hardware.

THE BASICS

(ⓒ *photo credit: veeliam*) **An internal hard drive is simply a hard drive housed within your computer case and attached to its power and data connections.** All computers have at least one internal drive to run the operating system, but an internal backup drive is one separate from your main drive. Simply creating a copy of your data on the same hard drive won't give you much data protection. Most computers have more than one power supply cable and hard drive data connection, so installing a second, third, or even fourth drive should be no problem.

Hard drives come in all different flavors. Common **form factors** include 3.5" (commonly found in desktops) and 2.5" (commonly found in laptops). Let me just interrupt the flow to state that this chapter is based on the

assumption that you're using a desktop computer with 3.5" drives — laptops don't usually have too much extra space for additional drives. Hard drives also come in a multitude of **disk interfaces** (or the shape of the data plug). The SATA interface is most common today, but some computers are still supporting the old ATA drives. SCSI (pronounced "scuzzy" if you're a geek) is not terribly common, but some people still use them. And I'm sure that by the time I publish this eBook, the next best thing will have made the SATA drive obsolete.

So my point is this: make sure you know what type of drive you can plug into your computer. Don't jump on that ATA drive because it's cheap, only to find out that you can't even plug it in. Also beware of differences within a particular interface — for example, we've got SATA 1.5 Gb/s, SATA 3.0 Gb/s, and now SATA 6.0 Gb/s is in the works. So again, figure out what you need before you buy.

BACKING UP

(ⓒ *photo credit: ★ Lezarderose ★*)   Internal hard drives can be used as backup drives a few different ways. **The simplest method is to install the drive as a secondary drive**, or extra storage space, and use some type of software backup utility to make a copy of your chosen data from your main drive. We'll talk about software options later, but most operating systems (excluding Vista) give you the ability to make backups of specific files and directories.

Another method is to use the drive as a mirror (or RAID 1) configuration. A mirror is simply a disk that is a duplicate of another disk or portion of a disk (like your photos), usually updated in real-time. For this, you'll either need a piece of software or hardware (like a RAID controller) to manage the mirror operations.

The last major method of internal drive backup I'll talk about is a full-blown RAID 5 configuration. This method will require at least 3 separate internal drives and a RAID controller to work (though I believe that some distributions of Linux can do this via software). A RAID 5 setup utilizes these 3 or more drives as a single drive with the data spread across them in a manner that allows one drive to fail and your data to remain in-tact (of course the failed drive has to be replaced though).

STRENGTHS

(ⓒ *photo credit: Brian Auer*)   **Internal hard drives are fast, cheap, and they stay out of your way.** They won't clutter up your desktop or get knocked off the printer stand because they're bolted to the inside of your computer case. They also have fairly high capacities given the

cost — 1TB drives are not so uncommon. Drop down to 500GB or so and you can pick one up for much less than $100.

WEAKNESSES

(📷 *photo credit: Sumit*) Well… for starters, it's sitting right next to your main drive. This means that **you're not protected against theft, fire, lightning strikes, computer viruses, and spontaneous combustion.** If something happens to destroy your main drive, it's probably going to destroy your back up drive as well. It does protect against a random hard drive failure though, which is more common than most other catastrophes. **The other downside** to the internal drive is that you can't pack it up and move it around or store it off-site without lugging your whole computer along or ripping it apart.

CONCLUSIONS

Extra internal drives can be a very feasible backup solution. They're certainly better than nothing, and you have a couple of options for how you set up the drive to interact with your other internal drives. If you do choose to go this route, I'd strongly suggest a secondary backup plan (which is something I'd suggest anyway). Just don't get stuck in the notion that you need an external hard drive to backup your photos — which is what we'll be talking about in the next chapter.

See this chapter and reader comments online

6. External Hard Drive

photo credit: pietel

([See this chapter online](#)) I would expect that most people are familiar with external drives, but we'll go through their various aspects, strengths, and weaknesses as it relates to backing up photo archives.

THE BASICS

(*photo credit: pietel*)   An external hard drive is simply an internal drive that is housed in some type of case and connected to your computer via external data cables. Some external drives require auxiliary power, while others are powered by the data connection (such as some compact USB 2.0 drives). External drives serve as good backup hardware because of their storage capabilities and portability.

Like internal drives, **external drives come in various shapes and sizes**. Some are considered "compact" drives (typically housing a 2.5" drive) while others are slightly larger

(typically housing a standard 3.5" drive). While the casing may look different between brands and models, most external drives have the same basic anatomy.

Also like internal drives, **external drives may have several variations on the data connection interface** — but these connections are different than those discussed on the internal drives. One typical connection type is USB, and most often USB 2.0. But external drives can also come with Firewire connections and even eSATA connections.

Again, my point is that **you need to be aware of the capabilities of your computer(s) before purchasing an external hard drive**. Maybe the one you've got your eye on is a Firewire drive, but your computer doesn't have Firewire connections. This will result in you having to either return the hardware or purchase additional hardware in order to make it work.

BACKING UP

(⬡ *photo credit: Elsie esq.*)   Just like with the internal drives, external drives will give you a few options for methods of backing up your data. There are two basic camps of people who use external drives: connected all the time, and connected only when backing up files.

If you decide to leave your external drive permanently connected to your computer, it may be possible to use the drive as a mirror, or RAID 1 configuration. Sometimes the software included with the drive will allow you to do this, while other times you'll have to use third party software. If you're interested in doing this, check the manufacturer's website for RAID documentation prior to purchasing the hardware. The advantage to this method is that it's easy and you get real-time backups. The disadvantage is that the drive is constantly running and constantly attached to your computer.

The other mentality of external drive users (including myself) is to only attach the drive when backing up photos or other data. This method would require that some type of backup schedule be adhered to; otherwise your backups can quickly become out of date and nearly useless. The advantage of this method is that you can store your external drive separately from your computer in a safe or off-site location. The disadvantage is that your backups may not be completely up to date on any given day.

STRENGTHS

(⬡ *photo credit: d_vdm*)   **External drives are fairly cheap, reliable, and portable.** They don't cost much more than internal hard drives

and they can have about the same life expectancy (possibly better if not constantly plugged in). But the real benefit of an external drive is the fact that it can be removed from the computer and stored elsewhere. Storing the drive in a fireproof safe or in an off-site location can add an extra layer of security to your backup solution.

WEAKNESSES

(*photo credit: assbach*) **External hard drives are still hard drives and they're prone to the same failures as internal hard drives.** The disk may just give up one day without warning or reason. And if you decide to leave the drive connected to the computer at all times, it essentially has the same weaknesses as your computer (lightning strikes, fire, theft, etc.). External drives also tend to be a target for other failure modes, such as being dropped or knocked off the desk. Hard drives don't like that.

CONCLUSIONS

External hard drives can be great backup solutions and many people utilize them for doing just this. I, myself, use an external drive to store one copy of my photos and other vital documents. The great thing about them is that they can be truly separate from your computer between backups.

And as with any backup solution, I'd suggest keeping more than one. So an external backup drive is good, but it's not complete by itself. The next chapter will discuss the infamous RAID tower, including the Drobo.

See this chapter and reader comments online

7. RAID Tower

([See this chapter online](#)) This chapter deals with something that's a bit fuzzy to define — the RAID tower. It's similar to an external drive, but it can also be used as a working drive and/or a backup drive.

THE BASICS

(*photo credit: Lee Bennett*) A RAID tower is a collection of two or more internal hard drives housed in a box that contains special RAID (Redundant Array of Inexpensive or Independent Disks) hardware/software, and connects to your computer as if it were a single external hard drive. These towers can be utilized as a working drive or a backup drive, depending on your needs. In either case, the tower is designed to protect your data from hard drive failures (typically one disk can fail and you'll still be able to recover your data).

RAID towers come in various shapes and sizes, but the most common form is a cube-like enclosure that holds 4 hard drives. The towers that

hold 3 or more drives are capable of a RAID 5 configuration. Other towers may only hold 2 drives, and these are capable of a RAID 1 configuration. In either case, your data is protected against the failure of a single drive. The difference is that RAID 5 allows you to use more of your disk space (RAID 1 is just a mirror, so one whole drive is used for backup).

RAID towers have similar data connections to external hard drives (so I won't go over them again), but **some towers will have multiple connections to boost the data transfer rates.** Some will also have the ability to be networked via Ethernet.

One deviant of the typical RAID tower is the Drobo. Typical RAID setups require that all drives must be of the same capacity (or it considers all drives to be the same capacity as the smallest drive). The Drobo is a bit different in that it can utilize drives of various capacities, and you can upgrade your hardware as your photo collection grows.

BACKING UP

(photo credit: …-intherough-…)   **The nice thing about these towers is that they are intended to take care of the real-time backup for you.** If you're using it as a working drive, the RAID configuration will automatically backup your work as you go. If one of your hard drives in the tower decides to fail, you can simply replace the drive and the tower will rebuild your missing data.

If you decide to use the tower in a similar fashion to an external hard drive backup, you'll still need to find some software that duplicates your work from your working drive to the backup drive. But again, if one of the drives in the tower gives up, you can replace it easily without having to re-backup your entire working drive.

In either case, the stuff contained in the box has a layer of redundancy, but it's certainly not a solve-all solution. No single backup method can protect against every possible failure.

STRENGTHS

(photo credit: Bob.Fornal)   **RAID towers are easy and expandable.** The embedded hardware and software takes care of backing up your data, so you don't need to be as diligent about manually backing up photos. The other main perk of these towers is that you can upgrade the storage

capacity as your collection grows. Standard RAID 5 towers will require that all drives be of the same capacity, but a unit like the Drobo overcomes this limitation.

RAID towers are also somewhat portable and they can be accessible via a network. If you had to take one with you somewhere for some reason, you could do it. And hooking it up to your local network is a great way to ensure access to your photos from several computers around your home or office.

Some towers also have a really neat future, where if you have a second unit, you can configure the second one as an offsite backup of the first unit. (The QNAP TS-409 tower has this feature built in out of the box)

WEAKNESSES

(*photo credit: tantek*) **RAID towers are still basically an external drive, with a limited connection speed.** Most users will never notice this limitation, but it is a limitation nonetheless. The other downside to a tower is that you're only protecting against hard drive failures if you use it as a working drive. Fire, theft, and other major disasters can wipe out all your drives at once. And like external drives, you've got a box of hardware sitting on some desk or shelf just waiting to be knocked over.

CONCLUSIONS

If you can justify the cost of a RAID tower, they're certainly worth it. These devices add an extra layer of protection against common failure modes. I would, however, strongly suggest that if you decide to use a tower as your main working drive, to also use a secondary method of backup. Putting all your eggs in one basket is never a good idea.

I would suggest a RAID tower for folks with a considerable sized photo collection, maybe 500GB or more. Anything less than that, and you might as well just use a single drive for working and another single drive for backup. But as your collection grows into the terabytes, you'll need more than a single drive to work with.

See this chapter and reader comments online

8. DVD

([See this chapter online](#)) This chapter deals with a form of photo backup that people either love or hate: the DVD. When this article ran on the Epic Edits Weblog, there was a lot of discussion around the things said. This chapter has been slightly modified and the following chapter addresses further concerns expressed by the readers.

THE BASICS

(photo credit: Tony Austin) The DVD, or more specifically the Recordable DVD, is basically a plastic disc with some other stuff in/on it. DVD's are optical discs, so there are actual pits and bumps in the media (or variations in dye color) that make up the data (kinda like a record, but different). But regardless of their anatomy and inner workings, I think most of us are familiar with the DVD. To backup on DVD, you'll need a DVD recorder and the blank writable discs.

As technology advances, so do the formats and capacities of the DVD. The most common disc is the

single layer DVD with a capacity of 4.7GB. These discs come in various flavors, such as DVD-R, DVD+R, DVD-RW, DVD+RW, and DVD-RAM. There's really no difference between the - (dash) and the + (plus) variations, other than the fact that some recorders are built for one or the other (but there are also multi-format recorders out there). The RW indicator just means that the disc is rewritable, and it uses a different recording material than record-only discs. You can expect to find DVD-R and DVD+R discs for about $0.30 per disc when purchased in bulk. The RW discs might run around $0.75 per disc in bulk.

Then we have Dual Layer technology, with a capacity of 8.5GB. And again, we have the -R and +R variations. The downside to these discs is that they cost more money per GB. You can expect to pay about $0.90 per disc when purchased in bulk.

And now we have Blu-ray… the latest format for optical discs. These are way new in comparison to the older formats, so they're not widely used yet. But the capacity is quite amazing at 25GB for single layer discs and 50GB for dual layer discs. The major downside to Blu-ray is the cost. You can expect to pay about $10 per disc, and good luck finding them in bulk.

OK, so you have a lot of options. My point here is that you need to be aware of which hardware you already have (because most new computers come standard with a DVD recorder). Don't buy DVD+R if you have a DVD-R recorder — it won't work. And don't buy dual layer discs if you only have a single layer recorder — it won't work either.

BACKING UP

(☺ *photo credit: dawn m. armfield*) The whole idea behind using a DVD to backup is that it's cheap and permanent (well… sort of). They're cheap enough that you can recopy the data every 5 or 10 years to new discs and they're permanent enough that you don't have to worry (much) about erasing them by accident.

If you have a DVD recorder, you should also have some software that goes with it. **The backup process for DVDs is a bit more manual and labor-intensive than other methods we've discussed**, but it's not terrible. Most software now is just drag, drop, and hit a button.

If you decide to use DVDs to backup your photos, you'll have to decide when those backups will take place. Some photographers like to immediately backup to DVD after the photos hit the hard drive. Others, like myself, just do a DVD backup every week or every month. Either way is fine, just as long as you're fine with it.

Some photographers also like to use archival quality DVDs for backing up their photos. These can run about $2.50 per disc and they claim to be good for 100 years. Personally, I just use regular discs (but not the uber-cheap ones) and I write the recording date on them (along with the photos contained) — I figure I'll re-copy them to fresh discs every 5 or 10 years just to be safe. Plus, as capacities go up and prices come down, I can condense my DVD archive as the years go by.

STRENGTHS

(*photo credit: aeter*)   As I mentioned above, DVDs are cheap and (mostly) permanent. At $0.30 per single layer disc, you're paying about $.06 per GB. For a 500GB hard drive to be economically equivalent, you'd have to find one on sale for $32. So anybody who says they don't use DVDs because of the cost is full of it. You don't have to use the archival quality discs — regular ones are better than nothing at all. But if you want to invest in the expensive stuff, go for it.

And as I also mentioned above, the data recorded to a DVD (not a rewritable DVD though) is permanent. **You can't erase it by accident. You can't overwrite it by accident.** You simply burn it and stick it in a binder or a case and stow it away somewhere. I like to keep mine offsite — it's easy just to bring new discs to the location and add them to the stash. No back and forth business.

WEAKNESSES

(*photo credit: Dude Crush*) **The main downside to a DVD is how fragile they can be.** The discs are prone to scratches and dings that could ruin all the data (especially the really cheap no-name brands). It's best to not handle them any more than is necessary. Get a binder, throw them in the sleeves, and don't take them out unless you need them. Or put them in jewel cases and leave them on the shelf (though this adds considerable cost per disc). Along the same topic of fragility, DVDs will age and go bad after some number of years.

Another issue with the DVD is the capacity. Unless you have a large budget, you'll likely be using the old 4.7GB discs. You could potentially be splitting up a single photo shoot across multiple discs. If you're prone to taking a lot of photos like that, you might consider dual layer discs just for the convenience. And once you have a large collection of DVDs, they take up quite a bit of space in comparison to a hard drive (another reason I like the binders or books).

And the last weakness isn't so much with the DVD, but the person using the DVD backup method. **You have to remember to actually do it.** You can't rely on your fancy automated software to pick up a disc, put it in your computer, and make an up-to-date backup. You've got to have a schedule, and you've got to stick to it.

CONCLUSIONS

If you couldn't tell by now, I'm a fan of the DVD backup. **I would recommend this method to all photographers.** It makes for a great primary or secondary backup solution and its dirt cheap.

Sure, it's not as automated as some other methods and it can even be a little tedious, but burning a couple DVDs each week or month is certainly less stressful than losing all your photos in the event of a catastrophe.

See this chapter and reader comments online

9. DVD... Again

(See this chapter online) After posting the Photo Backup: DVD and Photo Backup on DVD: Love or Hate articles on the blog, we had a lot of reader comments and discussion about this medium. I realize many of the readers don't check on the comments section days or weeks after the article is published, so I wanted to follow up the two articles with some new thoughts and insights on DVD backups.

I would also encourage you to read through the comments in each of these articles. They are filled with stories on both sides of the line — users who have had nothing but problems with DVDs, and those who use them currently.

INTEGRITY OF DATA

The problem with any digital storage media is that it has a relatively short lifespan. Hard drives and DVDs alike won't last forever. DVDs seem to have a wide range of results when it comes to data integrity. You could potentially burn a disc and have the data be bad right from the start. Or you could burn a good copy and have the data go bad after a very short time (on the order of a year or two). You could also have discs that are 10 years old and still working fine.

The point is that you shouldn't expect DVDs (or any other storage media) to last forever. Construction, quality, materials, formats, process, handling, storage, and temperature all have an effect on the integrity of your data. I'll cover a few tips on ensuring good data at the end of this chapter.

DVD FORMAT WARS

Several people brought up some good points about the various DVD formats. I had stated that the "R" (record once) discs are best to use because they're inexpensive and you won't run the risk of overwriting data.

It turns out that "R" discs are less archival than other formats due to their construction. These "R" discs use an organic dye that reacts with the laser. The dye can break down over time and cause data to be lost.

The "RW" discs, on the other hand, use a metal alloy as the recording medium rather than an organic dye. The material is more robust and it gives the disc a better chance of retaining data over longer periods of time.

The "RAM" discs are also good candidates for archiving photos. Their construction is similar to the "RW" discs (metal alloy rather than a dye) and they have built-in error control and a defect management system (don't ask me how though).

TIPS FOR DVD BACKUPS

Regardless of which format you decide to use, there are a few things you can do to increase the life expectancy of your DVD backups.

BUY HIGH QUALITY DISCS

Like many things out there, you get what you pay for. Higher priced discs generally have better construction than the bargain discs. I personally use Sony discs, and I've never had a problem with them in over 5 years of use.

BURN AT LESS THAN FULL SPEED

I don't know if this one is myth or fact, but I've always burned at half of the fastest setting on the drive and/or media. I've heard that writing at super-speed can give you a poor burn, but I don't know how much truth there is to this. I typically use 8X for my DVDs even though my drive and discs are capable of 16X.

STORE DISCS PROPERLY

Once you burn the disc, put it away and leave it alone. Get a sleeve book or use jewel cases — you don't want your discs sliding around and getting scratched up. Also be sure to store them in a relatively cool dry place. Heat and humidity accelerate the aging process on most materials.

REPLACE OLDER DISCS

If you aren't using archive quality discs, you might consider replacing old ones after five years (which is why it's good to indicate the burn date on the disc). If you're really confident or if you want to risk it, you might be able to push it out to ten years. RW and RAM discs might last a bit longer, but I'd still replace these after around ten years. Regardless, it's a good idea to check on your older discs every few months to see if everything is still there.

DON'T USE AS YOUR ONLY BACKUP

No matter what you're using for a backup solution, only having one backup is risky. I would suggest to keep at least two backups, one of which should be off-site. I use DVDs as my secondary backup and I keep them off-site. My primary is an external hard drive that I keep in a fireproof safe on-site.

See this chapter and reader comments online

10. Online Services
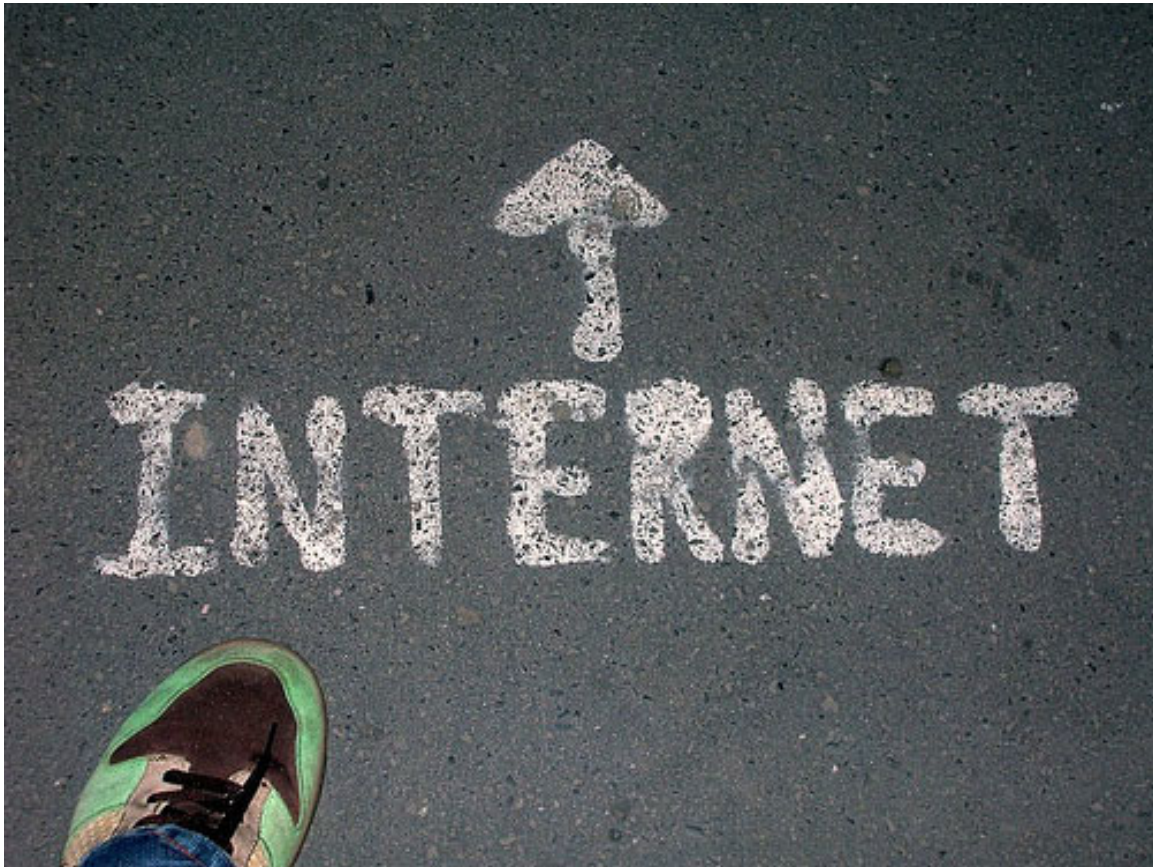
([See this chapter online](#)) To wrap up this sub-section of the eBook, we'll be talking about online backup solutions. I don't personally use any of these services, so I'll be relying on my knowledgeable audience to supplement this chapter with their comments on the blog article.

THE BASICS

(ⓒ *photo credit: f1rwb DClik*) **Online file hosting services** offer you the ability to upload your files (photos) to their system, while giving you the opportunity to download your stored files when needed. Some services are directly aimed at photographers, while others are more general and appeal to a wider audience.

What you're basically doing is placing your files on a hard drive connected to the web. You access that drive via a web interface (HTTP) or an FTP interface. These web-

connected hard drives are typically redundant, backed up, and distributed across multiple physical locations — so you shouldn't have to worry about the host losing your files if their affairs are in order.

Some services will also allow you to use their own software for interacting with your storage space — giving you more options and features than a standard FTP interface. And most of them have some sort of web interface that you can access from any computer connected to the Internet.

BACKING UP

Backing up to most online services is quite different than backing up to a local drive. Internet connection speeds are far slower than local connections, and this may play into your backup strategy. Money may also be a factor depending on the particular service you're using — some charge for both bandwidth and storage.

The specific procedure for backing up online will be determined by the hosting service. Some are completely manual, requiring you to choose files for upload and organize uploaded files as you see fit. Others might provide you with a piece of software that automatically monitors your archives for changes and uploads the files for you.

When choosing an online backup solution, you'll want to evaluate the service for several things: supported file formats, upload methods, download methods, security measures, data redundancy, sharing capabilities, bandwidth limits, storage limits, price, revision tracking, etc.

STRENGTHS

(photo credit: `◄ccdoh1►`) **The integrity** of an online backup is probably better than any local methods — if your chosen service is good about their own backups. If a natural disaster wipes out your house, your photos will be safely stored in some other location.

Another strength of the online backup is the **accessibility**. You can get to your photos from just about anywhere at anytime.

Some online backup or archive services offer **additional features** aimed specifically at photographers. You might be able to share your photos in a gallery or even sell your photos as prints or stock.

WEAKNESSES

(*photo credit: marcelgermain*) **I think the major weakness of the online backup solution has to do with Internet access.** Even the fastest Internet connections are way slower than anything right on your own computer. Plus, some Internet Service Providers will restrict your bandwidth usage, charge you extra for going over the limit, or throttle you down.

Other things you might have to worry about include the **security of your photos** (it is the Internet after all) and the long-term availability of your photos. I actually go hit by that last one — I signed up for a photo backup site and it ended up shutting down a few months after I got all my photos uploaded. I haven't gone back to an online backup since.

Oh yeah, and **these things cost money**. Most services will offer up a few GB for free, but larger accounts will cost money on a recurring basis. You'll have to evaluate if the ongoing cost is worth the extra protection.

CONCLUSIONS

Online backup solutions are still a bit sketchy in my mind. You can't know how long they'll be around for, and you're basically entrusting your important collection of photos to somebody else.

If you feel the need for an online backup, do some serious research first — don't rush into the first good looking offer. And if you're not sold on backing up all your files through an online service, a good alternative is to only backup your "good" photos online.

In the end, you have to balance the pros and cons of such services and decide if it's worth it. And, as with any backup method, **don't rely on just one method** — at least two different backups are recommended.

SERVICES

As I said, I don't use online backups. The sites and services listed below are some good places to start your research — I'm not recommending them in any way. Click at your own risk.

Amazon S3

Amazon offers a reasonable rate on storage space and upload bandwidth — plus you can bet they'll be around for a few more years.

PhotoShelter Personal Archive

Geared more toward photographers, they offer good options for print and license sales… though the price is a bit higher than most.

Mozy

These guys seem to have lasted through their infancy, and they have a decent looking backup solution — fancy desktop software for keeping track of things too.

IDrive

Another service along the same lines as Mozy.

Carbonite

Again, another service similar to Mozy and IDrive.

KoffeePhoto

A little more photo-centric, these guys have a community built around their service.

Zenfolio

Also aimed at photographers, Zenfolio gives you good options for displaying photos and selling prints.

SmugMug

Similar to Zenfolio, offering solutions strictly for photographers.

Flickr

Flickr may not be the first thing that comes to mind for photo backup, but a pro account gives you the ability to upload unlimited full-res images — plus the Flickr community is just awesome.

See this chapter and reader comments online

11. Software

photo credit: Nevin

([See this chapter online](#)) We've talked extensively about backup hardware, but that's just one part of a total backup solution. Software is important too — it allows you to manage multiple backup devices, schedules, and file revisions. Each software package offers different features, and each photographer had different requirements, so it's best to do your homework before choosing backup software.

THE BASICS

Backup software simply provides a means to duplicate data across multiple pieces of hardware. When dealing with thousands of files, this software is critical to keeping track of everything. Although the concept of duplicating data is simple, there are a number of more complex features included with most backup software.

The most important feature of backup software is its ability to perform incremental backups. This means that after the initial backup, subsequent backups only include new or modified files. Without this feature, each backup would take an excessive amount of time and disk space.

Another important feature of backup software is scheduled backups. Most of us have too many things to remember on a daily basis, so allowing the software to automatically backup your photos (or remind you to do so) is a major convenience.

Other features in backup software might include compression, encryption, remote access, synchronization, and more. Some backup software also allows you to keep multiple revisions of your data, allowing you to dig back to several file versions earlier.

BACKING UP

There's really not much to it once you get the hang of your software. Usually, you'll go through some kind of "wizard" with a series of dialog boxes. You tell the software which files/folders to backup, where to put the backup, how often, and any other options for compression, revision control, encryption, etc.

Some people like to backup once per week, once per day, etc. Others like to constantly keep their files synchronized. Either way is fine as long as you know the risks of each. Backing up at some time interval leaves gaps that are open to data loss — say you backup every Friday, you could have a failure on Thursday and lose nearly a weeks worth of work. On the other hand, constantly synchronizing your files takes care of these gaps, but it makes your backup hardware more vulnerable to failures such as lightning strikes, fire, and theft, as it is always connected to your computer.

Depending on the volume of new photos you produce, you should find it easy to set your frequency preferences. And if you do a big photo shoot, you can always run a one-time backup to ease your mind.

CONCLUSIONS

Like I mentioned already, when it comes to backing up your photos the software is important too. Without good backup software, you don't have a feasible means of utilizing your backup hardware. Find something that suits your needs, and keep the points I mentioned above in mind.

See this chapter and reader comments online

12. Strategy

photo credit: regolare

([See this chapter online](#)) Now it's time to put it all together and set a strategy. It's important to make a plan of attack when it comes to backing up photos, and this includes things like hardware choices, software choices, amount of redundancy, storage locations, schedule, and more.

REDUNDANCY

(🅭 *photo credit: estherase*) The first step in creating your backup strategy is deciding on the amount of redundancy you're comfortable with. More redundancy means more protection, but it also means more effort and expense. Less redundancy is easier to deal with, but you may be putting yourself at risk.

I would suggest a minimum of two complete and independent backups.
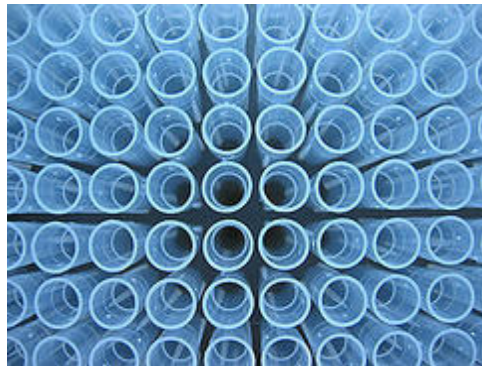
No matter what type of hardware you decide to use, you will greatly reduce the risk of data loss when you have 2 independent backups. The chances of losing the

originals and two additional backups are very slim. Going beyond the minimum of 2 will give you less risk, but with a diminishing return.

I have two backups myself: an external hard drive and DVDs.

LOCATION

(*photo credit: j / f / photos*) The next thing you need to think about is where your backups will be stored. Obviously, the easiest place to store them is in your home. This is fine, but it doesn't entirely protect against things like natural disasters or robbery. Storing your backups in multiple locations will also greatly reduce your risk of losing your photos.

I would suggest storing at least one of your two backups off-site.

Storing off-site can be done in a variety of methods. You could keep a backup at the home of a friend or relative. You could store a backup at your office. Or you could get a safe deposit box at your bank. For the backup you store at home, you can also guard yourself by keeping it in a fireproof safe — this will further reduce the risk of loss via fire or theft.

I keep my primary backup in a fireproof safe at my home and my secondary backup at my office.

HARDWARE

(*photo credit: nickwheeleroz*) You have all kinds of choices for backup hardware: internal hard drives, external hard drives, RAID towers, DVDs, and online services. Each has its pros and cons, so go back and familiarize yourself with them if necessary. What you choose will largely be a factor of personal preference, cost, and ease of use.

I would suggest using the best hardware you can afford.

Skimping on your backup hardware will only lead to problems and possible disaster. It's silly to spend hundreds of dollars on a new lens, but fret over a few bucks on that external hard drive.

My primary backup is an external hard drive and my secondary backup is a book of DVDs (which are kept off-site).

SOFTWARE

(photo credit: dorotea…)   Once you have your hardware picked out, you'll need some software to accommodate it. Most backup software will get you by, but some features and options will be exclusive to certain software packages. In the end, you have to be comfortable with the software because you'll be the one using it on a regular basis.

I use Norton Ghost as my backup software.

SCHEDULE

Now that you've got all the hardware and software picked out, it's time to decide on a backup schedule. Some people prefer to have real-time backups, while others are fine with daily, weekly, or monthly backups. It all depends on your volume of work and your comfort level with your backup status. If you decide to only backup once per month, you're at risk most of the time. Then again, if you backup on a daily basis, you may be spending more time dealing with backups than the actual photos.

I would suggest at least a weekly backup for your primary hardware.

You can also set different schedules for each of your backups. Your primary should be more accessible than your secondary, so you may consider updating that one more often. In the end, you have to balance time and effort with data security.

My primary is backed-up once per week and my secondary is backed-up once per month.

OTHER CONSIDERATIONS

In addition to the points above, you'll have to sort out a few other things on your own. You need to decide on a budget, for both money and time. Some options cost more than others, and some require more time and effort. You'll also need to think about the long-term stability of your backups. Hardware doesn't last forever, and no matter which options you choose you'll have to replace them at some point in time.

But regardless of how you decide to backup your photos, you should definitely back them up. Don't leave your photos open for disaster.

See this chapter and reader comments online

ABOUT THE AUTHOR

I'm the blogger behind the Epic Edits Weblog, creator of the Fine Art Photoblog, and a co-host of the PhotoNetCast. If you're looking for interesting reading material and an engaging community of top-notch photographers, I'd encourage you to visit the Epic Edits Weblog. If fine art is your thing, check out the Fine Art Photoblog for some amazing works by 9 talented artists from around the world. And if you'd like to hear discussions of current photography issues from 4 photographers with varying backgrounds, you've got to hear the PhotoNetCast.

Photography is my passion, and I make an effort to be involved with the community, online and offline. As a hobbyist photographer since 2003, I've learned a few lessons and I use my online outlets to share and discuss those lessons. With over 24 months of online publishing under my belt, I've learned that it's no easy task but the rewards are worth the efforts.

In addition to my own websites, I frequent the online photo sharing site Flickr. If you'd like to see my photographic works and connect with me via Flickr, my address is listed below.

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