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Back up Strategies

The exact method you use for backing up your computer and its data have varied over the years as the backup software and backup media have evolved. The reason for backing up has never changed and that is to preserve the information and system infrastructure of your business or home system so that you can recover from both minor and major data loss.

Part 1 – Backing up your Home System

For most home users, the data that you are trying to preserve are the digital memories in photographs, videos, and personal accounting data. You might have a lot of communication with family and friends in the form of saved emails, scanned documents you are keeping for archival purposes and maybe a library of movies and music. For some of us that can be an extreme amount of information that can far exceed what a normal business might have. For example, I have well over 150,000 digital photos and videos that I have taken over the past ten years. That amount of information is equal to about 750 gb's of storage. Most of the businesses that we deal with find that 500 gb storage system is overkill for them.

So what do you do as a home user to back up your precious photos and other information? You will want to have at least one copy of your data in a different location than your main data/computer location. But the industry rule of thumb is to have three copies of your data on three different media types. So if I were looking to backup up my system at home as described above, I would want to copy my data to multiple DVD disks as one backup, to a removable hard drive for the other copy that I could store off site, and/or use one of the many online storage services to store the information to the cloud using one of the many backup services that are available. If I did all three, that would give me my original copy on the computer, a backup on DVD, a backup on a removable hard drive and storage on the internet that could give me access to that data from any device that had internet connectivity. That would actually be four copies of my data and would be well past the optimum method of backup. I would feel real safe.

Cloud Backup and Storage Services

We recommend Carbonite to most of our customers for their home systems for their cloud backup service. Carbonite has several home plans that you can choose from so you will need to decide:

- 1) How much data do you need to back up?
- 2) Where the data is located?
- 3) How much do you want to spend?

We like Carbonite because it is simple, you can access your data from almost any internet source and

it is secure. Your data is encrypted before it leaves your computer and is kept in state-of-the-art centers that are guarded 24 hours a day, 7 days a week. Best of all, it is priced very competitively and once it is installed it is automatic.

Basic	Plus	Prime
\$59⁹⁹ per year/per computer	\$99⁹⁹ per year/per computer	\$149⁹⁹ per year/per computer
UNLIMITED CLOUD STORAGE SPACE for a home office or family computer WINDOWS / MAC	UNLIMITED CLOUD STORAGE SPACE for a home office or family computer WINDOWS	UNLIMITED CLOUD STORAGE SPACE for a home office or family computer WINDOWS
INCLUDES: <ul style="list-style-type: none"> ✓ Automatic cloud backup ✓ U.S.-based support, 7 days a week ✓ Sync, share and access files remotely with free apps 	INCLUDES: <ul style="list-style-type: none"> ✓ Automatic cloud backup ✓ U.S.-based support, 7 days a week ✓ Sync, share and access files remotely with free apps ✓ External hard-drive backup ✓ Mirror Image backup ? 	INCLUDES: <ul style="list-style-type: none"> ✓ Automatic cloud backup ✓ U.S.-based support, 7 days a week ✓ Sync, share and access files remotely with free apps ✓ External hard-drive backup ✓ Mirror Image backup ? ✓ Automatic video backup ✓ Courier recovery service ?

So let's take a look at how each plan works so that you get a better idea of which one to pick.

Personal Basic Plan: \$59.00 per year - If you have a normal computer setup at home where you have a single hard drive in your computer and no other hard drive source that you use to store your original copies of data, then the Basic Plan might be for you. You will get unlimited storage to the cloud, of all your chosen data files. What you don't get is automatic backup of any file that is over 4GB's in size or any video files. If you wish to backup these files, you can manually add them to your list of files to be backed up.

Personal Plus Plan: \$99.99 per year - Have you added a USB Drive to your computer to extend your active data storage? This would be a good reason to move to this plan. This plan also adds the ability to create a mirror of your primary drive to an external USB drive. This can provide an extra level of safety for your data and programs. It would make it much easier to restore your system in case of a catastrophic drive loss.

Personal Prime Plan: \$149.99 per year - This plan gives you everything that is in the **Personal Plus Plan** and adds an automatic backup of your video files and the option to have a copy of your backup shipped to you anywhere in the United States if you need it.

Pro Basic Plan: \$269.99 per year - If you are in a home that has a lot of computers that you would like to back up but not a lot of data (250gbs or less) then you might want to move into the Pro Basic Plan. Where is the breakeven point? If you have more than five devices (computers, external drives and NAS devices) than you might consider this plan. The personal plans do not backup NAS devices that might be on your network. The Personal Plus/Prime Plans will allow you to backup directly attached (USB) drives to the machine that is running Carbonite.

SmugMug Basic Plan: \$40.00 per year - You may also consider posting your photos to gallery sites to back them up but also to provide access to them for friends and family members. A service that I like is called SMUGMUG,

www.smugmug.com. This service provides a full photo gallery experience that allows you to store an unlimited number of photos (50mb file size or less) or videos (3 gb or 20 min or less in 1080p resolution or less). You can label the pictures to describe what is in them, put a description on each gallery folder to describe the whole group of images

in that gallery. If you picture it as a studio display it will make it easier to understand the concept of going into a room (gallery) and then looking at the pictures on the wall. You can allow the pictures to be downloaded and if you need to get your pictures back from the site you can request a disk to be sent with all the images on it. There are other levels you can buy into on this site that allow for greater display flexibility as well as commercial functions that you can setup to sell your pictures if you are so inclined. Because it is a paid service, the likelihood of it disappearing from the scene is very unlikely while you have no idea what could happen to your pictures at places like Facebook, Flickr, Google Drive and DropBox, to name a few.

DropBox: Free for limited version Paid if you want more - For important file storage that is automatically linked between machines DropBox has been one of my favorites for a long time because it integrates with so many applications no matter what tablet or pc I use. It has made it so easy for so many years that I have a hard time giving it up, but I have started the move to using OneDrive from Microsoft for many things instead. www.dropbox.com

Plans at a Glance



BASIC	POWER	PORTFOLIO	BUSINESS
\$40/year	\$60/year	\$150/year	\$300/year

Choose your Dropbox plan

Basic
Free

Store your stuff in Dropbox and securely access your files from anywhere. Refer friends to get more space.

Get started

Pro
From \$9.99 a month

Great for personal projects, with enough space for all your docs, files, and over 20,000 photos.

Upgrade to Pro

Business
For 5+ users

Get as much space as you need, with powerful admin features and unlimited version history.

Learn more

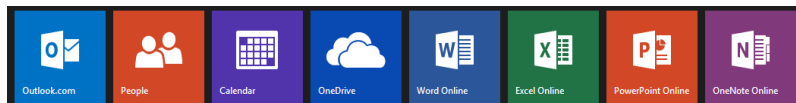
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OneDrive: Free - However, with the strong push of Office365 and Microsoft's new Office 2013 products, Microsoft's OneDrive is slowly becoming my Cloud sharing storage. I spend most of my day inside Office programs doing one thing or another so it is important to me that something integrates well and allows me to easily share files.

If you sign up through www.outlook.com then you have access to email, calendar, online versions of Word, Excel, PowerPoint and OneNote and about 5gbs of storage on OneDrive. www.onedrive.com



Google Drive: Free and an upgraded paid Service – Primarily a Google Chrome and Android product I don't find this product particularly useful to me, however, if you are an avid Google Docs user this service might be perfect for you. They also have a downloadable app that adds the Google Drive to your system as another folder. The [paid business subscription](#) has just increased its storage plan to unlimited storage for companies that have more than 5 users but in a home environment you are probably not going to go this direction. www.googledrive.com

Local Backup

There are several methods you can employ for local backup if you don't want to use Internet storage services. In the long run they are typically less expensive but they also rely on you to ensure that the backups occur. You can use backup applications like Window Backup to make a copy of your information to another location like a USB drive.

Most *USB Hard Drive* products come with some sort of backup program loaded on to the disk drive to help you automate your backups. This can be very helpful because forgetfulness and laziness are two biggest culprits in data loss. That is one of the reasons we recommend a backup service like Carbonite.

In most cases you will probably only be backing up your data directory. If you are using a personal accounting system like Quicken you will need to know where it is stored so that you include it in your backup as well. I normally put all my data into my profile documents directory so that I only have to worry about backing up the one directory location.

You will want to rotate your backup drives and take one to another safe location so that all your data isn't in one location. Take a copy to work, to your parent's house or swap with a close friend or relative. The hardest thing will be to make it routine to swap them out so that you always have a current copy off site.

Flash Drives or *USB Sticks* are another medium you can store to which are light and small, so they are easily transported. Be careful that they are not your only form of storage because they can be easily damaged and it is very costly to use a service to retrieve the information if it can be retrieved. Because they are small they are also easy to misplace so be careful of this as well.

Part 2 – Backing up your Office System/Network

We need to talk several different scenarios to be able to encompass our thinking about data backup in different kinds of office environments. The two different types of network designs are a peer-to-peer environment vs. domain server network.

Peer-to-Peer (P2P)

P2P – No Central Storage - The most basic design of a P2P network is where there is no central data storage. Each individual's data is stored on each individual's workstation. In this environment, you share files by emailing them to the person that you want to share the file with. The biggest problem in this network design is that there could be multiple copies of the same file floating around in different revision states. You can see the obvious confusion that could occur because of this, and that is one of the prime reasons for switching to a central storage network design for all the office files.

P2P – With Central Shared Storage – In a network design with a designated central shared storage location, the location of that storage area can be either on a workstation being used by user, a dedicated PC that acts as a pseudo server, or a Network Attached Storage (NAS) device that houses all the shared files.

P2P: Carbonite Pro Packages

In a situation where the user is responsible for backing up the data on their workstation, it is paramount that you put in place an automated backup system. If you don't, systematic backups will not get done.

Generally, people are forgetful and life just gets in the way of things. So you want to take the

responsibility of the individual remembering to do the backup out of their hands to make sure it gets completed. Using a product like **Carbonite Pro Basic (\$269.99)** gives you the ability to back up an unlimited number of workstations but this service has a cap on the total amount of storage capacity. You will need to consider this cap when sizing up your total data storage requirements. The initial package starts with 250 gb's and each 100 gb extra costs \$99.99.

Basic	Plus	Prime
\$269⁹⁹ per year	\$499⁹⁹ per year	\$599⁹⁹ per year
CLOUD STORAGE SPACE 250 GB Additional storage available	CLOUD STORAGE SPACE 250 GB Additional storage available	CLOUD STORAGE SPACE 500 GB Additional storage available
To share between an unlimited number of:	To share between an unlimited number of:	To share between an unlimited number of:
<ul style="list-style-type: none"> ✓ Computers ✓ External Hard Drives ✓ NAS devices 	<ul style="list-style-type: none"> ✓ Computers ✓ External Hard Drives ✓ NAS devices ✓ Windows file servers ⓘ 	<ul style="list-style-type: none"> ✓ Computers ✓ External Hard Drives ✓ NAS devices ✓ Windows file servers ⓘ

The Carbonite Pro Basic Plan also works well when you have multiple branch offices or people working out of home offices.

With Carbonite Pro Basic, for one price,

you are able to back up all of your office's workstations. If your total number of workstations is less than six, then it would be more cost effective to purchase multiple licenses of the Personal Basic Package for backup. However, if you need HIPAA compliancy, you will need to stick with the Pro Group of Services.

<http://www.carbonite.com/backup/pricing-plans/business-plans>

If your business has...	CARBONITE	MozyPro	CrashPlan PRO	SOS Online Backup	Symantec Backup Exec.cloud	Acronis Backup & Recovery Online	Dropbox for Business
5 computers Total of 100 CB	\$269 ⁹⁹	\$439 ⁹⁹	\$349 ⁹⁹	\$999 ⁹⁹	\$450 ⁰⁰	\$495 ⁰⁰	\$795 ⁰⁰
10 computers Total of 250 CB	\$269 ⁹⁹	\$1,045 ⁰⁰	\$799 ⁹⁹	\$999 ⁹⁹	\$1,068 ⁰⁰	\$990 ⁰⁰	\$1,420 ⁰⁰
10 computers & 2 file servers Total of 250 CB	\$499 ⁹⁹	\$1,220 ⁰⁰	\$799 ⁹⁹	\$999 ⁹⁹	\$1,068 ⁰⁰	\$2,488 ⁰⁰	*
15 computers Total of 500 CB	\$599 ⁹⁹	\$2,309 ⁰⁰	\$1,499 ⁹⁹	\$1,699 ⁹⁹	\$2,025 ⁰⁰	\$2,983 ⁰⁰	*

* Does not support file servers

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Domain Based Servers

This next group of servers gives your office network more security, controlled access to programs and data, faster access to large databases and centralized storage of data. In general networks based on this infrastructure allow for better control of security and access, less issues with malware, viruses, Trojans and general system attacks when combined with a good firewall device and anti-malware software. We look at several things when designing a backup solution for this kind of network. You might need to take a hybrid approach where you need to use multiple services to have a comprehensive plan or you may want to make it as simple and cost effective as possible. Again, many factors weigh in to making the right decision on the type of backup system you will want to implement. This is why we offer a number of basic packages for you to choose from.

Tandberg RDX Removable Cartridge System

The RDX QuikStor media-based removable storage system offers rugged, reliable and convenient storage for backup, archive, data interchange and disaster recovery. It provides enterprise performance and fast access, with transfer rates of up to 650GB/hr and capacities from 500GB up to 2TB per cartridge. This product is a perfect fit for small offices with a single server that are cost restrictive. There is no cost in maintaining this strategy after the initial purchase unless you purchase additional data storage cartridges.

The system comes with AccuGuard Software that is a powerful data protection software that delivers reliable, automated backup and recovery utilizing a data deduplication engine designed to increase effective storage capacity. AccuGuard increases effective data storage by providing 20:1 deduplication, intelligently optimizing the data at the source which results in drastically improved backup windows and network bandwidth. Data retrieval is simple and painless with AccuGuard's flexible file searching, drag-and-drop recovery and point-in-time restore.

Benefits

- Vast capacities: 320GB, 500GB, 1TB, 1.5TB or 2TB of hard disk capacity or 64GB, 128GB, 256GB or 512GB of solid-state disk capacity on one piece of media.
- Fast access: Blistering disk-based speed and access provides up to 46 MB/s with SATA or 180 MB/s with SuperSpeed USB
- Windows-Backup support
- Interface: SATA or USB 3.0 high speed
- Greater than a 10-year archive life
- Shock-proof design: Ruggedized media
- Cost-effective solution that suits all sectors from SOHO to departmental users
- Full backward and forward compatibility
- 3-year warranty: Advanced Replacement Service
- Encryption capable

This system requires manual replacement of cartridges. We suggest that you use multiple cartridges in rotation that you take offsite for the best data protection. The main downfall of this type of system is that you need to remember to manually do the rotation of the cartridges and sending and retrieving the cartridges from their offsite location.

How do you determine the number of cartridges that you need? The answer to that is how much risk you do want to stand? We suggest a minimum of a three cartridge solution but either a seven or nine is much better. In a three cartridge scenario, depending how often you change the cartridges, you can go back up to 3 days if you are changing the cartridges and backing up every day.

In the seven and eight drive rotation shown in the tables below, you have up to five day to day images that you can restore from and up to 3 weeks for periodic images to restore from.

In the nine drive scenario shown in the table below, you have the same day to day backup images to restore from but you also have four week end images and one eight week image to restore from. We have also had clients that purchase two extra drives for month end backups that they run before their accounting

7 Drive Rotation – Based on a (5) day								
Week 1	1	2	3	4	5	X	X	
Week 2	1	2	3	4	6	X	X	
Week 3	1	2	3	4	7	X	X	
Week 4	1	2	3	4	5	X	X	

8 Drive Rotation – Based on a (6) day								
Week 1	1	2	3	4	5	6	X	
Week 2	1	2	3	4	5	7	X	
Week 3	1	2	3	4	5	8	X	
Week 4	1	2	3	4	5	6	X	

system end of month is closed as well as another set of two cartridges for after the closing is completed to provide a starting point for the new month.

Again, the design is based on what your situation requires and what best suits your needs. The benefits of this cartridge based system is that it is very cost effective and is an image backup of the system. You can do a full metal restore of your server as well as restoring individual files. The CONS of this system include: single backup source, does not support incremental backup or multi-location backups, remote monitoring and server virtualization.

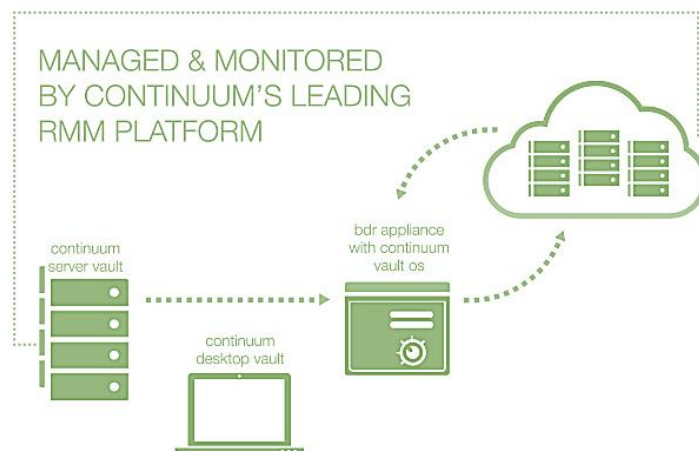
9 Drive Rotation – Based on a (5) day work week								
Week 1	1	2	3	4	5	X	X	
Week 2	1	2	3	4	6	X	X	
Week 3	1	2	3	4	7	X	X	
Week 4	1	2	3	4	8	X	X	
Week 5	1	2	3	4	5	X	X	
Week 6	1	2	3	4	6	X	X	
Week 7	1	2	3	4	7	X	X	
Week 8	1	2	3	4	9	X	X	
Week 9	1	2	3	4	5	X	X	
Week 10	1	2	3	4	6	X	X	
Week 11	1	2	3	4	7	X	X	
Week 12	1	2	3	4	8	X	X	
Week 13	1	2	3	4	5	X	X	

Gemini 3 Backup Solution

This is our most comprehensive backup solution. It provides both local and offsite backup continuous images of your server. The backup software that is part of the service package includes data integrity checks, 256-bit encryption, granular backup scheduling and data retention, and automated screenshot verifications of backups. The images are natively stored in virtual format which makes them instantly bootable with no conversion process necessary. If necessary the images can be exported to VMWare or Hyper-V.

We offer true business continuity: a holistic bundle featuring backup and recovery software and our award-winning remote monitoring and management platform - all supported by a 24x7x365 Network Operations Center.

This package is priced at \$166.66/month (when billed to a **Priority Discounted Service Contract**) and includes our local vault storage server, backup software, offsite backup, monitoring service, reporting service, and all maintenance included in the price. Each additional server added to the service costs \$100.00/month more. It is simple, straight forward, provides both local and cloud backup, and is hands free! You don't have to do a thing. The Gemini 3 Backup Solution does it all for you.



If your server has a failure, within minutes we can spin up the backup server to provide you with a temporary server until your primary server is restored to operation. If you have a catastrophic disaster at your site and the server and the backup server are not available then the online backup image can be spun up and mounted so that it can become your server virtually from the Internet. Once your server is back online, it can be restored with all the new changes from the virtual server. This is our most comprehensive disaster recovery and backup system that we have.

Limitations: The biggest limitation of this system for offsite backup is the amount of data that you need to push offsite and the bandwidth limitation of your Internet connection. These two things may make this product unusable for offsite backup. It could still be used as a local backup solution device but you will lose that offsite capability from the system.

While the Gemini 3 Backup Solution can be used with virtualized servers you may want to consider another option.

VEEAM + ioSafe Backup Solution

If your server environment becomes very complex, with many servers and large amounts of storage, we need to come up with a better solution design for you. While it is optimum to back up your servers to an offsite location that is not always possible because of the amount of data that you are pushing to the offsite location. So we need a solution that can be kept onsite and provide a safe destination for your backup data.

If you are in a virtualized environment *Veeam Backup & Replication software* provides fast, flexible and reliable recovery of virtualized applications and data. It unifies backup and replication in a single solution, increases the value of backup and reinvents data protection for VMware vSphere and Microsoft Hyper-V virtual environments.



The ioSafe 214 is a Fire and Waterproof NAS/RAID Storage Solution. We install this unit on your network and point the Veeam software to it to store your files. The ioSafe 214 is Fireproof, Waterproof, has Redundant Hard Drives, Theft proof and includes a Data Recovery Service for five years. The ioSafe 214 protects against data loss in fire up to 1550°F, 1/2 hour Per ASTM E119. Protects data from flood, full submersion, 10' depth, and 72 hours, fresh or salt water. Built in Kensington security slot. Optional floor mount / padlock kit. You can hide it anywhere in the building on the local network. And finally provides a data recovery service with up to \$5000 per TB of forensic data recovery.

We typically deploy these units in as a 4TB dual drive unit with the five year forensic warranty. It is a great product that provides a wonderful solution to the situation of not being able to store your data offsite.