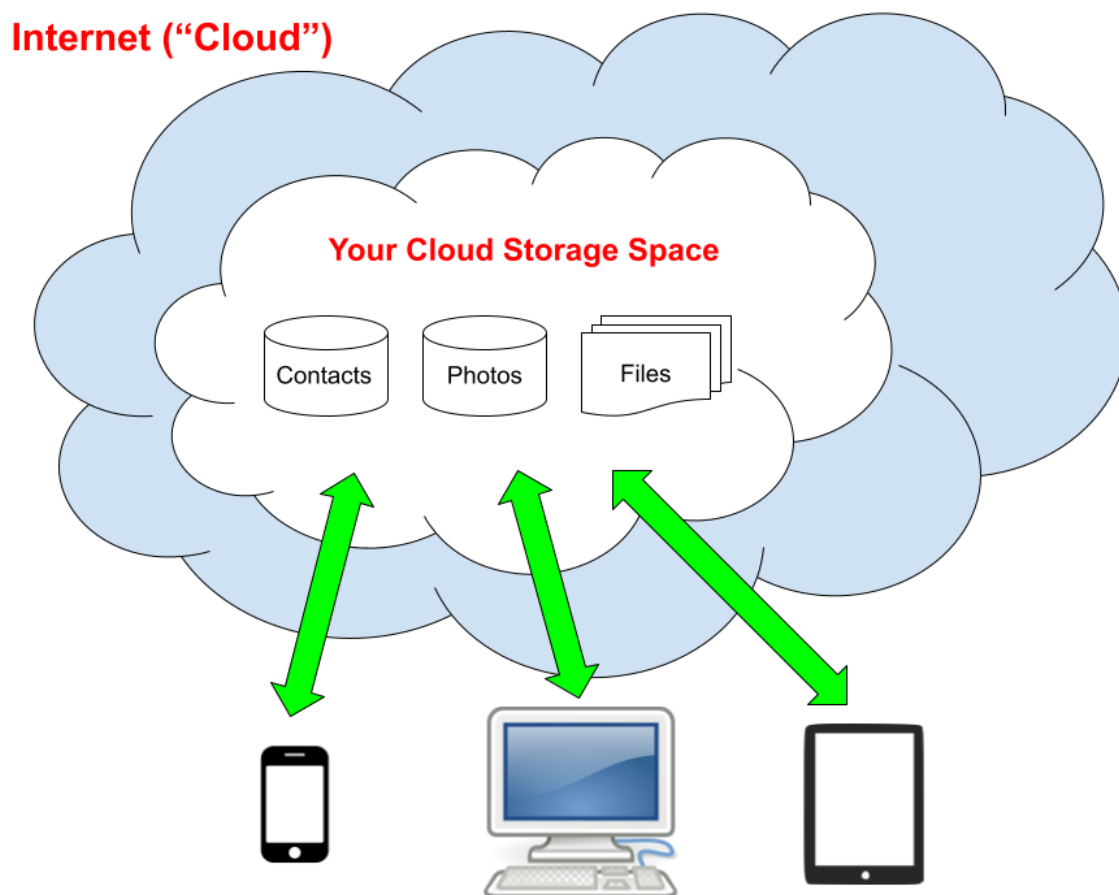


Cloud Storage

The Internet, commonly called “The Cloud” can be used for many things. It is a vast network of billions of computers and other devices which can communicate with each other.

You can set up your own “Cloud Storage” area for your information which can then be accessed by all of your devices:



There are many companies that offer this service. The most common ones are Google (“Google Drive”), Apple (“iCloud”), Microsoft (“One Drive”), Dropbox and Box, but there are many others.

Cloud Storage can be used for many things. Some common uses are:

- Cloud Backup
 - Backing up the data on your computer or other device
 - Saves data from your computer to the cloud
 - Is used to recover from catastrophes (theft or hardware problems)
 - Provides multiple versions or recovery points for your data

- Cloud Data Storage
 - Remote storage for your data on the Internet
 - Looks like an external drive to your computer
 - Saves the data in your Cloud space
 - Can often be accessed through a browser interface
 - Does not support versions of your data, only the current data

- Cloud Syncing
 - Storing your data on your Cloud space
 - Automatically synchronizing the data with multiple devices
 - Changes made anywhere are reflected everywhere
 - Data can be accessed anywhere you have an Internet connection to your device
 - Local versions are kept on the devices if the Internet is not available

- Sharing Data With Other Users
 - Sharing specified files or folders with other users
 - You can often control whether the other user can make changes to the data
 - Supported by all the Google web apps like Docs, Sheets, Slides, Drawings, etc. for Google Drive cloud storage
 - Many other apps like Microsoft 365 also support sharing

Backing Up Your Data

Computers can be backed up using an external disk which is physically attached to the computer with a cable. You can also back up your computer on the Internet with a vendor that provides this service.

Backup software copies the latest version of the data and creates a “restore point” which is a point in time that the data can be restored to.

Data backup is done to allow you to recover from a disaster, either a hardware or software problem that keeps you from accessing your data. A common example is a failure of the internal disk on your computer or other device. Backups are also used to recover from computer viruses that take over your computer and hold it for ransom.

Backups are normally done automatically on a scheduled basis by backup software. Any data that has changed is copied to the backup device. It is normally possible to view how the data has changed over time and recover the data to any restore point.

You can also back up your data to the Cloud using a Cloud backup service. This can be done either in addition to local backup or instead of doing local backup. It is a good idea to do both.

If necessary, you can restore your device to how it looked at a previous backup time. This is how Apple iCloud backup works for iPhones and iPads. These backups can be used to set up a new device or restore the existing device that was backed up.

Cloud Data Storage

Another way of using Cloud Storage is as a remote disk for your device. Instead of having data on an external drive attached to your computer or other device, you can keep data on a Cloud based folder which looks exactly like an external drive attached physically to your machine.

This is how Apple iCloud works on the Mac, Microsoft OneDrive, Google Drive and Dropbox work on PC and Mac computers. The Cloud storage contains the latest version of the data and if you want to keep earlier versions this can be done by keeping copies of the data files or using a software versioning system

When you change the data locally it is automatically copied to the Cloud Storage version, so the data exists both locally and remotely. The local and remote data are automatically synchronized as long as the device is connected to the Internet.

If changes are made on the device and the Internet is not connected, the changes will be “synced” or copied to the remote storage automatically as soon as the device reconnects to the Internet.

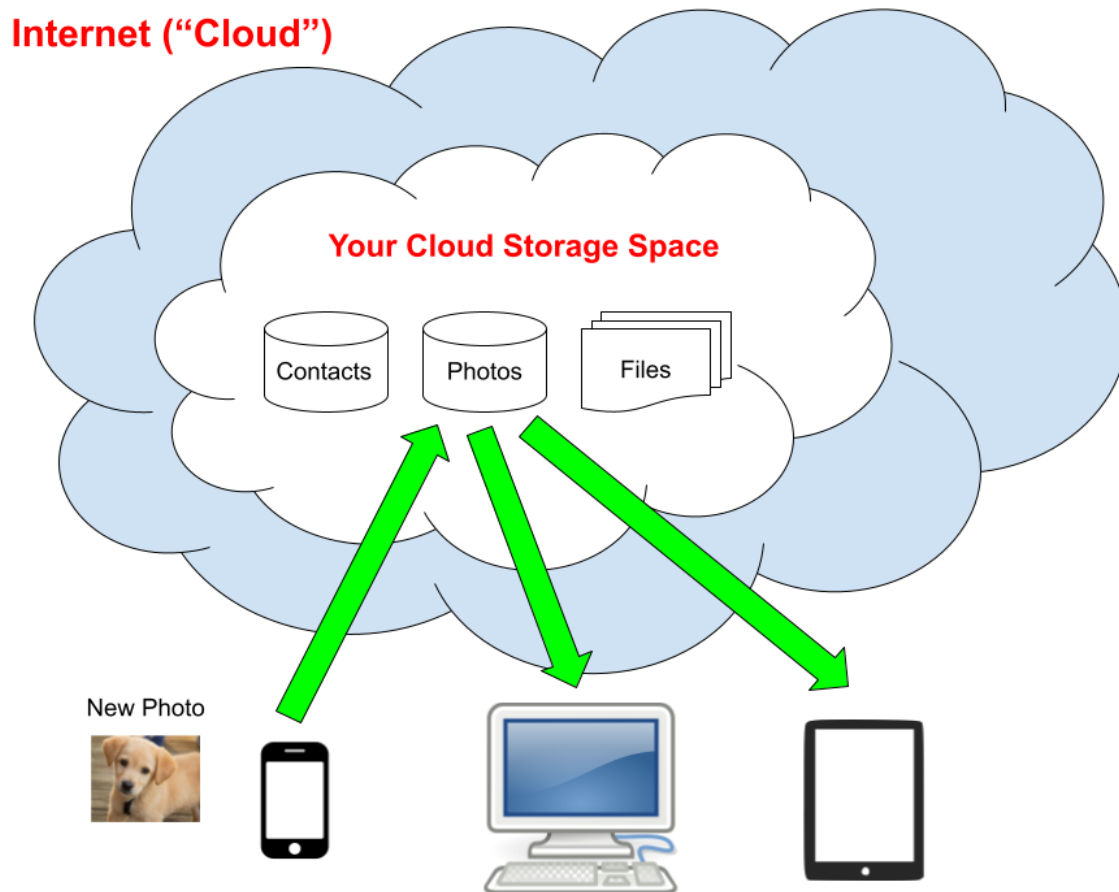
Most of the Cloud Storage vendors also support viewing your data on any device using a web browser page. This can be very handy if you do not have one of your devices readily available.

You can, for example, show your pictures from Apple or Google Photos on a friend’s computer by using a browser and logging into the Apple (icloud.com) or Google (drive.google.com) website.

Sharing Data Between Your Devices

This approach to Internet computing lets your devices share your data through your personal cloud storage space.

You can change your data on one device, e.g. add a new photo, and will almost instantly appear on all of your connected devices.

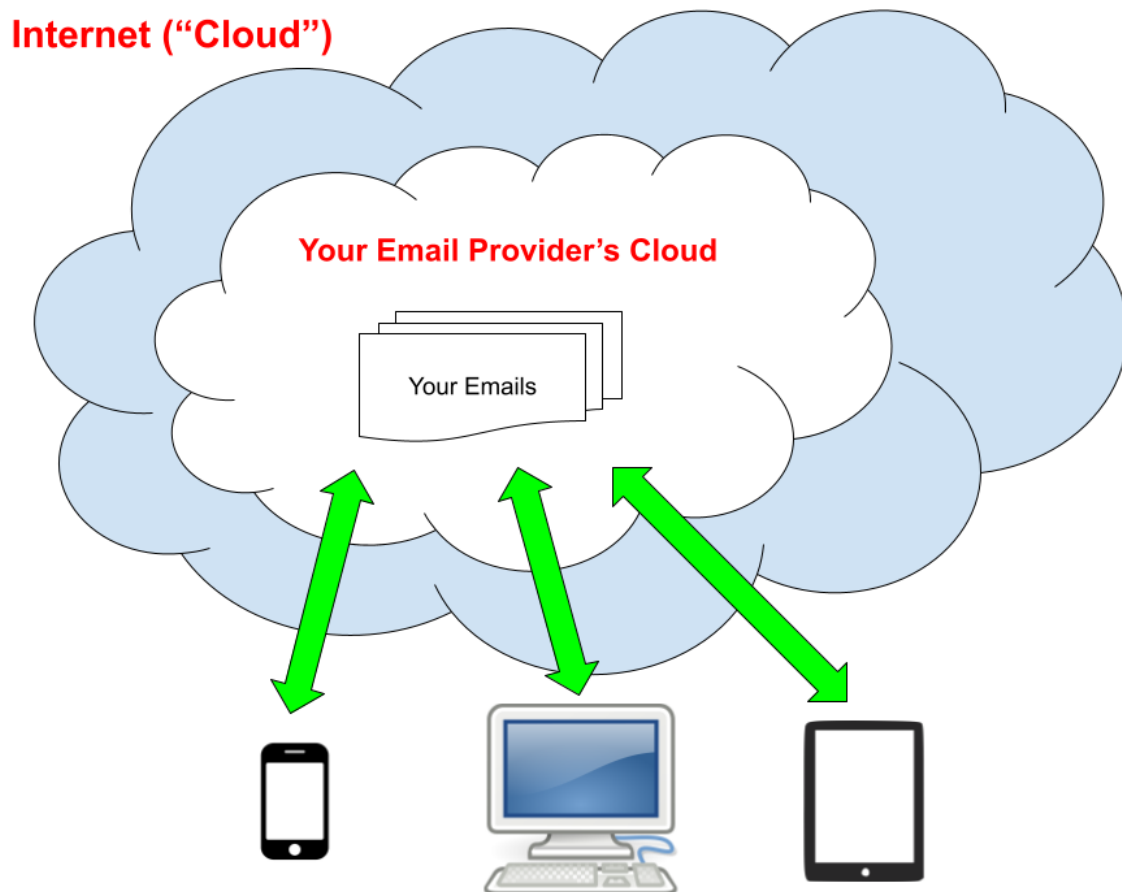


You take a picture on your smartphone and it is automatically copied to your photo library in the Cloud and will shortly appear on all of your devices.

This is done through a process called “synchronization”. The master copy of the information is on the Cloud and all of your devices synchronize or make sure they have the same information.

We are all used to this idea for email. You sign up for an account with an email provider like Google (@gmail.com), Yahoo (@yahoo.com), Apple (@cloud.com), Microsoft (@msn.com), etc.

When you use your email app on your device view your email in a web browser you are really viewing email data on the Cloud:



If you delete an email message on one device, it will disappear from all of them (or get moved to a Trash folder). If you send a new message on one device it will appear in a Sent folder on all of your devices.

You can have Cloud Storage accounts with several vendors and get personal Cloud Storage space on all of them. For example, I use Google Drive for documents like this one and the Apple iCloud for my Mac, iPhone and iPad devices.

Some cloud storage vendors like Google and Apple allow you to store other types of information like email, contacts, reminders, music, photos and videos on your cloud space and then access them on any of your devices.

For example, if you use Apple Photos on your iPhone and set it up to transfer the photos to iCloud, they will appear in the Photos app on all your Apple devices. If you edit them on one device the change will appear on all of them. If I add a contact on my Mac, it will appear seconds later on my iPhone and iPad.

The Google Photos, Contacts and other apps work the same way. We are used to this idea for email but it may seem new for other types of information. When you view photos in the Mac Photos app, you are really viewing your photo library on your iCloud. The same is true for Google Photos.

If you delete a photo on any of the Apple Photo apps, the photo is deleted on your iCloud and removed from all your devices. Google Photos is similar but lets you delete photos on one device and keep them in your Google photos library on the Internet. This is more powerful but can be confusing to some users.

If you store files on the Apple iCloud, they will appear in an “iCloud Drive” on your Mac and you can also access them with the “Files” app on your

iPhone or iPad. Google Drive works the same way. You can access the files in a browser on your PC or using a “Drive” app on your portable devices. Many vendors like Google and Dropbox provide computer software that make your Cloud Storage appear as a folder on your computer.

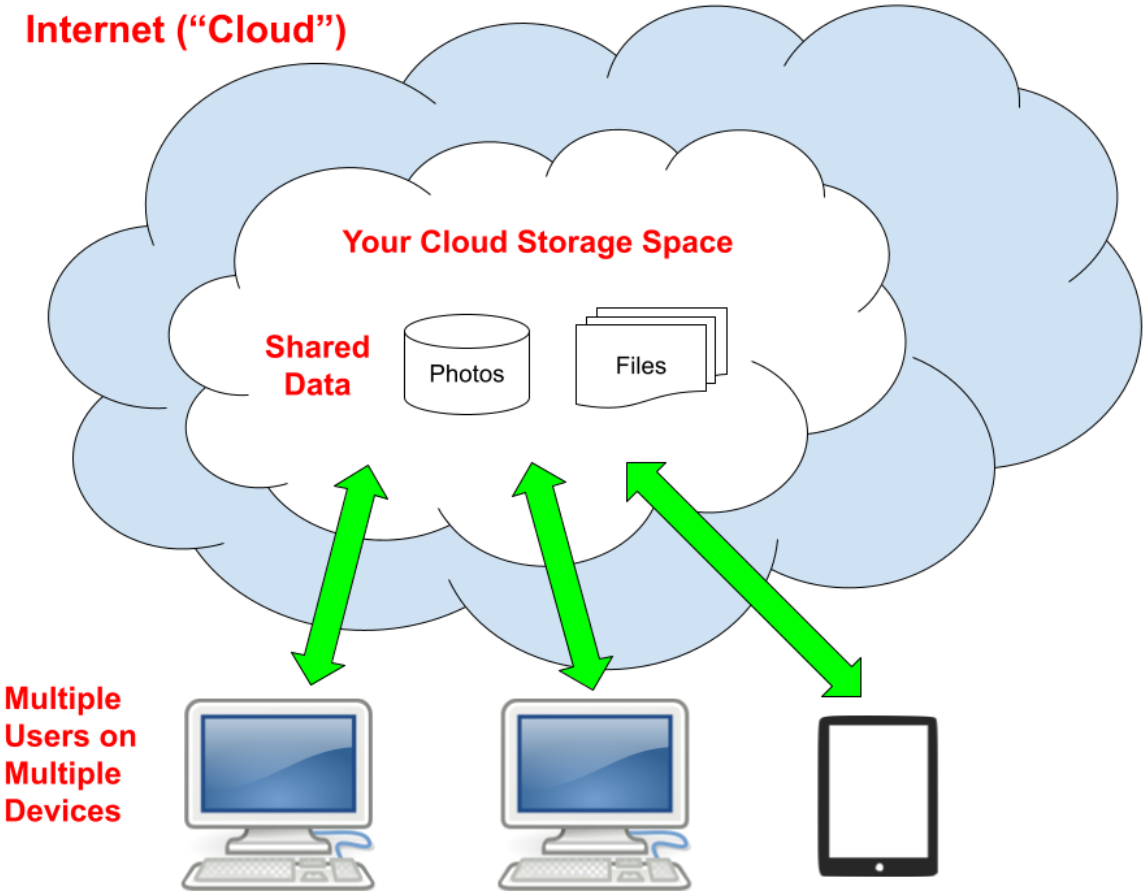
Sharing Cloud Data With Other Users

Most of the Cloud Storage vendors let you share data with other users. Google does this through shared Google Drive folders and application files (e.g. Docs Sheets, Slides, etc.). Apple supports shared iCloud folders and shared Photos albums. Microsoft OneDrive supports sharing folders and files with other users. Dropbox and other cloud storage vendors all support both folder and file sharing with other users.

When you share a folder or file with another user, you specify whether the other user can only view the data or whether they can edit it and make changes.

The Google web apps like Google Docs take this to another level by letting multiple users edit the same data at the same time. This lets you collaborate with other other editors in “real time”. Everyone will be able to see the changes from other users right after they make them. The Microsoft 365 apps (like Word, Excel and Powerpoint) also work the same way.

This would conceptually look similar to the earlier pictures but in this case you have shared data on your Cloud Storage that can be accessed by multiple users on multiple devices:



Cloud Storage Vendors and Prices

There are many Cloud Storage vendors. Most offer a small amount of cloud storage space for free and then charge subscriptions for large amounts of data:

Vendor	Product	Free Space	Subscriptions (USA)
Google	Drive	15 Gb	100 Gb - \$1.99 / month 200 Gb - \$2.99 / month 2 Tb - \$9.99 / month
Apple	iCloud	5 Gb	50 Gb - \$0.99 / month 200 Gb - \$2.99 / month 2 Tb - \$9.99 / month
Microsoft	OneDrive	5 Gb	100 Gb - \$1.99 / month 1 Tb - \$6.99 / month 6 TB - \$9.99 / month (1 Tb per person)
Dropbox	Dropbox	2 Gb	2 Tb - \$9.99 / month 3 Tb - \$16.99 / month
Box	Box	10 Gb	100 Gb - \$5 / month Unlimited - \$15 / month
iDrive	iDrive	5 Gb	5 Tb - \$69.50 / year

Google was offering unlimited photo storage for compressed photos but this is changing later this year. Any photos uploaded after June 1 will count toward your maximum Google Drive storage space.

References

Difference Between Cloud Syncing, Cloud Storage and Cloud Backup

<https://www.fissionlabs.com/understanding-the-key-difference-between-cloud-syncing-cloud-storage-and-cloud-backup/>

Google Pricing

<https://one.google.com/about/plans>

Apple Pricing

<https://support.apple.com/en-us/HT201238>

Microsoft OneDrive Pricing

<https://www.microsoft.com/en-us/microsoft-365/onedrive/compare-onedrive-plans?activetab=tab%3aprimar1>

DropBox Pricing

<https://www.dropbox.com/individual>

Box Pricing

<https://www.box.com/pricing>