Organizing Your Data

Introduction

Computers and portable devices deal with lots of different kinds of data. In the old days things were more obvious. Your audio was on records or CDs. Your books were on your bookshelf and your movies were on VCR tapes.

These days much of your data (information) is stored on your computer or portable device. It can be hard to understand the different kinds of data and how they are stored and organized. It is important to understand the basics in this area in order to easily use your computer devices.

Types of Data

There are many different types of data stored on a computer or portable device. Some of the more common ones are:

- Email
- Contacts
- Photos
- Videos
- Word Processing Documents
- Spreadsheets
- Presentations
- Executable (programs, apps)
- Program data (e.g. settings)

Each of these types of information can be stored and organized on a computer or portable device in different ways. This can make the overall system seem very confusing.

Files and Folders

Your computer data may be stored in files. These are individual chunks of data that have a name, file type and location. Files are organized in a hierarchy of folders.

A folder is a way of organizing files. Each folder can contain files and other folders. The main disk drive in the computer acts as the top level folder. The whole system looks like a tree.

On a Mac, this can look something like this:
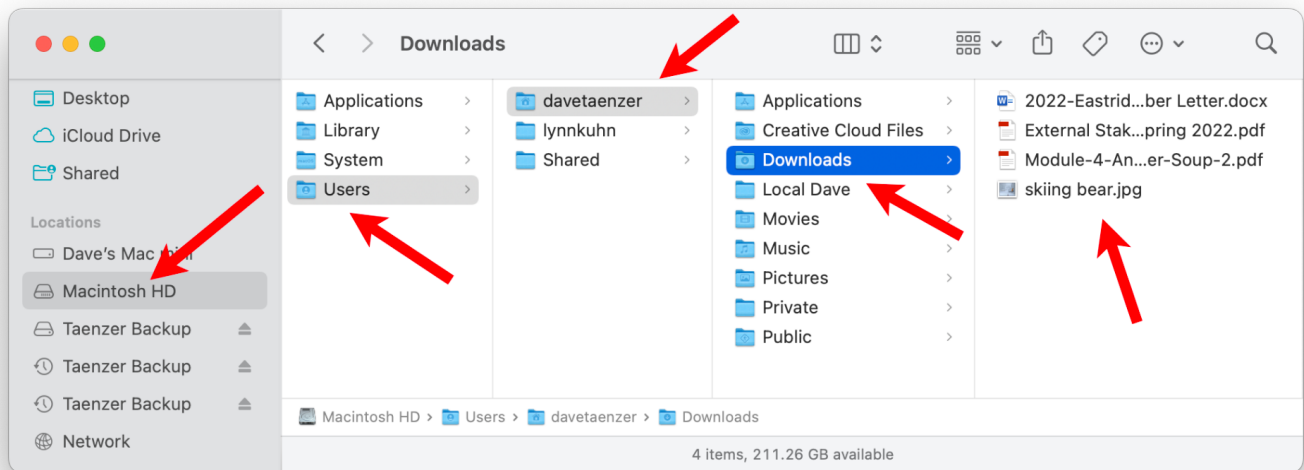
The internal disk drive in the Mac (called "Macintosh HD" in this case) has several folders including "Users" which has a subfolder for each user's information. In this case the "davetaenzer" folder has several subfolders including one called "Downloads" that contains files I have downloaded from the Internet with the Apple Safari browser.

There can be any number of levels of folders and subfolders.

Files on computers use the file name to determine the type of data stored in it. This is done with a "filename extension" which is the part of the file name after the last period character in the file.

Some common file extensions and formats are:

- Image:
    - **.JPG** or **.JPEG** - Joint Photographic Experts Group
    - .**GIF** - Graphics Interchange Format - used for graphics
    - **.PNG** - Portable Network Graphics - has transparency
    - **.TIF or .TIFF** - Tagged Image Format File
    - **.BMP** - Bitmap File - Microsoft

- Video:
    - **.MP4** - Motion Pictures Expert Group
    - **.MOV** - Apple Quicktime format
    - **.WMV** - Windows Media Format
    - **.AVI** - Audio Video Interleave - older format still in use
    - **.FLV** - Flash Video File

- Audio:
    - **.MP3** - most common compressed format - lossy compression - small files
    - **.WMA** - Windows Media Audio - lossless compression
    - **.WAV** - Waveform Audio File

- Document:
    - .**DOC** or **.DOCX** - Microsoft Word
    - **.PAGES** - Apple Pages
    - **.PDF** - Portable Document Format
    - **.TXT** - text file with no formatting
    - **.RTF** - Rich Text Format

- Spreadsheets
    - **.XLS** or **.XLSX** - Microsoft Excel
    - **.NUMBERS** - Apple Numbers

- Presentations
    - **.PPT** or **.PPTX** - Microsoft Powerpoint
    - **.KEY** - Apple Keynote

- Executable
    - **.EXE** - Microsoft Windows executable program
    - **.APP** - Apple Mac application

- Webpages
    - **.HTML** - Hypertext Markup Language

There are hundreds of different common file formats and extensions and several good online resources to view these (See the References section below).

The size of each file is measured in bytes which is an 8 bit binary character with values from 0 - 255. You will often hear terms related to the number of bytes:

- **Byte** (**B**) - 8 bits (1 character) - text messages, short email messages without attachments
- **Kilobyte** (**KB**) - thousand bytes (1,024 bytes) - larger email messages, documents, small images
- **Megabyte** (**MB**) - million bytes (1,024 kilobytes) - images, short videos
- **Gigabyte** (**GB**) - billion bytes (1,024 megabytes) - long videos
- **Terabyte** (**TB**) - trillion bytes (1,024 gigabytes) - often used to measure larger disks

Data Libraries

In addition to computer files, some types of data can be stored in program libraries. Photo libraries (like Apple Photos and Google Photos) can store both images (pictures) and videos. The Apple iCloud uses libraries for music, books, contacts, calendars and other types of data. Each Apple device has settings to connect the local version of the library (on the device) to the Apple Cloud ("iCloud"). On your computer, the library is stored as a single file which is much more efficient than separate files.

In many cases, like photos, the data can either be in the program library or stored as a file on your computer. The process of putting a file into a library is called "importing" and the process of creating a file from a library is called "exporting".

It is easy to export a photo or video from your photo library and convert it to a file in a folder on your computer. On a Mac, this can either be done by dragging the file to a Finder window or the desktop or using the Export option on the File menu in the Photo app.

You can also put a photo file into your photo library by either dragging it to a Photos window or using the Import option on the Files menu in the Photos app.

If you are using Google Photos to store your images, you can use the Download button to export the image to a file on your computer or the Upload button to bring an image from your computer into Google Photos.

Data libraries also support a mechanism to organize your data. In photo applications, this is usually called "albums". In music applications these are normally called "playlists".

Email

Email messages are different from files on your computer. They are more like the other data libraries. You receive messages which are stored on an Internet server of your email vendor (e.g. Google for Gmail, Microsoft for hotmail, Yahoo, etc.).

There is a local copy of the recent email messages on your device. Each message can contain text, images and attachments of various types. The attachments can be downloaded to your device as files. You can also print an email message as a PDF to generate a PDF file on your device.

Google applications including Gmail use "labels" to organize data. Each data item (e.g. email message) can have multiple labels, so this is different from email applications like Outlook, Apple Mail or Yahoo that use a hierarchy of folders for organizing data where each item is in exactly one folder at a time.

The term "folder" comes from the idea of a physical paper folder in a filing cabinet. The word "label" comes from the concept of a colored sticky label you can put on a piece of paper. The paper can have multiple labels but can only be put into one folder.

In Apple Mail and most email systems, each email message is in one folder. Messages people send you come into your Inbox folder and can be deleted (moved to the Trash folder) or a different named folder that you create. The Spam (or Junk) folder is used by the email system for emails that might be dangerous or unwanted. Messages you send are put into a Sent folder.

The Google mail system (Gmail) uses labels. They are actually displayed as small labels at the top of the email message, e.g.:

In this case, this email message is in the Inbox and also has a label called "Senior Planet". In Gmail you can automatically add labels to messages using Filters. There is a talk on this called Gmail Labels on my website:

http://davetaenzer.com/docs/

The important thing to understand is that email folders are not the same as file folders. They both use the name "folder" to name a similar concept but they are completely different.

Cloud Data Storage

As I described in two earlier talks which are on my website, you can have your data duplicated to an Internet ("Cloud") account. On the Mac you have settings which determine which applications store their data on the iCloud (Apple Cloud). You can also specify that the Documents and Desktop folders on your Mac are stored on iCloud.

In the first case, e.g. Contacts, when you add a contact the data is automatically copied (or synchronized) with the contact data on your iCloud account. When you view your contacts on another device, e.g. your phone or iPad, the Contacts app automatically synchronizes with the iCloud data and copies the new information down from the Internet. The "master" copy of the data resides on the Cloud and each device maintains a local copy which is synchronized with the Cloud to upload changes or download new data which was changed on another device.

In the second case, when you specify that your Documents and Desktop should be stored on your iCloud account, new files you create or change on your computer are automatically sent up to your iCloud account. This is often called "mirroring" because the Cloud is keeping an exact duplicate of what is on your Mac. If you delete a file, it will also be deleted from your iCloud account.

Backup systems, like Time Machine on the Mac, store not only the current version of your data files but also the history so that you can recover files that were deleted or changed.

You can view your Document and Desktop files using an app on the iPhone and iPad called "Files".

Google and Microsoft provide similar services. In Google, this is called "Google Drive" and is used to store your data files on your Google Internet account.

For Microsoft, this is called "OneDrive" and acts in a similar way. You can install software on your computer to automatically synchronize your data files with the Internet versions (either Google Drive or OneDrive).

Dropbox is another vendor that lets you store your files on an Internet account. There is Dropbox software to automatically mirror any folder on your computer to your Dropbox account.

One way to think of these Cloud storage services is as an external hard drive that lives on the Cloud and can be simultaneously connected to all of your devices. This is not strictly true since with iCloud your Mac and other devices only have local copies of the files you are using so this requires less storage space.

One big advantage of Cloud storage over an external hard drive is that it is automatically secured with encryption. This means that all your data is scrambled so other people cannot read it.

Another advance of the Cloud storage services is that they make it very easy to share access to your files with other users. You can share a file or folder in a read-only or editable fashion with any other person you like.

References

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