Supplemental Reading for Print Services

Printers

Sometimes you just need to create a hard copy of something on a computer. You need to be able to pass it around, mark it up, or store something as a physical copy. This is where a printer comes in! Printers work in a lot of different ways. In each case, the printer uses some type of printing technology to apply an image to a printing substrate such as paper, plastic, cloth, or just about any sort of surface you can imagine!

Printer technologies

Over time, many types of printing technologies have been developed. Here are some of the most common types:

Inkjet printersuse arrays of very small nozzles to spray ink onto the printing substrate. These are very versatile printers that can print onto a lot of different surfaces.

- https://en.wikipedia.org/wiki/Inkjet_printing
- https://computer.howstuffworks.com/inkjet-printer.htm

Laser printersuse a laser to draw an image in static electricity on a **photosensitive drum**. The statically charged image on the drum attracts a powdered pigment called **toner**, which is transferred onto the paper and **fused** in place!

- **https://en.wikipedia.org/wiki/Laser_printing**
- **https://computer.howstuffworks.com/laser-printer.htm**

Impact printerswork sort of like a typewriter. A **dot-matrix printer**, for example, has an array of small pins that press against the paper through an inked ribbon. Dot-matrix printers used to be very common, but now are only used in special situations. One example of this is when you need to print on **carbon (or carbon-less) copy paper**.

- **https://en.wikipedia.org/wiki/Dot_matrix_printer**

Thermal printersapply heat to special **thermochromatic paper**. Thermochromatic paper changes color when it is heated, so thermal printers don't require any ink! Thermal printers are very commonly used as receipt printers.

- **https://en.wikipedia.org/wiki/Thermal_printing**

3D printersdon't apply an image to a substrate. 3D printers slowly layer small amounts of material at a time to create 3-dimensional objects! There are a lot of types of 3D printing technologies, and you need not only drivers, but other special software to build the instructions for your specific 3D printer.

- **https://en.wikipedia.org/wiki/3D_printing**
- **https://en.wikipedia.org/wiki/3D_printing_processes**
- **https://3dinsider.com/3d-printer-types/**

Viewing your printers

To see what printers are already installed in your operating system, navigate to the OS's printer settings. You can also add new printers, and manage existing printers from there.

- In Windows, you will go to one of two places, depending on the version of Windows that installed. You will go to either **Settings > Devices > Printers & Scanners**, or to **Control Panel > Printers and Devices**.
- In MacOS, navigate to **System Preferences > Printers & Scanners**.
- There are a lot of different utilities for configuring printer settings in Linux. Take a look at the documentation for your version of Linux to be sure. Just as an example, for one common distribution of Linux, Ubuntu, you will navigate to **Activities > Printers**.

Each printer in your OS has a **print queue**, or **print spool**. If you send multiple **print jobs** to a printer, those jobs will line up in the queue to be handled, one at a time. Print jobs can be reordered or cancelled while they are in the print queue.

- **Windows - View the print queue**
- **MacOS - Use the Dock on your Mac to check on a printer or print job**
- **Ubuntu - Cancel, pause or release a print job**

Your operating system will have a **default printer.** If you only have one printer, then that will be the default printer. If you have multiple printers configured, then you can select one to be used, well, by default!

- **Windows - How to set a default printer in Windows 10**
- **MacOS - Change the default printer or a printer's name on your Mac**
- **Ubuntu - Set the default printer**

Installing a printer

Printers can be pretty complicated devices, with lots of settings. There are dozens of common printer brands and thousands of printer models. Your operating system has a printer service, and knows how to talk to many printers, but it might not know how to talk to your printer. Operating systems have generic printer **device drivers** that will work for many common styles of printers. Beyond this, major operating systems will also understand how to search catalogs of device drivers in order to find the correct driver for a given printer. If your operating system does not automatically locate a driver for the printer you are trying to install, then the best place to look is on the printer manufacturer's support website. Remember, device drivers are specific to your operating system, so be sure to use the correct drivers for your OS.

- Windows - How to install a printer in Windows 10
- MacOS - How to add a printer on your Mac
- Use your Mac to print to a printer connected to a Windows computer
- Ubuntu - Printing

One thing you may notice when you are looking at printer device drivers is that some printers can speak more than one **page description language**. The most common of these languages are **PostScript (PS)**, and **Printer Command Language (PCL)**. Some printers will work better with one language than another. Most of the time, whatever is default or recommended by the printer manufacturer is what you should go with. Sometimes, the applications that you are printing from will prefer one language over another. If your printer supports multiple languages and it is failing to print certain documents, or failing to print from certain applications, you might try a different language.

Virtual Printers

What do you do if there is an important document that you want to save, but you don't need a paper copy? You can use a **virtual printer**. A virtual printer is a

printer driver that looks like a real printer to the operating system, but instead of printing print jobs onto paper, it creates a file! Virtual printers have names like "**Print to PDF**", or "**Print to File**". You can use virtual printers to create documents like **PDFs**or **XPS** files, or just about any type of image file!

- Microsoft XPS Document Writer
- Save a document as a PDF on Mac
- Ubuntu - Print to file

Printer Sharing

What if you have a printer attached to your computer, and you want to share that printer with someone who is using a different computer? You can! You can **share** your printer! When you share your printer, you are making it available to other computers as a **shared printer**. With a shared printer, other computers will send print jobs across the network to the computer that is attached to the printer. Take a look at these instructions on how to share your printer, and connect to the shared printer:

- Windows - How to share your network printer
- MacOS - How to share your printer on Mac
- MacOS - How to add a printer on Mac

Network Printers

Some printers can be directly attached to the network without having to be shared by a computer's operating system. These are standalone **network printers**. You can add network printers to your computers in a very similar way as a shared printer:

- Windows - How to install a printer in Windows 10
- MacOS - How to add a printer on Mac
- Network printing from Ubuntu

Watch out! Some network printers contain hard drives or other storage that are used to hold jobs in a print queue. This storage can end up holding on to some pretty sensitive information! Make sure to control access to this storage. Destroy the storage or **securely** delete any data from this storage before servicing, selling, or disposing of a network printer!

Print Servers

What if you have just a few printers, and a several people who need to share those printers? You might need a print server! Print servers work similarly to a local printer share, but on a larger scale. They can accept many print jobs at once, and will **queue** or **spool** the print jobs so they can be processed one at a time by the printer(s).

- Print and Document Services Overview
- Ubuntu - CUPS Print Server