# 3D Printer Methods, Networks and Specifications

**Network**

Methods:

* The use of bridges, switches, repeaters and hubs to network 3D printers.
* Repeater and hubs. Wireless Repeater, <http://wirelessrepeater.org.uk/>
* Bridge Network, <https://en.wikipedia.org/wiki/Bridging_(networking)>

Bridge will allow the 3D print network to connect to point 5.

* USB Network switch to link printers, <https://www.euronetwork.co.uk/usb/usb-switches>
* USB repeater from switch to point 5.
* Wifi might be a viable option as it is lower cost of instalment, no need for physical lines. Most of the 3D printers that I looked at where Wifi and USB. Security may be more of an issue and data rates slower with Wifi but less invasive.
* USB2.0 to Ethernet adapter. (Ethernet faster than USB)
* Third Party software like 3DPrinterOS allows you to connect and control multiple 3D printers from a computer or phone. New technology.

Assumptions

* Connection point 5 of the Networking diagram will provide a firewall or some form of security.

## **3D Printers**

Main consideration in Additive Manufacturing (3D printing) is print speed, cost of the printer and materials, material compatible and colour selection.

3D Printers, <http://uk.rs-online.com/web/p/3d-printers/7990455/>

Methods:

* FDM (Fused Deposition Modelling) is the most commonly used printing method in industry today. It is a cheaper alternative to more modern and faster print technologies like SLA and SLS. <http://www.stratasys.com/3d-printers/technologies/fdm-technology>
* FFF (Fused Filament Fabrication) Very similar method to FDM developed after by another company.
* SLS (Selective Laser Sintering)
* SLA (Stereo lithography)

Materials:

* ABS (Acrylonitrile butadiene styrene) and PLA (polylactide) are the most commonly used thermoplastic polymers in 3D printing. Used to make products from Lego to white water canoes. <http://wiki.ultimaker.com/PLA>
* ABS is a much hardier plastic than PLA. Printed materials in PLA are more susceptible to warping in lower temperatures than ABS. Better quality products with ABS. PLA is made from corn starch or sugar. It is biodegradable with very low impact on the environment. Benefits of carbon credits.
* Metal, glass, nylon, others.

**Other References:**

Existing 3D printer hubs: <https://all3dp.com/make-money-3d-printing-networks/>

3D Hubs printing company, available at: <https://www.3dhubs.com/>

3D print tech comparisons and reviews, available at: <http://www.economist.com/news/technology-quarterly/21584447-digital-manufacturing-there-lot-hype-around-3d-printing-it-fast>

Differences between wifi bridges and repeaters, <http://classroom.synonym.com/difference-between-wifi-bridges-wifi-repeaters-16865.html>