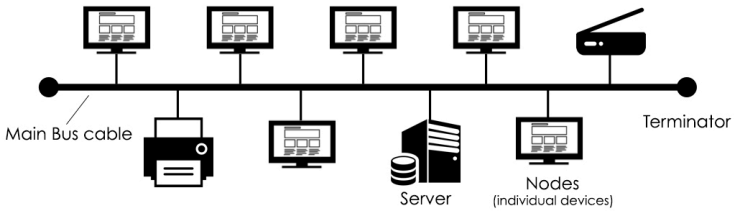
Network Topologies

Network Topologies describe how the parts of a wired network are arranged and connected together. The topology includes the **nodes** (e.g. computers, printers, servers etc…) and the **connections** (cables).

topology – the arrangement of devices in a network
node – a device on a network

Bus topology

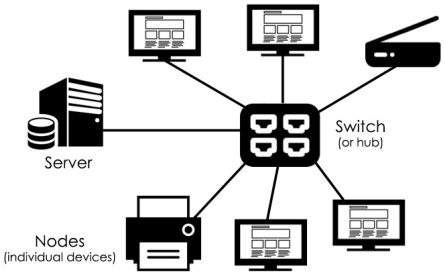
Each device (**node**) is connected to a long, single cable (the **bus cable**) which acts as a **backbone** to all the devices in the network. Each device is connected using a T piece connector. A **terminator** is needed at the end of the network to stop the signal from bouncing back down the bus cable.



Advantages	Disadvantages
Less cable needed – easy and cheap to set up	Cable length limits the number of nodes which can be connected
Quick to set up a small network without the need for components such as switches	Security – all data passes every device on the network, posing a potential security risk
	If bus cable breaks the whole network is down
	Cable breaks take time to fix – you need to check every cable on the network to be sure where the break is
Suitable for small or temporary networks only – performs well for small networks but as devices are added the **network speed** slows because only one node can communicate at any time	

Star topology

Each work station is individually connected to a central point – usually to a **switch** which then connects to a **server**. The switch reads the destination address of any data and directs it only to the intended work station or server, reducing the security risk compared to a bus network.



Star topologies produce reliable networks and are suitable for offices, schools etc… Network speeds are generally consistent and these networks usually perform well.

Advantages	Disadvantages
More secure – data is directed by the switches so does not pass every device	Requires switches and more cable than a bus topology – more expensive and more work to set up and maintain the network
Switches mean that network traffic is reduced – only the busy areas get lots of traffic rather than the whole network. This increases network speed	If a switch fails the whole section of the network it controls goes down
If a switch fails all machines attached to it will fail – but just those machines rather than the whole network. This can make finding and fixing faults easier.	