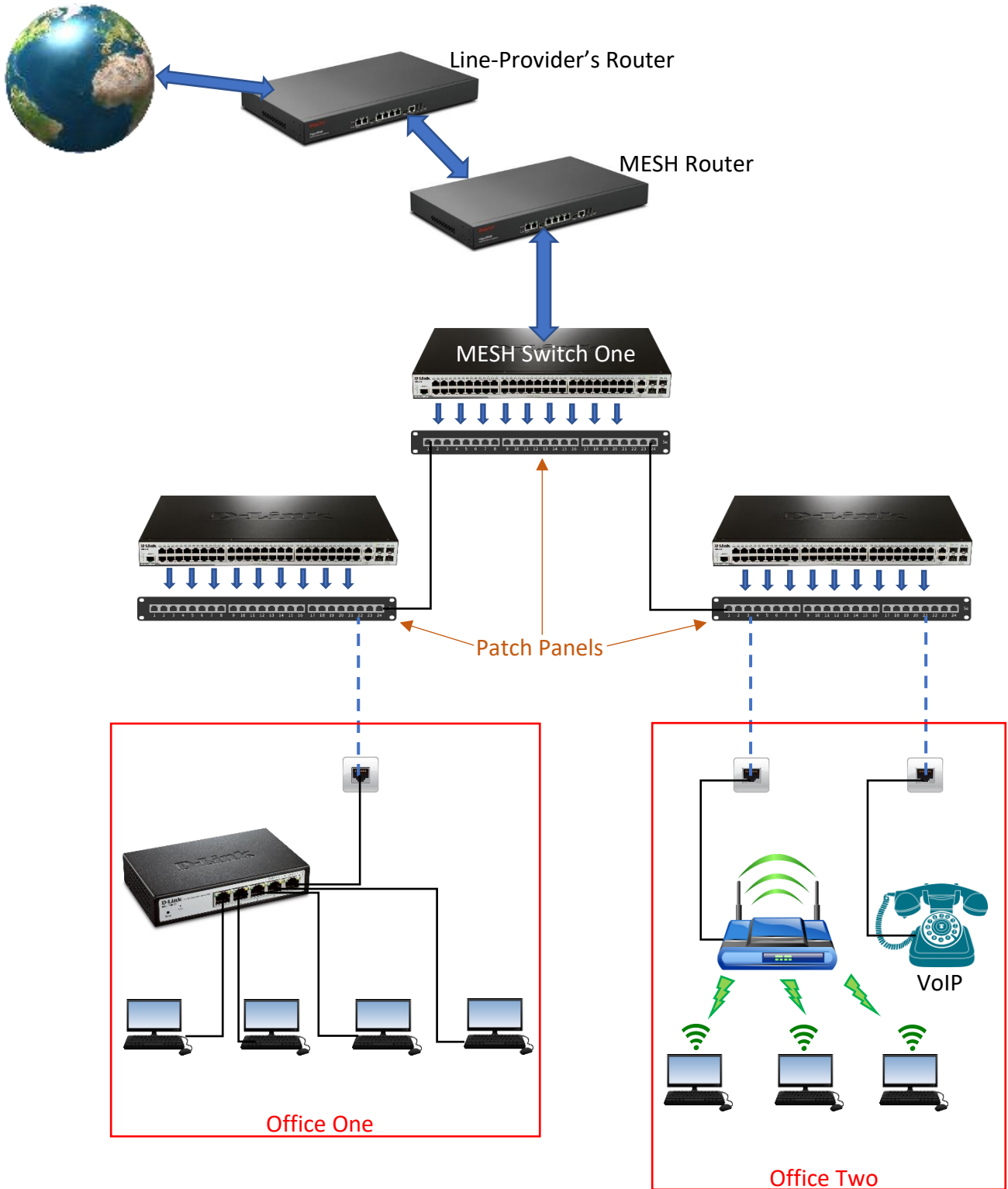


Computer Networks – the Basics



This is a simple overview of how networks can be interconnected – please see next page for some explanations.

The previous drawing shows how a number of networks are commonly interconnected. The following provides some simple explanations of what is going on; it is set in context of a typical MESH installation.

Routers

The top two network devices are routers. They join networks together and are very intelligent in that they can determine the routes necessary for your data to leave your computer and reach other devices – anywhere in the world. Don't forget that not all routers are necessarily powered or working all the time, so they have to keep on their toes to stay up-to-date in a very changeable environment.

Routers also provide something called a *gateway*. These are commonly the way in and out of a network, building or organisation. The first router in the drawing is situated inside a business centre, it was provided by the supplier of the line; this is much the same as the equipment BT might provide as part of a domestic broadband service.

The second router is probably physically located within a metre of the first one, but it represents the in and out of the MESH network. It is also running the software that manages all the configurations within the site.

Switches

At a basic level, switches are not as intelligent as routers. The small switch with five ports in *Office One* just takes data from each computer connected to it and passes it to the required recipient – it is really what makes that small network (*LAN*) in the office. As it is not a router, the LAN effectively extends back to MESH.

If it receives data for somewhere it does not know about e.g. somewhere on the internet, it just forwards it to its *gateway* which, in this case, is the MESH router.

The MESH switches are cleverer than this in that they keep many LANs separate, but you can think of them as hubs – allowing many devices to interact.

Patch Panels

Patch panels simply allow the flexibility to physically connect two devices or locations. Their main advantage is that the connections can be changed very easily. For example, it would be possible to connect the two offices together if you wanted to. Obviously, many connections have been left out of this drawing to aid clarity!

Wireless Routers

Office Two has a wireless router. It's receiving a network connection from MESH and passing it on to the devices in the office wirelessly. However, as it is a router and not a switch, it is also acting as a gateway and the office wireless LAN (WLAN) starts and ends here i.e. the addresses are different in the office than between the wireless router and MESH.

VoIP Phones

Voice-over-IP phones are network devices. The one in *Office One* goes back to MESH and finds its own special LAN.

IP Addresses

This is not the place to get into the ins-and-outs of how IP addresses work, but they do define the boundaries of networks. See the next drawing to get the principle of how they do this.

All the numbers can look confusing, but you can see that those between the two top routers are similar – this is a separate network. *Office One* has a range of numbers that is different again to all the others you can see (10.0.65.x); these are generated by MESH and the little office switch is effectively transparent.

Office Two's wireless router connects to MESH via a similar (but different) network address (10.0.66.x); but being a router, it generates yet another network address for those devices that connect to it (192.168.1.x).

The VoIP phone is on another network with all the other phones in the building (10.0.200.x).

