

Networking: switches, routers, and wireless access points

Switches, routers, and wireless access points are the essential networking basics. Through them, devices connected to your network can communicate with one another and with other networks, like the Internet. Switches, routers, and wireless access points perform very different functions in a network.

Switches

Switches are the foundation of most business networks. A switch acts as a controller, connecting computers, printers, and servers to a network in a building or a campus.

Switches allow devices on your network to communicate with each other, as well as with other networks, creating a network of shared resources. Through information sharing and resource allocation, switches save money and increase productivity.

There are two basic types of switches to choose from as part of your networking basics: on-premises and cloud-managed.

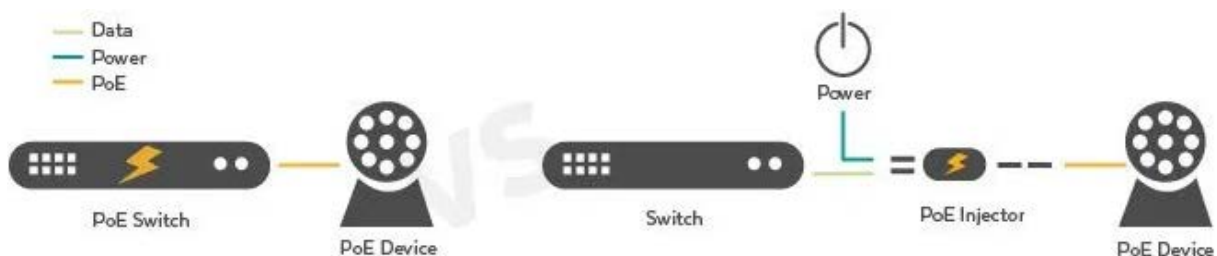
A managed on-premises switch lets you configure and monitor your LAN (Local Area Network), giving you tighter control of your network traffic.

POE Switch

What is PoE?

Traditionally, when a device is connected to a network it requires two inputs: a power cord and a network cable. PoE is a technology that allows an Ethernet cable to carry electrical power.

In a PoE network, the power sourcing equipment can supply power and transmit data to network devices. All this is done by a single, PoE cable.



What Devices Can Use PoE?

PoE provides value for devices and networks that require power but also involve the transmission of data. The number of devices controlled remotely and requiring data is increasing exponentially as companies take advantage of the Internet of Things (IoT). The number of IoT devices connected worldwide is expected to reach 75 billion by 2025!

This rapid expansion of network-connected devices will only increase the importance of PoE technology to most networking infrastructures.

While PoE has numerous applications, the three most common areas of implementation are currently:



VoIP Phones: VoIP phones are the original PoE devices, with PoE allowing for a single connection to the wall socket and the ability for remote powering down



IP Cameras: Security camera technology is constantly evolving, and one improvement is the use of PoE, enabling fast deployment and simple repositioning.



Wireless: Many wireless access points are PoE compatible, allowing for remote positioning. RFID readers are also often PoE compatible, which allows for easy relocation.

A more recent technology that benefits from PoE is smart home automation. This includes LED lighting, heating and cooling systems, appliances, voice assistants, and electric car charging stations.

Routers

Routers connect multiple networks together. They also connect computers on those networks to the Internet. Routers enable all networked computers to share a single Internet connection, which saves money.

A router acts a dispatcher. It analyzes data being sent across a network, chooses the best route for data to travel, and sends it on its way.

Beyond those basic networking functions, routers come with additional features to make networking easier or more secure. Depending on your security needs, for example, you can choose a router with a firewall, a virtual private network (VPN), or an Internet Protocol (IP) communications system.

Access Points

An access point* allows devices to connect to the wireless network without cables. A wireless network makes it easy to bring new devices online and provides flexible support to mobile workers.

An access point acts like an amplifier for your network. While a router provides the bandwidth, an access point extends that bandwidth so that the network can support many devices, and those devices can access the network from farther away.

But an access point does more than simply extend Wi-Fi. It can also give useful data about the devices on the network, provide proactive security, and serve many other practical purposes.

What is a switch vs. a router?

Computers can be connected to each other via a switch or a router. So what is the difference between the two? The most basic explanation is that a switch is designed to connect computers within a network, while a router is designed to connect multiple networks together.

In a home network, a single router is usually all that is required for connecting devices to the Internet. All devices within a home, such as computers, tablets, and smartphones can connect to the router via a wired or wireless connection. As the name implies, the router routes all connected devices to a cable or DSL modem.

Switches are most often used in large networks, such as those found in business and school environments. They connect many computers together within a single local area network, or LAN. A large network may include multiple switches, which connect different groups of computer systems together. These switches are typically connected to a router that allows connected devices to access the Internet.

Even though routers and switches are different, they can be used interchangeably. For example, a router typically has several LAN ports and a single WAN port. The LAN ports are designed for connecting computers via Ethernet. The WAN port is designed to connect to the modem. While switches do not have WAN port, you can use any of the standard LAN ports to connect to a modem. However, you may have to use a crossover Ethernet cable in order for the connection to work properly.

Though it may be possible to use a switch as a router, switches typically do not have the same configuration options as routers do. Switches used to be faster than routers, but modern routers are capable of the same performance. Therefore, when choosing a central device for your home network, a router makes the most sense.



POE Switch and Network Switch



Front and Back of an Access Point





Router