

What are network devices?

Network devices, or networking hardware, are physical devices that are required for communication and interaction between hardware on a computer network.

Types of network devices

1. Hub
 2. Switch
 3. Route
 4. Bridge
 5. Gateway
 6. Modem
 7. Repeater
 8. Access Point
-

Hub



Hubs connect multiple computer networking devices together. A hub also acts as a repeater in that it amplifies signals that deteriorate after traveling long distances over connecting cables. A hub is the simplest in the family of network connecting devices because it connects LAN components with identical protocols.

A hub can be used with both digital and analog data, provided its settings have been configured to prepare for the formatting of the incoming data. For example, if the incoming data is in digital format, the hub must pass it on as packets; however, if the incoming data is analog, then the hub passes it on in signal form.

Hubs do not perform packet filtering or addressing functions; they just send data packets to all connected devices. Hubs operate at the Physical layer of the Open Systems Interconnection (OSI) model. There are two types of hubs: simple and multiple port.

Switch



Switches generally have a more intelligent role than hubs. A switch is a multiport device that improves network efficiency. The switch maintains limited routing

information about nodes in the internal network, and it allows connections to systems like hubs or routers. Strands of LANs are usually connected using switches. Generally, switches can read the hardware addresses of incoming packets to transmit them to the appropriate destination.

Using switches improves network efficiency over hubs or routers because of the virtual circuit capability. Switches also improve network security because the virtual circuits are more difficult to examine with network monitors.

You can think of a switch as a device that has some of the best capabilities of routers and hubs combined. A switch can work at either the Data Link layer or the Network layer of the OSI model. A multilayer switch is one that can operate at both layers, which means that it can operate as both a switch and a router. A multilayer switch is a high-performance device that supports the same routing protocols as routers.

Switches can be subject to distributed denial of service (DDoS) attacks

Router



Routers help transmit packets to their destinations by charting a path through the sea of interconnected networking devices using different network topologies. Routers are intelligent devices, and they store information about the networks they're connected to. Most routers can be configured to operate as packet-filtering firewalls and use access control lists (ACLs).

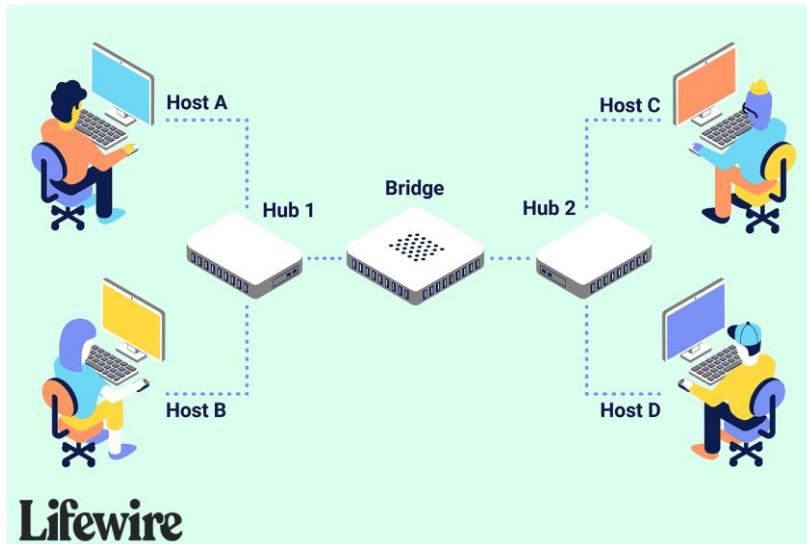
Routers, in conjunction with a channel service unit/data service unit (CSU/DSU), are also used to translate from LAN framing to WAN framing. This is needed because LANs and WANs use different network protocols. Such routers are known as border routers. They serve as the outside connection of a LAN to a WAN, and they operate at the border of your network.

Routers are also used to divide internal networks into two or more subnetworks. Routers can also be connected internally to other routers, creating zones that operate independently.

Routers are general-purpose devices that interconnect two or more heterogeneous networks. They are usually dedicated to special-purpose computers, with separate input and output network interfaces for each connected network.

The router, with the help of a routing table, has knowledge of routes a packet could take from its source to its destination. The routing table, like in the bridge and switch, grows dynamically.

Bridge



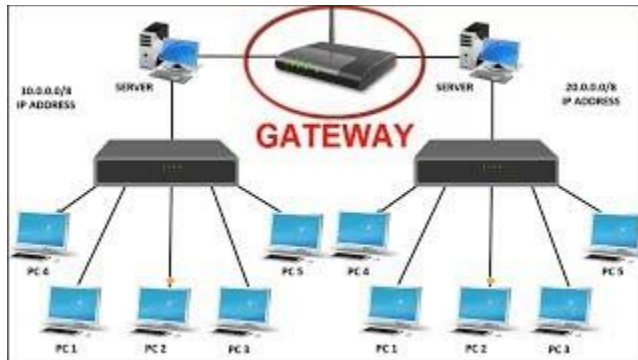
Bridges are used to connect two or more hosts or network segments together. The basic role of bridges in network architecture is storing and forwarding frames between the different segments that the bridge connects.

They use hardware Media Access Control (MAC) addresses for transferring frames. By looking at the MAC address of the devices connected to each segment, bridges can forward the data or block it from crossing. Bridges can also be used to connect two physical LANs into a larger logical LAN.

Bridges work only at the Physical and Data Link layers of the OSI model. Bridges are used to divide larger networks into smaller sections by sitting between two physical network segments and managing the flow of data between the two.

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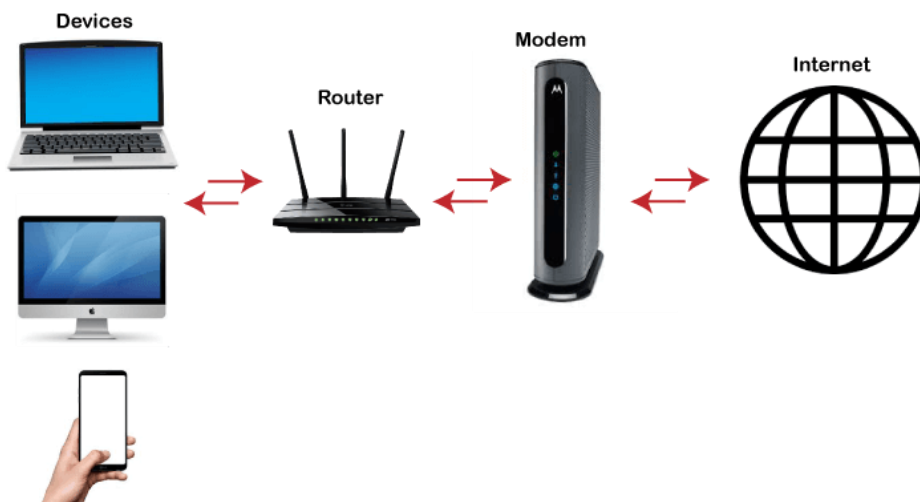
Gateway



Gateways normally work at the Transport and Session layers of the OSI model. At the Transport layer and above, there are numerous protocols and standards from different vendors; gateways are used to deal with them.

Gateways provide translation between networking technologies such as Open System Interconnection (OSI) and Transmission Control Protocol/Internet Protocol (TCP/IP). Because of this, gateways connect two or more autonomous networks, each with its own routing algorithms, protocols, topology, domain name service, and network administration procedures and policies.

Modem



Modems (modulators-demodulators) are used to transmit digital signals over analog telephone lines. Thus, digital signals are converted by the modem into analog signals of different frequencies and transmitted to a modem at the receiving location.

The receiving modem performs the reverse transformation and provides a digital output to a device connected to a modem, usually a computer.

Access Point



While an access point (AP) can technically involve either a wired or wireless connection, it commonly means a wireless device.

An AP works at the second OSI layer, the Data Link layer, and it can operate either as a bridge connecting a standard wired network to wireless devices or as a router passing data transmissions from one access point to another.

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Wireless access points (WAPs) consist of a transmitter and receiver (transceiver) device used to create a wireless LAN (WLAN). Access points typically are separate network devices with a built-in antenna, transmitter and adapter.

APs use the wireless infrastructure network mode to provide a connection point between WLANs and a wired Ethernet LAN. They also have several ports, giving you a way to expand the network to support additional clients. Depending on the size of the network, one or more APs might be required to provide full coverage.

End Of Assignment