

NETWORKING DEVICES

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NETWORKING DEVICES:

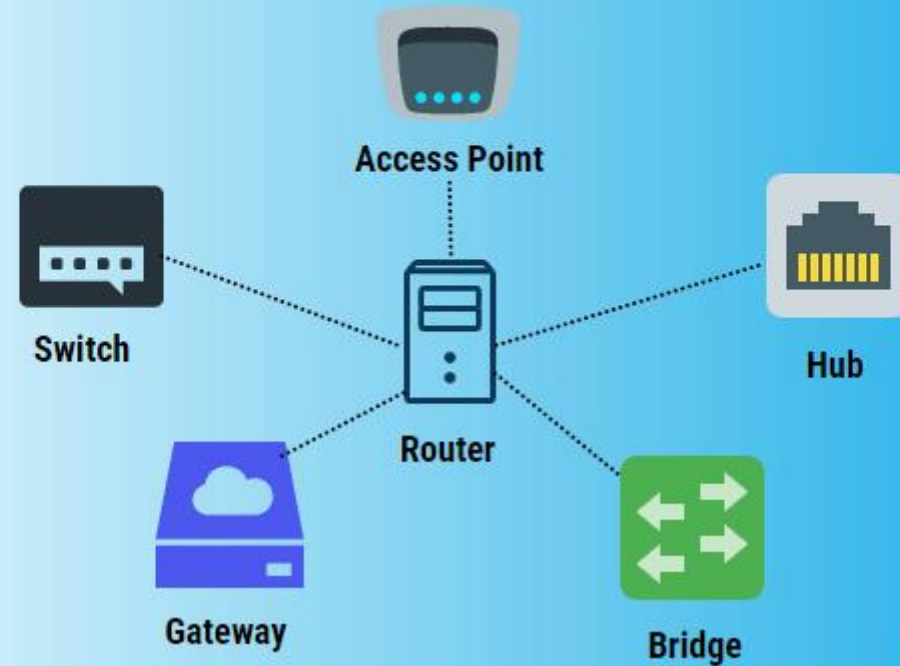
Network devices, also known as networking hardware, are physical devices that allow hardware on a computer network to communicate and interact with one another. For example Repeater, Hub, Bridge, Switch, Routers, Gateway, Brouter, and NIC, etc.

TYPES OF NETWORKING DEVICES:

Here is the common network device list:

- Hub
- Switch
- Router
- Bridge
- Gateway
- Modem
- Repeater
- Access Point

Types of Network Devices



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.



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.

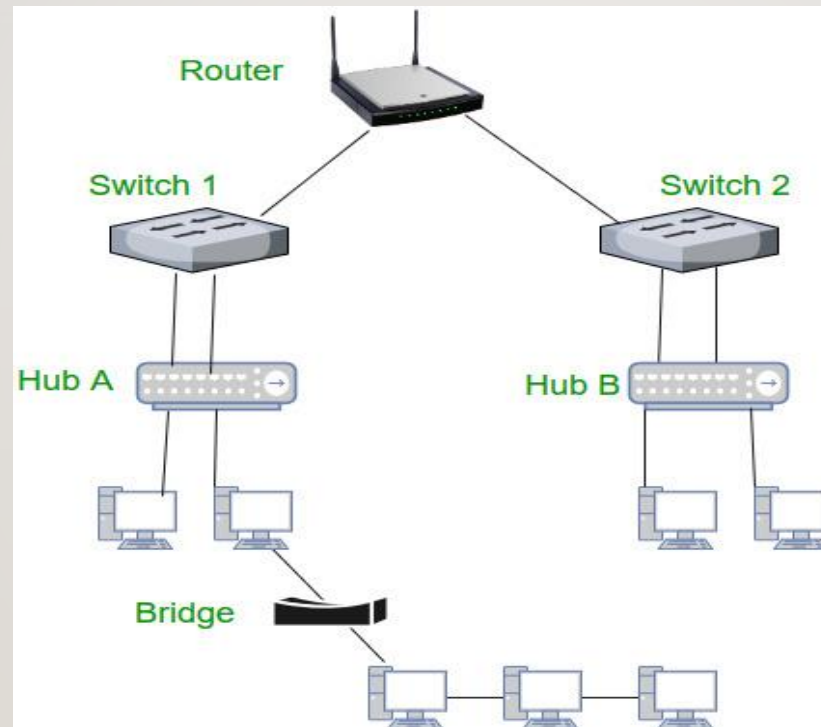
Using switches improves network efficiency over hubs or routers because of the virtual circuit capability. Switches also improve network security because the virtual circuits are more difficult to examine with network monitors. You can think of a switch as a device that has some of the best capabilities of routers and hubs combined.



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.

ROUTER:



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.



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.

Gateways perform all of the functions of routers and more. In fact, a router with added translation functionality is a gateway. The function that does the translation between different network technologies is called a protocol converter.

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. The digital data is usually transferred to or from the modem over a serial line through an industry standard interface, RS-232. Many telephone companies offer DSL services, and many cable operators use modems as end terminals for identification and recognition of home and personal users. Modems work on both the Physical and Data Link layers.

REPEATER:

A repeater is an electronic device that amplifies the signal it receives. You can think of repeater as a device which receives a signal and retransmits it at a higher level or higher power so that the signal can cover longer distances, more than 100 meters for standard LAN cables. Repeaters work on the Physical layer.

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.

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.



CONCLUSION:

Having a solid understanding of the types of network devices available can help you design and build a network that is secure and serves your organization well. However, to ensure the ongoing security and availability of your network, you should carefully monitor your networking devices and activity around them, so you can quickly spot hardware issues, configuration issues and attacks.