[Networking Hardwares]

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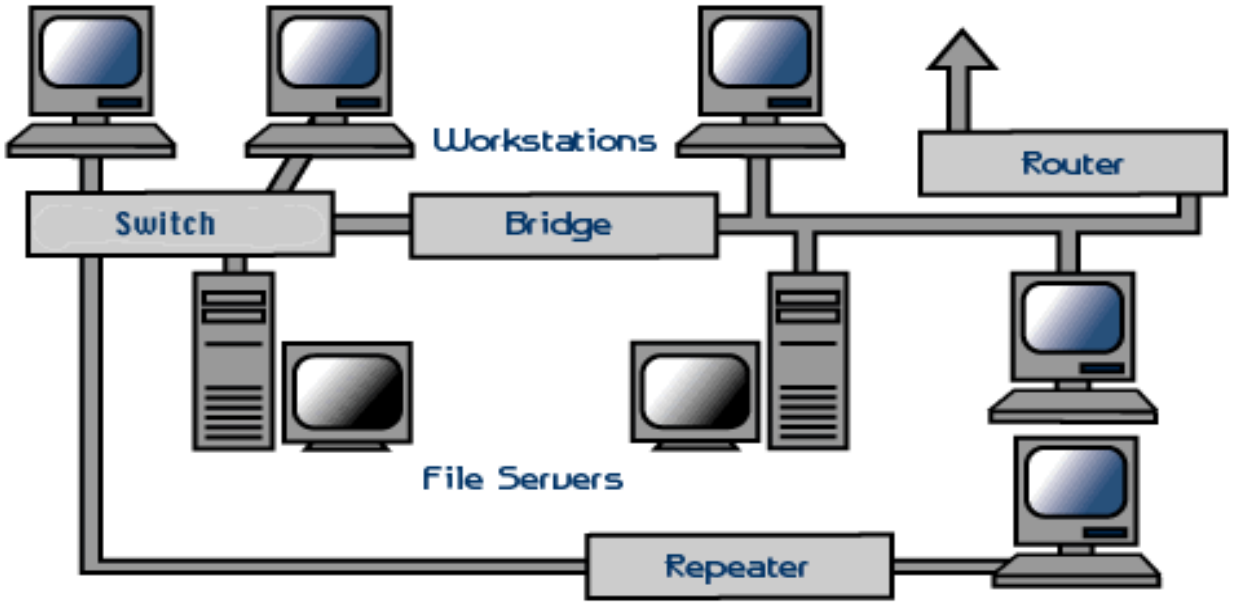
What is Networking Hardware?

Networking hardware includes all computers, peripherals, interface cards and other equipment needed to perform data-processing and communications within the network.



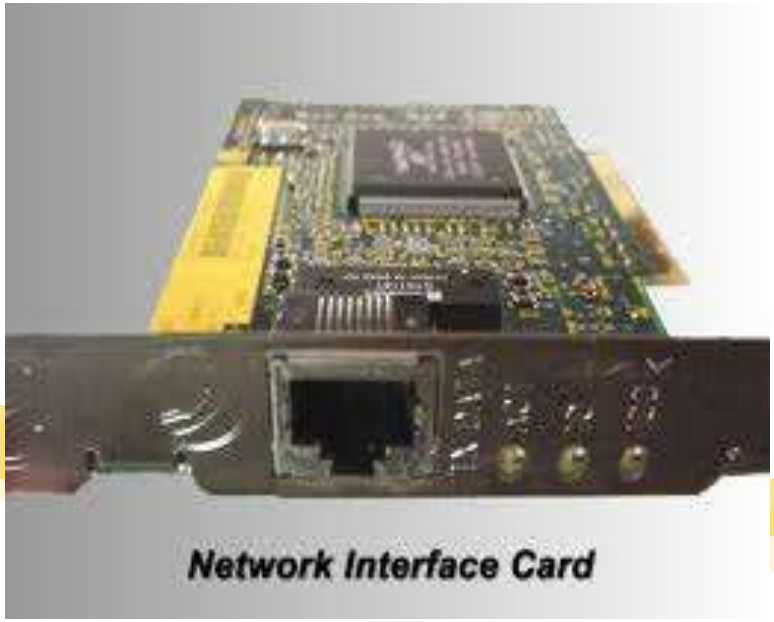
Networking Hardware

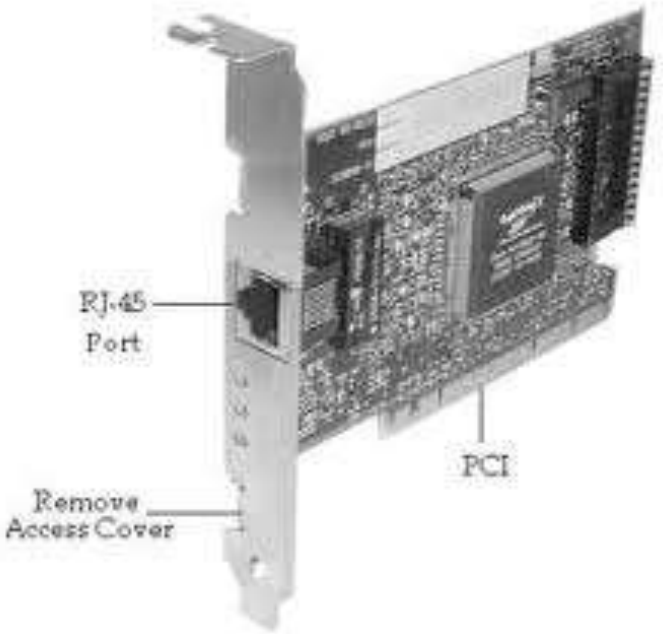
- Network Interface Card
- Hub
- Repeater
- Bridge
- Switch
- Gateway

Network Interface Cards

- Network interface cards, commonly referred to as NICs, are used to connect a PC to a network.
- The NIC provides a physical connection between the networking cable and the computer's internal bus.
- Different computers have different bus architectures; PCI bus master slots are most commonly found on 486/Pentium PCs and ISA expansion slots are commonly found on 386 and older PCs.
- NICs come in three basic varieties: 8-bit, 16-bit, and 32-bit. The larger the number of bits that can be transferred to the NIC, the faster the NIC can transfer data to the network cable.

Network Interface Cards





Hubs

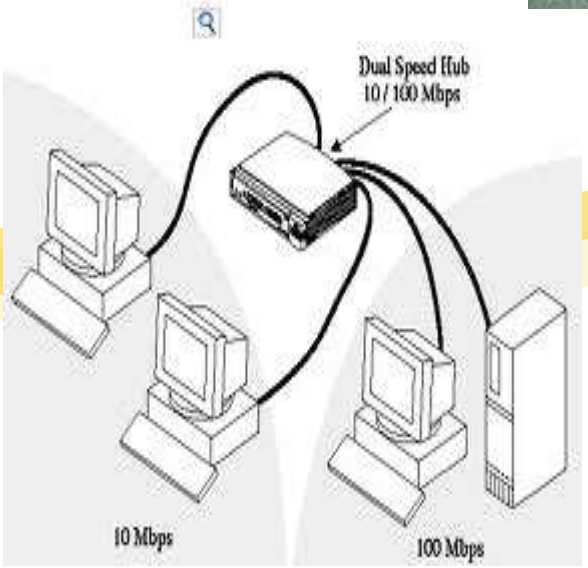
- A hub joins multiple computers (or other network devices) together to form a single network.
- On this network, all computers can communicate directly with each other.
- The networking hub is a junction box with several ports in the back for receiving the Ethernet cables that are plugged into each computer on the LAN.

Types of Hubs

- A ***passive hub*** serves simply as a passage for the data, enabling it to go from one device to another.
- ***Intelligent hub*** include additional features that enables an administrator to monitor the traffic passing through the hub and to configure each port in the hub.
- ***Switching hub,*** actually reads the destination address of each packet and then forwards the packet to the correct port.

Hubs

<< Ver más Hubs Switch



Repeater

- Since a signal loses strength as it passes along a cable, it is often necessary to boost the signal with a device called a repeater.
- A repeater is an electronic device that receives a signal, cleans it of unnecessary noise, regenerates it, and retransmits it at a higher power level so that the signal can cover longer distances without degradation.
- A good example of the use of repeaters would be in a local area network using a star topology with unshielded twisted-pair cabling.

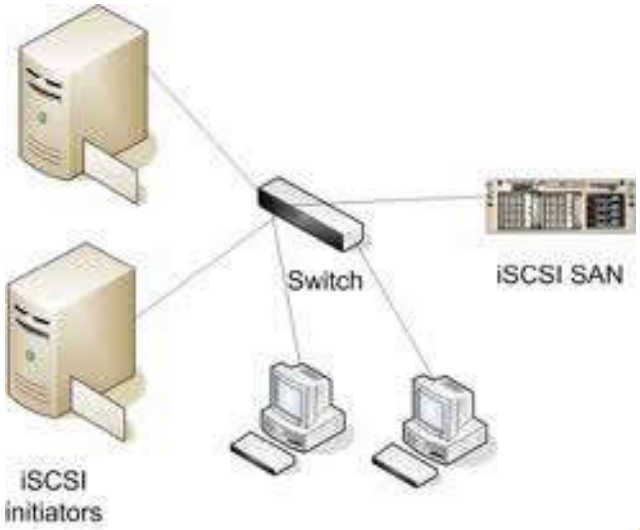
Repeaters


Internet
DSL/Cable Modem
Wireless Router
Wireless Repeater
Computer equipped with network adapter
Computer equipped with wireless adapter
Notebook equipped with wireless PCMCIA card

Switch

- A network switch is a small hardware device that joins multiple computers together within one local area network (LAN).
- Network switches appear nearly identical to network hubs, but a switch generally contains more intelligence than a hub.
- Unlike hubs, network switches are capable of inspecting data packets as they are received, determining the source and destination device of each packet, and forwarding them appropriately.
- Allow several users to send information over a network at the same time without slowing each other down.

Switch



Router

- A device to interconnect SIMILAR networks, e.g. similar protocols and workstations and servers.
- A **router** is an electronic device that interconnects two or more computer networks, and selectively interchanges packets of data between them.
- Each data packet contains address information that a router can use to determine if the source and destination are on the same network, or if the data packet must be transferred from one network to another.

Router

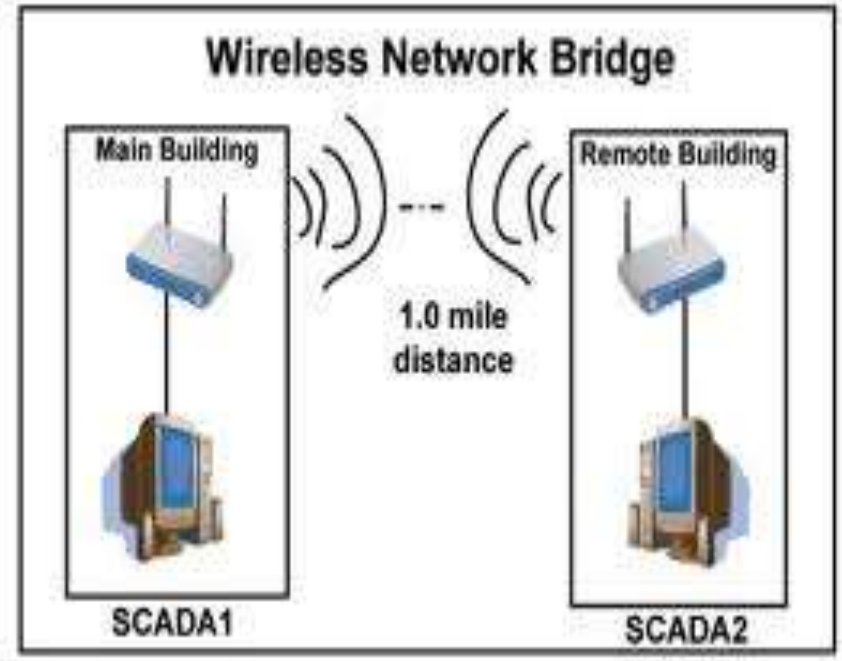
Bridge

- A bridge is a device that connects a local area network (LAN) to another local area network that uses the same protocol (for example, Ethernet or token ring).
- The function of a bridge is to connect separate networks together. Bridges connect different networks types (such as Ethernet and Fast Ethernet) or networks of the same type.
- Bridges map the Ethernet addresses of the nodes residing on each network segment and allow only necessary traffic to pass through the bridge. When a packet is received by the bridge, the bridge determines the destination and source segments.

Types of Bridges

- Bridges come in three basic types:
- **Local bridges**: Directly connect local area networks (LANs)
- **Remote bridges:** Can be used to create a wide area network (WAN) link between LANs. Remote bridges have been replaced with routers.
- **Wireless bridges:** Can be used to join LANs or connect remote stations to LANs.

Bridges

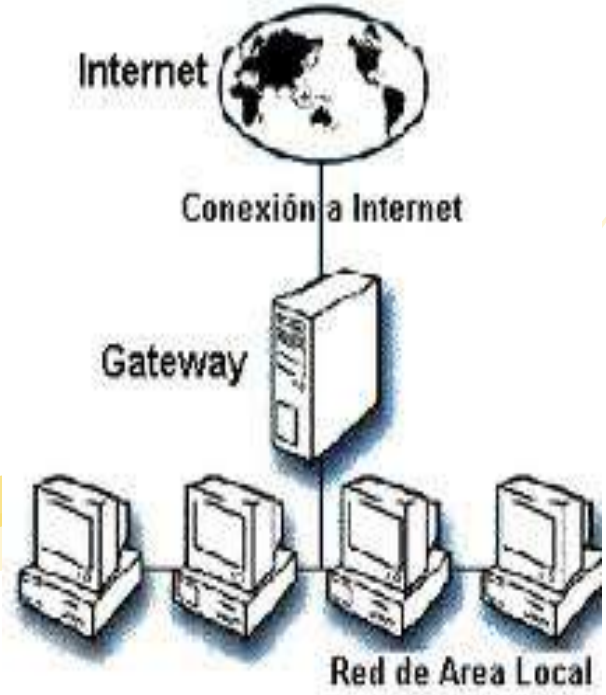

Wireless Network Bridge
Main Building
Remote Building
1.0 mile
distance
SCADA1
SCADA2

Gateway

- Gateways are used to interconnect two different networks having different protocols.
- Networks using different protocols use different addressing formats.
- A gateway is a network point that acts as an entrance to another network.
- Gateways are also called **protocol converters.**

Gateway


ICS
VoIP Gateway


Internet
Conexión a Internet
Gateway
Red de Area Local

What is the difference?

- **Bridge:** device to interconnect two LANs that use the SAME logical link control protocol but may use different medium access control protocols.

- **Router:** device to interconnect SIMILAR networks, e.g. similar protocols and workstations and servers.

- **Gateway:** device to interconnect DISSIMILAR protocols and servers, and Macintosh and IBM LANs and equipment