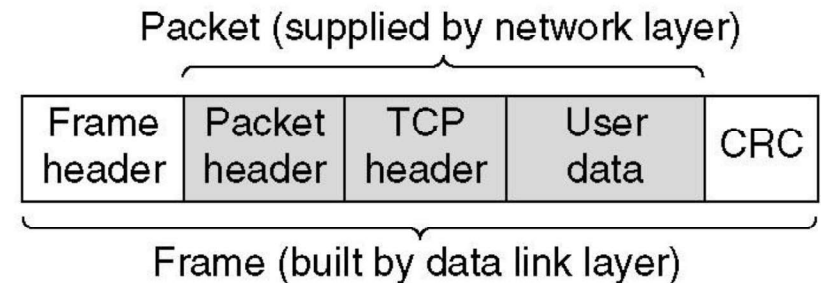


Repeaters, Hubs, Bridges, Switches, Routers and Gateway

- Operation at different layers, because they work on different pieces of information.

Application layer	Application gateway
Transport layer	Transport gateway
Network layer	Router
Data link layer	Bridge, switch
Physical layer	Repeater, hub

(a)



(b)

(a) Which device is in which layer.

(b) Frames, packets, and headers.

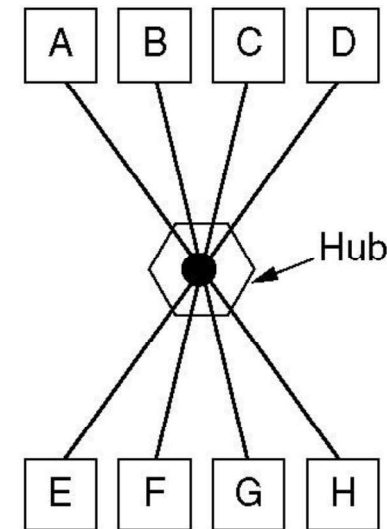
Repeaters, Hubs, Bridges, Switches, Routers and Gateway

■ Repeaters

- Analogue device, works at Physical layer.
- Use as a connectors only.
- Amplifies the signal, Only understand volts and can not differentiate between frames, packets, headers etc.

■ Hubs

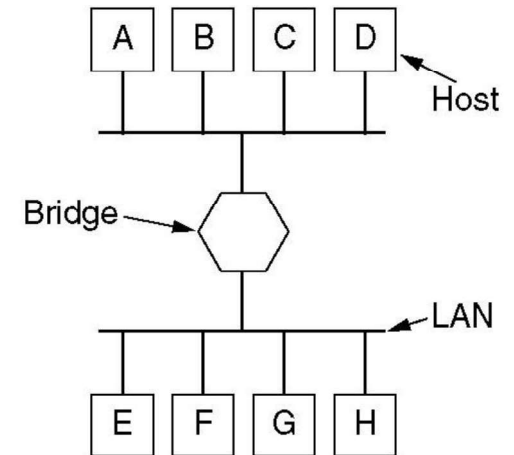
- Joins no. of lines electrically.
- Frames send to all the lines.
- Single Collision Domain.
- Do not amplify the signal.
- Do not examine the MAC addresses.



Repeaters, Hubs, Bridges, Switches, Routers and Gateway

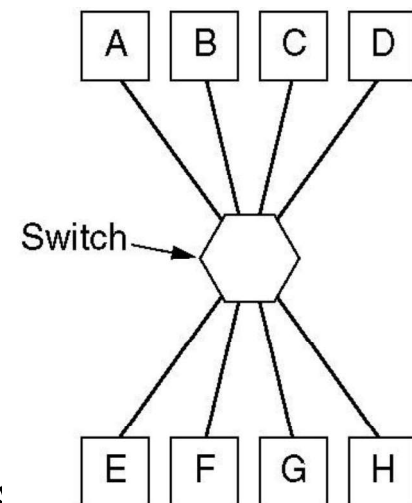
■ Bridges

- A Data Link Layer Device.
- Connects two or more LANs.
- Extract destination address and do forwarding.
- Each line in its own collision domain.
- Store and Forwarding



■ Switches

- A Data Link Layer Device.
- Use to connect individual Computers.
- A to B, in Bridges and Switches.
- Provides Buffer, No Collision.
- May discards the frames, Cut through switches



Repeaters, Hubs, Bridges, Switches, Routers and Gateway

▪ Routers

- Repeaters and Hubs, which are quite similar, as well as bridges and switches.
 - Router works at Network Layer and do routing of Packets.
 - Packet pass through routing software.
 - Works on 32 bit IPv4 or 128 bit IPv6 address, not on MAC address.
 - Choose the output line with the help of Routing table.
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Repeaters, Hubs, Bridges, Switches, Routers and Gateway

■ Gateways

- **Transport Gateway** work at transport layer.
 - Connects two computers using different connection oriented transport layer protocols and perform reformatting.
 - Example: TCP/IP with ATM
 - **Application Gateway** works at application layer.
 - Understand the format and content of data and translate message from one format to another.
 - Example: E-mail Gateway – Translate internet message in to SMS message for mobile phones.
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