

SPPU-TE-COMP-CONTENT - KSKA Git

Q1. Explain the specification and functionality of hardware components used RJ-45 connectors, switch, CAT-5 cable, cable tester, crimping tool.

Ans.

1. RJ-45

→ Specifications:-

i) cable category:

- RJ45 connectors are designed to work with specific cable categories, such as ~~EAT~~ Cat5e, Cat6, or Cat6a.

ii) wiring standard:

- It follows 2 wiring standards: T568A and T568B.

iii) Pin config:

- It has 8 pins

iv) Connector type:

- Either STP or UTP

→ Functionality:-

- The 8-pin RJ45 connector is a standardized interface which often connects a computer to a Local Area Network (LAN).

2. Switch

→ Specifications:-

i) Remote monitoring support

ii) MAC and 802.1X based Login

iii) Supplied with latest modular OS

iv) Supports IP-MAC binding

→ Functionality

- A switch is a multipoint bridge with a buffer and a design that can boost its efficiency and performance.

3. CAT-5 cable

→ Specification:-

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- i) Frequency: 100 MHz
 - ii) Attenuation: 24 dB
 - iii) Delay skew: 50 ns
 - iv) characteristic Impedance: $100 \Omega \pm 15$
- Functionality:-
- Category 5 (CAT5) cable is a multi-pair high performance cable that consists of twisted pair conductors, used mainly for data transmission.

4. Cable tester

→ Specifications:-

- i) Capacitance: 60 nF
- ii) USB-C connector socket
- iii) Weight: 150g
- iv) Detection speed: 4 Hz

→ Functionality:-

- Cable testers verify the electrical signals connections on a signal cable - confirming things are wired correctly between ends of the cable.

5. Crimping tool

→ Specifications:-

- i) wire gauge range: 22-10 AWG
- ii) cable types: coaxial, twisted pair, fiber optic
- iii) Hexagonal, insulated terminal, uninsulated terminal dies
- iv) made of durable steel

→ Functionality:-

- A crimping tool is a hand-held device used to join or crimp two pieces of metal by deforming one or both to hold the other.

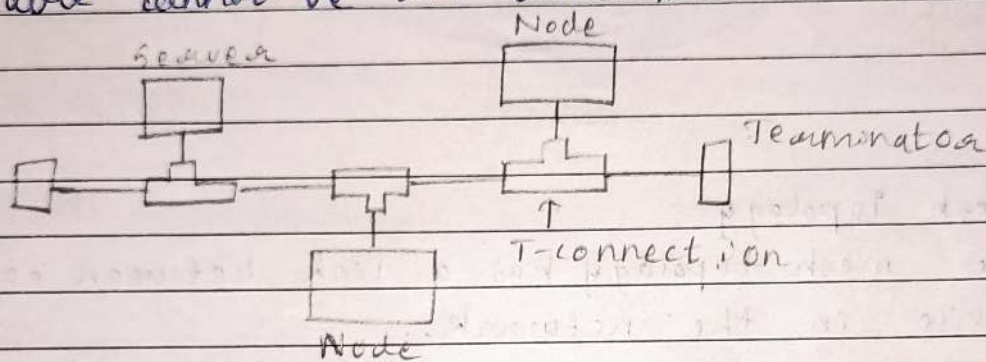
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Q2: what is topology? Explain different types of topologies used for designing network.

Ans.: Topology is also defined as, the manner in which nodes are geometrically arranged and connected is known as the topology of the network.

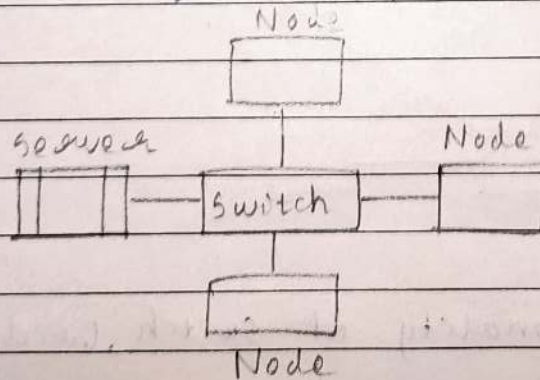
1. Bus Topology

- In bus topology, multiple devices are connected one by one, by means of connectors or drop cables.
- cable cannot be left unterminated in a bus network.



2. Star Topology

- A star topology consists of a number of devices connected by point-to-point links to a central hub.
- Data travels from sender to central hub and then to the receiver.

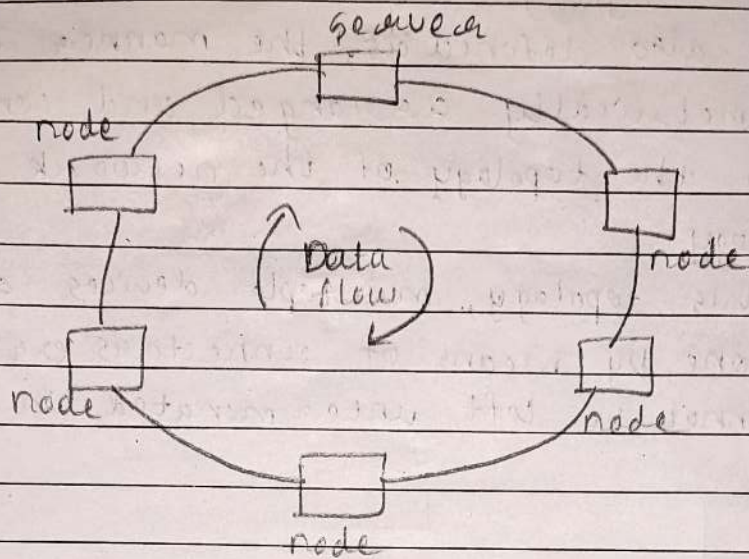


3. Ring Topology

- In a ring topology, each computer is connected to the next computer, and with the last one connected to the first.

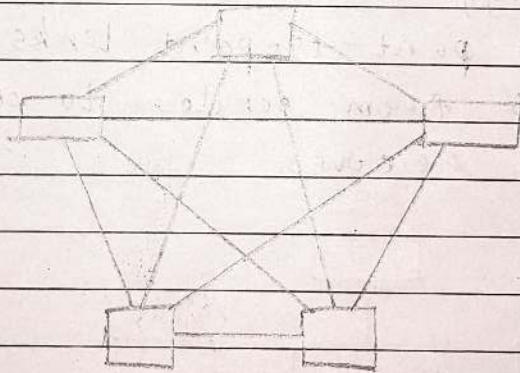
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- The signals travel on the cable in only one direction.



4. Mesh Topology

- The mesh topology has a link between each device in the network.
- Most mesh networks are hybrid mesh networks, which contain some important sites with multiple links.



Q3. Explain functionality of switch, bridge, hub, router, Brouter.

Ans. 1. Switch:-

A switch is a multipoint bridge with a buffer and a design that can boost its efficiency and performance.

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2. Bridge

- A bridge operates at the data link layer.
- A bridge is a repeater, with add on the functionality of filtering content by reading the MAC addresses of the source and destination.

3. Hub

- A hub is a multi-point repeater.
- A hub connects multiple wires coming from different branches, for example, the connector in star topology which connects different stations.

4. Router

- A router is a device like a switch that routes data packets based on their IP addresses.
- The router is mainly a Network layer device.

5. Brouter

- It is also known as the bridging router is a device that combines features of both bridge and router.
- It can work ~~at~~ either at the data link or network layer.

Q4. Write down command to install Wireshark Tool.
Explain importance of Wireshark Tool.

Ans. • Command to install Wireshark tool:

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sudo apt install wireshark
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→ Importance:-

- Wireshark is a free, open-source network analyzer that used for a variety of purposes, including:

1) Troubleshooting:

- Wireshark can help identify the cause of network

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performance issues, such as slow internet connection or lost data packets.

2) Security:

- Wireshark can help detect malicious network activity, identify unauthorized data exfiltration, etc.

3) Analyzing:

- Wireshark can help analyze network protocols and bandwidth usage.

4) Tracing:

- Wireshark can help trace connections and voice over internet (VOIP) calls.

5) Learning:

- Wireshark can help network users learn about specific protocols.