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Objective : To establish all the topology of network.

Tool required : Cisco Packet Trace.

Theory : Network topology refers to the arrangement of nodes (devices). There are several types of network topologies:

1. Bus topology: All devices are connected to a single backbone cable. It is simple & inexpensive but can suffer from a single point of failure.

2. Star Topology: Each device is connected to a central hub or switch. If one connection fails, it doesn't affect the rest of the network, but the central hub can be a single point of failure.

3. Ring Topology: Devices are connected in a circular manner where each devices is connected to exactly two other devices. Data flows in one direction around the ring. Failure of one device can disrupt the entire network.

4. Mesh Topology: Every device is connected to every other devices in the network. It is robust & fault tolerant but expensive & complex to setup

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5. Hybrid Topology: Combines two or more different types of topologies. For example, a network might have a combination of star & mesh topologies to balance cost & performance.

Procedure:

→ Bus Topology:

Step1. Open Cisco packet tracer.
Step2. drag all devices such as PCs and switch.
Step3. Connect all the switches with each other
Step4. connect each switche to a PC and give IP address to it
Step5 Test connectivity between devices.

→ Star Topology

1. Open Cisco packet tracer
2. Drag a switch and some PCs.
3. connect all pCs to switch and give IP address to it
4. Test the connectivity.

→ Ring Topology

1. Start by placing devices on workpace
2. Connect the switch/hub in a circular manner, ~~connect~~ ensure that each switch is connected to exactly 2 devices
3. Connect all switches/hubs to a PC.
4. Give IP address to PCs
5. Test the connectivity.

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4. Mesh Topology:

1. Drag all devices to the workspace
2. Connect each switch to every other device using appropriate cables.
3. Connect PCs to the switches
4. Configure IP addresses to each PC.
5. Test the connectivity.

5. Hybrid Topology.

1. Combine elements from two or more established topologies (mesh, Bus, etc).
2. Perform stimulation to test the connectivity of hybrid network and check its functions as intended.

Result: Successfully established the topologies of network (Bus, star, Ring, Mesh and Hybrid).

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