NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES
CL307 COMPUTER NETWORKS LAB

Packet Tracer

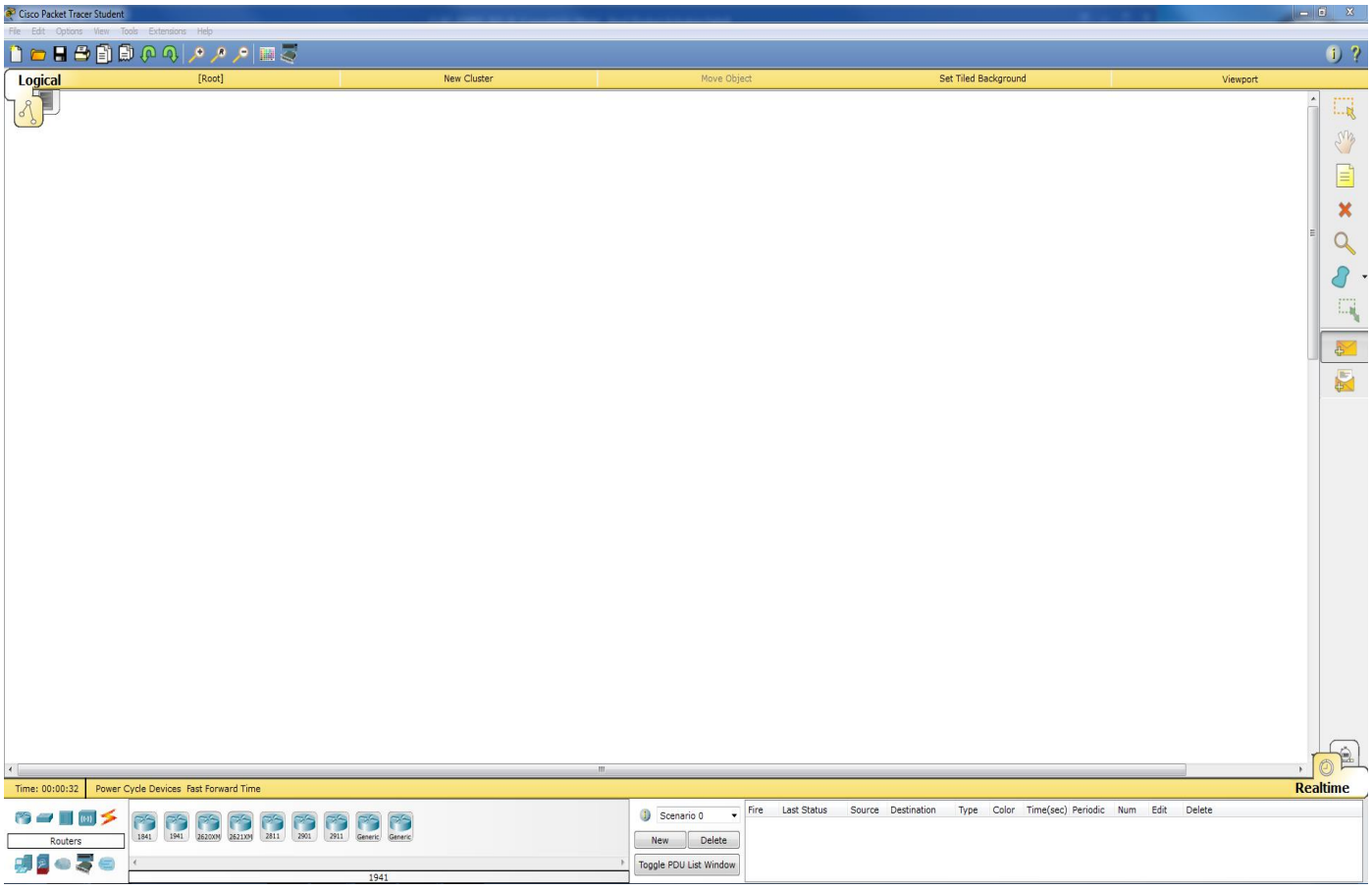
What is Packet Tracer? Packet Tracer is a protocol simulator developed by Dennis Frezzo and his team at Cisco Systems. Packet Tracer (PT) is a powerful and dynamic tool that displays the various protocols used in networking, in either Real Time or Simulation mode. This includes layer 2 protocols such as Ethernet and PPP, layer 3 protocols such as IP, ICMP, and ARP, and layer 4 protocols such as TCP and UDP. Routing protocols can also be traced.

Purpose: The purpose of this lab is to become familiar with building topologies in Packet Tracer.

Requisite knowledge: This lab assumes some understanding of the Ethernet protocol. At this point we have not discussed other protocols, but will use Packet Tracer in later labs to discuss those as well.

Version: This lab is based on Packet Tracer 6.1.

Start Packet Tracer



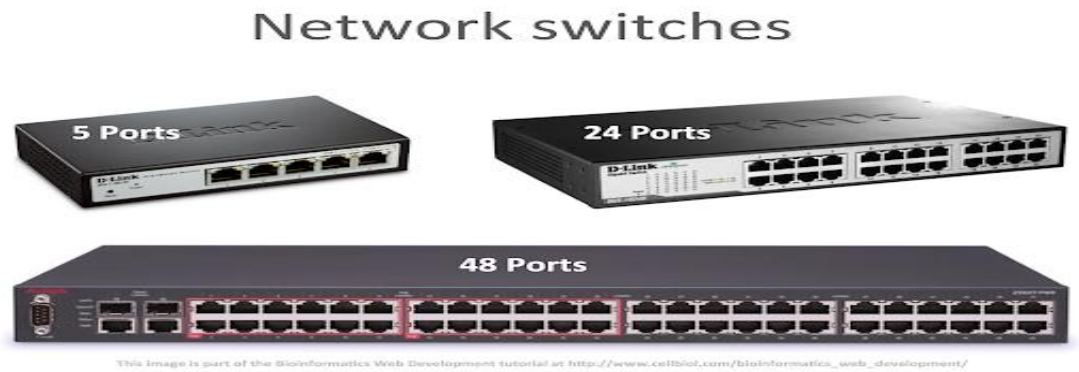
Introduction to Network Devices

What are network devices?The network device is one kind of device used to connect devices or computers together to transfer resources or files like fax machines or printers. Following are the most common examples of network devices:

1. Switch
2. Hub
3. Bridge
4. Router etc.

Switch

Switches are **networking devices** operating at layer 2 or a data link layer of the OSI model. They connect devices in a network and use packet switching to send, receive or forward data packets or data frames over the network. A switch has many ports, to which computers are plugged in.



Hub

A hub is a **networking device** which is used to connect multiple devices in a network. They are generally used to connect computers in a LAN. A computer which intends to be connected to the network is plugged in to one of these ports.

Bridge

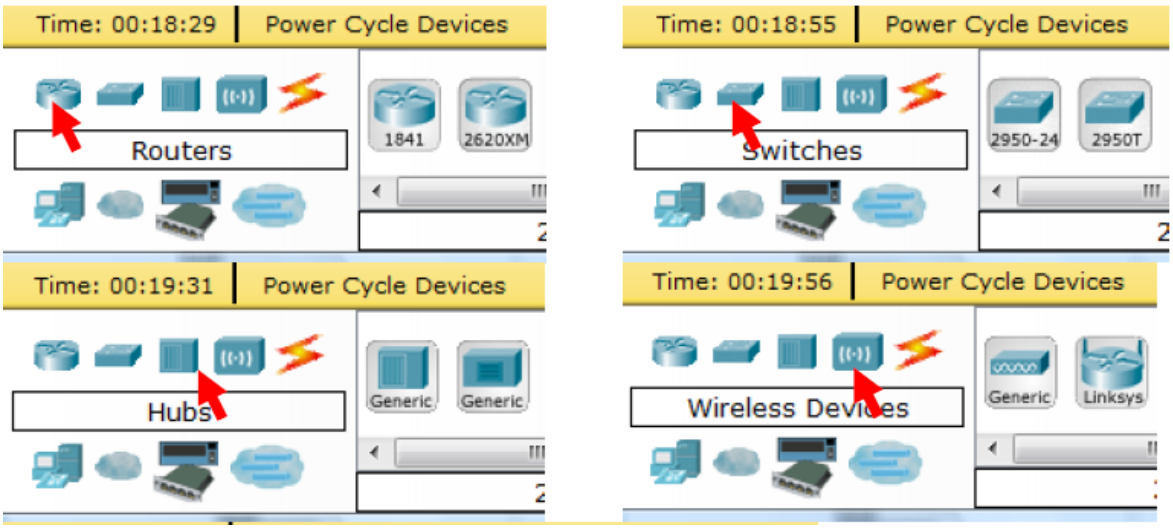
Bridges are **networking** devices that connect networks. Sometimes it is necessary to divide networks into subnets to reduce the amount of traffic on each larger subnet or for security reasons. Once divided, the bridge connects the two subnets and manages the traffic flow between them.

Router

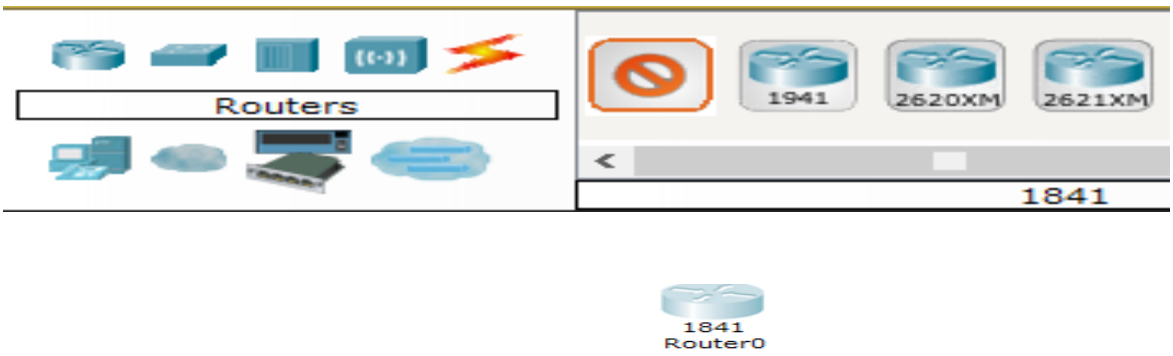
Router receives and sends data on computer networks. Routers are sometimes confused with network hubs, modems, or network switches. However, routers can combine the functions of these components, and connect with these devices, to improve Internet access or help create business networks.

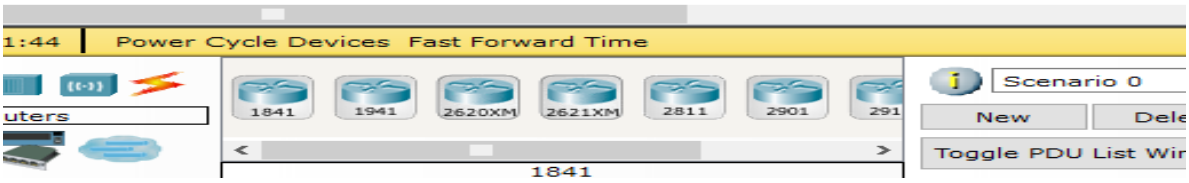
Choosing Network Devices in Cisco Packet Tracer

At the bottom left of packet tracer you will be able to find all network devices which are shown in the form of images:



You can simply click on the network device section select the suitable network device according to your scenario and then click on the white workspace you will get your network device on the screen.





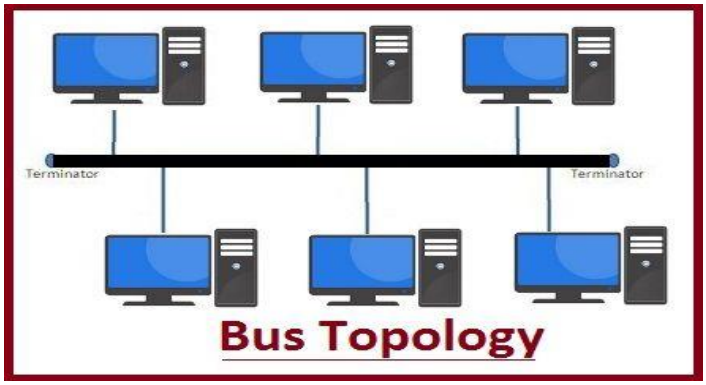
Network Topologies

Network topology refers to the manner in which the links and nodes of a **network** are arranged to relate to each other. A **network topology** diagram helps visualize the communicating devices, which are modeled as nodes, and the connections between the devices, which are modeled as links between the nodes

There are **5 types of network topology**:

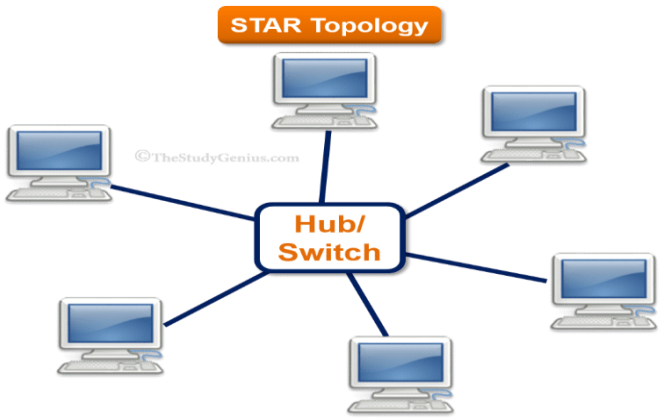
1. Bus Topology

A **bus topology** is a **topology** for a Local Area Network (LAN) in which all the nodes are connected to a single cable. The cable to which the nodes connect is called a "backbone". If the backbone is broken, the entire segment fails. The **bus topology** is used by Ethernet networks



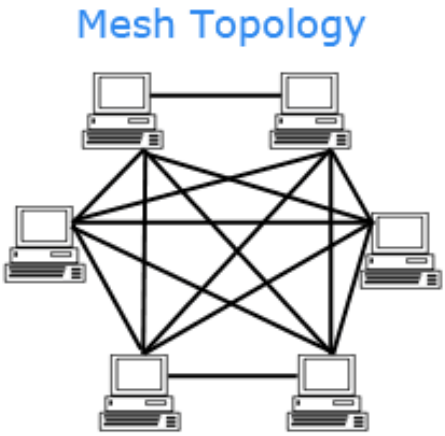
2. Star Topology

A **star topology** is a **topology** for a Local Area Network (LAN) in which all nodes are individually connected to a central connection point, like a hub or a switch. A **star** takes more cable than e.g. a bus, but the benefit is that if a cable fails, only one node will be brought down.



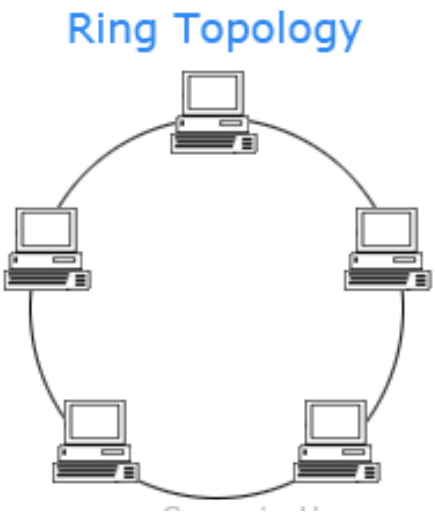
3. Mesh Topology

A **mesh topology** is a network setup where each computer and network device is interconnected with one another. This **topology** setup allows for most transmissions to be distributed even if one of the connections goes down. It is a **topology** commonly used for wireless networks.



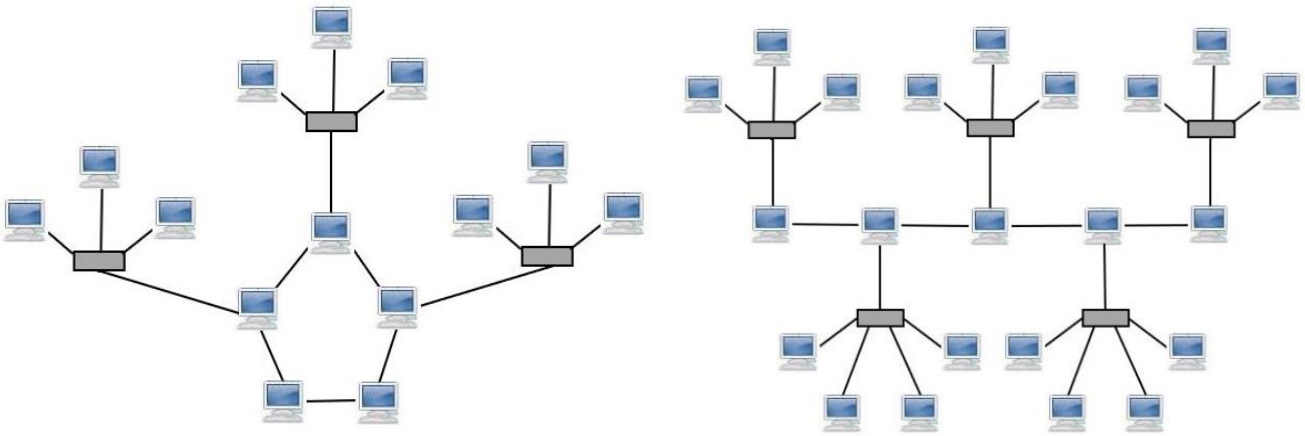
4. Ring Topology

A **ring topology** is a network configuration where device connections create a circular data path. Each networked device is connected to two others, like points on a circle. Together, devices in **ring topology** are referred to as a ring network.



5. Hybrid Topology

A **hybrid topology** is a type of network topology that uses two or more differing network topologies. These topologies can include a mix of bus topology, mesh topology, ring topology, star topology, and tree topology. The hybrid topology can be star-bus or star-ring topology etc.



Let's implement the above topologies using cisco packet tracer!!