LAB # 06: HUB, BRIDGE, and REPEATER CONFIGURATION

# HUB

HUB is a device that is used to interconnect multiple machines to create a network. HUB is considered as **“Multi-port repeater”** that accepts data on one port and broadcast it on rest of the ports it is not an intelligent device and doesn’t care where the data is coming and what its destination is.



**Figure 1.Hub**

In order to make a network using hub, carry out the following steps:

1. Open Packet Tracer
2. Select “HUB” from the list of devices visible at the bottom of packet tracer interface.
3. Below is a screen shot with HUB marked with red.

Graphical user interface, diagram

Description automatically generated with medium confidence

**Figure 2. Select Device**

1. Drag and Drop the HUB on main working area.
2. Now click on the HUB, you will see following image.

A picture containing text, device

Description automatically generated Figure 3: Ports in HUB

1. Here the hub has 6 ports installed with provision of 4 extra ports.
2. You can select and add the ports visible on left of the screen under the title “modules”

Graphical user interface, text, application

Description automatically generated

Figure 4: Modules in HUB

**E** is for Ethernet

**FE** is for Fast Ethernet

**GE** is for Gigabit Ethernet

**FFE** is for Fiber Fast Ethernet

**FGE** is for Fiber Gigabit Ethernet

# BRIDGE

A **network bridge** helps to join two otherwise separate computer networks together to enable communication between them. Bridge devices are used with [local area networks](https://www.lifewire.com/local-area-network-816382) [(LANs)](https://www.lifewire.com/local-area-network-816382) for extending their reach to cover larger physical areas.

Bridge devices inspect incoming network traffic and determine whether to forward or discard it according to its intended destination. An [Ethernet](https://www.lifewire.com/definition-of-ethernet-816312) bridge, for example, inspects each incoming Ethernet frame - including the source and destination [MAC addresses](https://www.lifewire.com/what-is-mac-addressing-817968), and sometimes the frame size - in making individual forwarding decisions. Bridge devices operate at the data link layer (Layer 2) of the [OSI model](https://www.lifewire.com/open-systems-interconnection-model-816290).

## **Types of Network Bridges**

Several different kinds of bridge devices exist, each designed for specific kinds of networks including

* + Wireless bridges - support Wi-Fi [wireless access points](https://www.lifewire.com/wireless-access-point-816545)
  + Wi-Fi Ethernet bridges - allows connecting Ethernet clients and interfacing them to a local Wi-Fi network, useful for older network devices that lack Wi-Fi capability

## **Bridges vs. Switches and Routers**

In wired computer networks, bridges serve a similar function as [network switches](https://www.lifewire.com/definition-of-network-switch-817588). Traditional wired bridges support one incoming and one outgoing network

connection (accessible through a [hardware port](https://www.lifewire.com/computer-port-usage-817366)), whereas switches usually offer four or more hardware ports. Switches are sometimes called *multi-port bridges* for this reason.

Likewise, bridges lack the intelligence of [network routers](https://www.lifewire.com/how-routers-work-816456): Bridges do not understand the concept of remote networks and cannot redirect messages to different locations dynamically but instead support only one outside interface.

# 3.REPEATER

Network **repeaters** regenerate incoming electrical, wireless or optical signals. With physical media like [Ethernet](https://www.lifewire.com/definition-of-ethernet-816312) or [Wi-Fi,](https://www.lifewire.com/what-is-wifi-816557) data transmissions can only span a limited distance before the quality of the signal degrades. Repeaters attempt to preserve signal integrity and extend the distance over which data can safely travel.

Actual [network devices](https://www.lifewire.com/how-computer-networks-work-817372) that serve as repeaters usually have some other name.

**Active hubs**, for example, are repeaters. Active hubs are sometimes also called "multiport repeaters," but more commonly they are just "[hubs](https://www.lifewire.com/ethernet-and-network-hubs-816358)." Other types of "passive hubs" are not repeaters. In Wi-Fi, [access points](https://www.lifewire.com/wireless-access-point-816545) function as repeaters only when operating in so-called "repeater mode."

Higher-level devices in the [OSI model](https://www.lifewire.com/open-systems-interconnection-model-816290) like [switches](https://www.lifewire.com/definition-of-network-switch-817588) and [routers](https://www.lifewire.com/how-routers-work-816456) generally do not incorporate the functions of a repeater. All repeaters are technically OSI physical layer devices.

## **Bridges vs. Repeaters**

Bridge and [network repeater](https://www.lifewire.com/definition-of-repeater-816359) devices share a similar physical appearance; sometimes, a single unit performs both functions. Unlike bridges, however, repeaters do not perform any traffic filtering and do not join two networks together but instead pass along all traffic they receive. Repeaters serve primarily to regenerate traffic signals so that a single network can reach longer physical distances.

**Lab Tasks**

1. Create a network using Packet Tracer having eight PC with 4 of them in one broadcast domain and remaining 4 in other broadcast domain achieve this by using HUB and Bridge.

[HINT: HUB has single Broadcast and collision domain; broadcast domain mean all devices connected will receive data of every transaction, USE 2 HUB and 1 Bridge having 8 PCs in Network] show steps in form of screen shots also explain the working of bridge.

Diagram

Description automatically generated

1. Solve the following IP Address exercises:

Change the following IP address from binary notation to dotted-decimal notation. 10000001 00001011 00001011 11101111

Change the following IP address from dotted-decimal notation to binary notation: 111.56.45.78