**Lab Practical #03:**

Study of different network devices in detail.

**Practical Assignment #03:**

1. Give difference between below network devices.

* Hub and Switch
* Switch and Router
* Router and Gateway

1. Working of below network devices:
   * Switch
   * Router
   * Gateway

# Hub and Switch

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| --- | --- | --- |
| No. | Hub | Switch |
| 1 | A hub is a networking device that connects multiple PCs to a single network. | A Switch connects multiple devices on a single computer network. |
| 2 | A Hub is slower than a switch. | A switch is much faster than a hub |
| 3 | Hub is operated on Physical layer. | Switch is operated on Data link layer. |
| 4 | In this packet filtering is not available. | In this packet filtering is available. |
|  |  |  |
| 5 | Hub is not an intelligent device that sends message to all ports hence it is comparatively inexpensive. | While switch is an intelligent device that sends message to selected destination so it is expensive. |

# Switch and Router

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| --- | --- | --- |
| No. | Switch | Router |
| 1 | A switch connects multiple devices to create a network. | A router connects multiple switches. |
| 2 | Switch works in data link layer. | It works in network layer. |
| 3 | Switch needs at least single network is to connect. | Router needs at least two networks to connect. |
| 4 | Switch is an expensive device than hub. but cheaper than router. | Router is a relatively much more expensive device than switch. |
| 5 | There is no collision taking place in full duplex switch. | There is less collision taking place in the router. |

# Router and Gateway

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| --- | --- | --- |
| No. | Router | Gateway |
| 1 | A router routes various data packets via a similar set of networks. | A gateway acts as a connection between two very dissimilar networks. |
| 2 | It is capable of dynamic routing. | It is not capable of dynamic routing. |
| 3 | The OSI model's layer 3 and layer 4 are used by routers. | The OSI model's layer 5 is where a gateway functions. |
| 4 | It is only available in specialized applications. | Dedicated apps, physical servers, or virtual applications are used to host it. |
| 5 | It routes the data packets via similar networks. | It connects two dissimilar networks. |

# Working of below network devices:

1. Switch : Switches are key building blocks for any network. They connect multiple devices, such as computers, wireless access points, printers, and servers; on the same network within a building or campus. A switch enables connected devices to share information and talk to each other.
2. Router : Consider a router as an air traffic controller, and consider data packets as planes flying to various airports (or networks). Each packet must be directed as quickly as possible to its destination, just as each plane has a distinct destination and travels a distinct route. A router assists in guiding data packets to their intended IP address.
3. Gateway : It is a point of a network that can access other networks. Usually, in the intranet, a router or node can act as a gateway node or the router that links the networks are called gateways. In large scale enterprises, the computers manage the traffic between enterprise networks are termed as gateway nodes. Such as that the computers used by Internet service providers to link varied users to each other at an instant time to the internet are gateway nodes. In any development team of any commercial enterprise computer server functions as gateway nodes and it may also be a proxy server or a firewall at times.