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REG NO. & NAME OF STUDENT	20TUCS221 & SIVA RANJANI. K.
SEMESTER & YEAR OF STUDY	V SEM & III YEAR
COURSE NO. & NAME OF LABORATORY COURSE	20CS502 - COMPUTER NETWORK LAB
EXPERIMENT NO.	02
TITLE OF EXPERIMENT	STUDY OF VARIOUS NETWORKING INTERMEDIATE DEVICES
DATE OF EXPERIMENT	: 08/08/2022

EVALUATION BY FACULTY MEMBER (BASED ON RUBRICS)

CRITERIA	MAXIMUM MARKS	MARKS SCORED BY STUDENT
BACKGROUND THEORY (PRE LAB)	20	20
PROCEDURE (EXECUTION)	40	40
DISCUSSION (EXECUTION)	20	20
CONCLUSION&VIVAVOCE (POST LAB)	20	8
TOTAL MARKS	100	88

EXPERIMENT OBJECTIVE: To study about the various networking intermediate devices.

REQUIREMENTS FOR EXPERIMENT EXECUTION

S NO.	ITEM/SOFTWARETOOLS DESCRIPTION WITH SPECIFICATION	QUANTITY

EX NO:2	STUDY OF VARIOUS NETWORKING INTERMEDIATE DEVICES

AIM:

To study about the various networking intermediate devices.

BACKGROUND THEORY:

When two or more computers and network components are connected to each other for sharing data and resource through any communication channel, that is called Network or Computer Network or Data Network.

Whereas the entire process of connecting and linking two or more computers and networking devices with each other is called Networking. We need various Hardware, software and network components to create a computer network. The network can be either wired or wireless.

COMPONENTS OF COMPUTER NETWORK :

TRANSMISSION MEDIA:

Transmission media are the medium through which data is transferred from one device to another in a network. It can be used either in a physical transmission medium or wireless transmission medium. Physical transmission medium includes the use of wires and cables like fiber optic cables, coaxial cable etc.; and wireless transmission medium includes the use of unguided media like infra-red waves, electromagnetic, microwaves, etc.

NETWORK INTERFACE CARDS:

Network interface cards (NICs) are also called Network Interface Controller, Network adapter, LAN adapter and Physical Network Interface. NIC are hardware components used to connect computers with networks. Without NIC a computer can't be connected to the network. The network interface is built directly into motherboard in almost all new computers.

There are two types of NIC

* Internal Network Card (wired NIC)

* External Network Card (wireless NIC)

HUB :

A hub is a device that splits a network connection among multiple computers. It works similarly to a distribution center. When a computer requests information from one network or from a specific computer, then It sends the requests to the hub through a cable. The hub then receives that request and transmits it to the entire network. After that, every computer checks whether that network then belongs to them or not. If belongs then it broadcasts if the request doesn't belong it will be dropped.

However, such network components nowadays are very less in circulation and being replaced by more advanced communication devices such as routers & switches. This hub is basically a multiport repeater. This hub is used to connect multiple connections that come from different branches.

SWITCH :

The switch is a component that helps devices to connect the networks so that they can transfer data to other connected devices. These network switches are identical to network hubs, but a switch has more advanced features than a hub. It doesn't broadcast entire data on the network like a hub.

The advanced features of the switch imply that the network switch first inspects the incoming packet and determines its source, destination address, and routes after that sends the data at the correct destination accordingly to the packet. A network switch is also called the switching hub, bridging hub and MAC bridge.

ROUTER :

The router is a hardware network component. Routers operate at the network layer of the OSI reference model, using them to send packets over the network using a logical address.

Any data which travels from one network to another network as a packet. The router receives such packet data and forwards it to the destination device after analyzing hidden information in the data packet. This networking device is used to connect different networks either it is wired or wireless.

There are two main types of routers

* Broadband Routers
* Wireless Routers.

MODEM :

The full form of the modem is Modulator/ Demodulator. The process of converting a digital signal into an analog signal is called modulation. These components allow a computer device, such as router or switch, to connect to the internet.

It converts or "modulates" an analog signal from a telephone or cable wire into a digital signal that a router or switch can easily recognize the data.

Similarly, when it converts outgoing digital data into an analog signal in a computer device converting is called Demodulation. The speed of transmitting data by modem is modifiable. This speed of transfer is measured in bytes per second rate. The faster its speed, the faster one can send and receive information.

There are basically three types of modem

* External modem
* Internal modem
* Wireless modem

REPEATER:

A repeater is a powerful network components that is used to regenerate signals. With this, the signal is fixed for a long time, so that the strength of the signal remains stable.

Repeater takes data signals from the communication medium and amplifies them and sends them back to the communication medium.

When the signal becomes weak, this device copies the signal bit by bit and then regenerates it to its original strength for making the Internet connection stable.

A repeater is located in the first layer of the OSI layer. Repeaters are used in cables that have to cover distances of up to 100 meters. These components receive signals from cables like optical fibers, coaxial cables and copper cables.

BRIDGES:

This bridge is a device that has such functionality that it filters the content, for which it reads MAC addresses of both source and destination. The bridge connects two LANs using the same protocol. This device operates in the data link layer of the OSI layer.

These network components are very useful for filtering the data load of traffic, for which they divide them into segments or packets. The bridge

controls the data traffic of LANs or other networks. These bridges are actually passive devices, as there is no interaction between bridged and paths of bridging.

GATEWAY:

This gateway is a hardware device that acts as a "gate" within two networks. It can also be a router, firewall or any other device that enables traffic to flow in and out of the network. Gateways are used to connect networks based on different protocols. As a bridge is used to join two similar types of networks, similarly the gateway is used to join two dissimilar networks.

This gateway node is located at the edge of the network and all the data flows through it which enters or exists the network. In addition, it can also translate received data that is received from outside networks, into a format or protocol that can be identified by devices within the internal network.

CONCLUSION:

Thus the functionalities and the purpose of various components in networking is understood clearly and studied successfully.