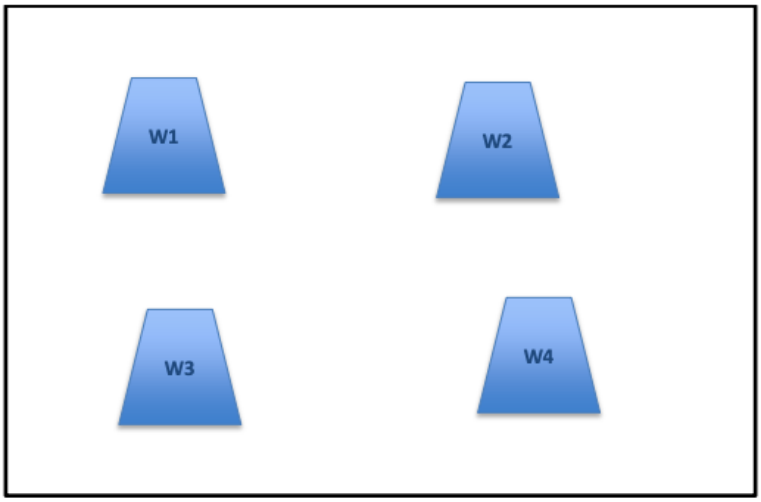
Subject: Informatics Practices (065)
Topic: Introduction to Computer Networks
Subject Instructor: Mr. Prabhat Das (PGT-IP) | Army Public School Jorhat
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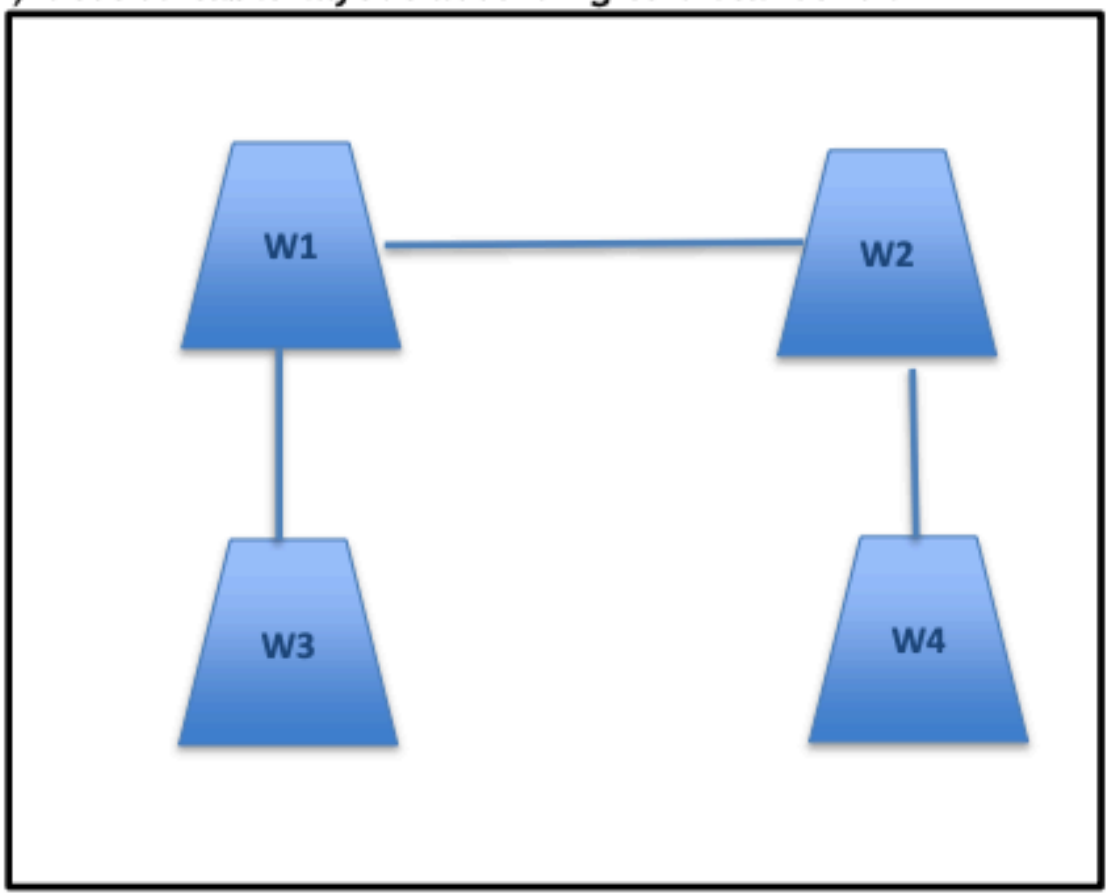
Q1: A company in Mega Enterprises has 4 wings of buildings as shown in the diagram :



Center to center distances between various Buildings:
W3 to W1 - 50m
W1 to W2 - 60m
W2 to W4 - 25m
W4 to W3 - 170m
W3 to W2 - 125m
W1 to w4 - 90m
Number of computers in each of the wing:
W1 - 150
W2 - 15
W3 - 15
W4 - 25
Computers in each wing are networked but wings are not networked The company has now decided to connect the wings also.
i. Suggest a most suitable cable layout for the above connections.
ii. Suggest the most appropriate topology of the connection between the wings.
iii. The company wants internet accessibility in all the wings. Suggest a suitable technology .
iv. Suggest the placement of the following devices with justification if the company wants minimized network traffic
a)Repeater
b)Hub / switch
v. The company is planning to link its head office situated in New Delhi with the offices in hilly areas. Suggest a way to connect it economically.

Ans:

i) Most suitable layout according to distance is :



1 mark for an appropriate cable layout

ii) Star Topology

1 mark for correct topology

iii) Broadband.

1 mark for suggesting suitable technology

iv). a. Not required. Repeaters may be skipped as per above layout (because distance is less than 100 m)

b. In every wing

½ mark for placement of repeater ½ mark for placement of hub / switch

iv) Radio Waves

1 mark for the appropriate connectivity mode between HQ and other offices

Q2: International Tour and Travels company has set up its new branch office in Jaipur where different buildings are spanned over in the radius of 900 meter in Jaipur. Name the network formed in the following situations :

(i) The branch office is connected with the regional office in New Delhi.

(ii) All the buildings of branch office are connected to each other.

Ans:

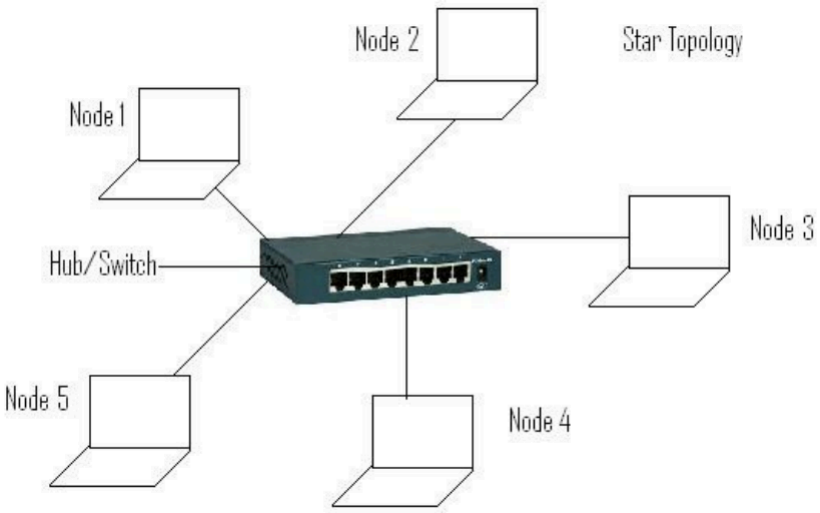
(i) WAN (ii) LAN (½ Mark for each correct answer)

Q3: Ms. Ivana, a leading marketing professional working in a multinational company, is most of the time on move to cater her profession demands. Although she carries her laptop with her all the time but many a times she require to take some data from her office PC. She has to make several requesting phone calls to her colleague Ms. Barbara to send her required documents from her office PC. Suggest her any one popular software name so that she can herself remotely access her office PC anytime from anywhere.



Ans: Team Viewer / Any Desk

Q4: Identify the topology shown below. Write 2 advantages of this topology.



Ans:
Star Topology Two advantages are as follows:
1. Easy to install
2. Easy to diagnose the fault

Q5: MCQS

Q1: Two devices are in network if:
a) a process in one device is able to exchange information with a process in another device
b) a process is running on both devices
c) the processes running of different devices are of same type
d) none of the mentioned

Q2: What is a stand-alone computer ?
a) A computer that is not connected to a network
b) A computer that is being used as a server
c) A computer that does not have any peripherals attached to it
d) A computer that is used by only one person

Q3: Central Computer which is powerful than other computers in the network is called as:
a) Server
b) Hub
c) Switch
d) Client

Q4: Which of these components is internal to a computer and is required to connect the computer to a network ?
a) Network Interface card
b) Wireless Access Point
c) Hub
d) Switch

Q5: Hub is a
a) Unicast device
b) Broadcast device
c) None of the above
d) Multicast device

Q6: Switch is a
a) Unicast device
b) Broadcast device
c) None of the above
d) Multicast device

Q7: The device that can operate in place of a hub is a:
a) Bridge
b) Router
c) Switch
d) Gateway

Q8: A repeater takes a weak and corrupted signal and it:
a) Regenerates
b) Amplifies
c) Reroutes
d) Resembles

Q9: Which network topology requires a central controller or hub?
a) Star
b) Mesh
c) Bus
d) Tree

Q10: Which topology requires a multipoint connection on a single cable?
a) Star
b) Bus
c) Mesh
d) Tree

Q11: Which of the following topologies contains a backbone cable running through the whole length of the network ?
a) Star
b) Bus
c) Mesh
d) Tree

Q12: Which of the following devices can be used at the centre of a star topology?

a) Hub
b) Router
c) Repeater
d) Modem

Q13: If a computer connected to a star topology fails, the entire network will:
a) also fail
b) work unaffectedly
c) only server will work
d) none of these

Q14: A combination of bus and star topologies is called a_____topology.
a) Combination
b) Tree
c) Mesh
d) Hybrid

Q15: Internet is an example of_____topology.
a) Mesh
b) Star
c) Bus
d) Tree

Q16: Data is converted in a form so as to travel over telephone lines using this device.

a) Modem
b) Switch
c) Hub
d) Router

Q17: Network device that regenerates and retransmits the whole signal is:

a) Repeater
b) Modem
c) Hub
d) Bridge

Q18: Network device which connects networks of similar types (same protocols):

a) Bridge
b) Router
c) Hub
d) Gateway

Q19: Network device which connects dissimilar networks (different protocols).

a) Router
b) Bridge
c) Gateway
d) Hub

Q20: Networks devices that sends the data over optimizing paths through connected hops is:

a) Router
b) Bridge
c) Hub
d) Gateway

Q6: What is a network? Why is it needed ?
OR
Mention one advantage of networking.

Ans: A network is an interconnected collection of autonomous computers that can share and exchange information. Major reasons that emphasize on the need of networks are :

a. **Resource Sharing:** Through a network, data, software and hardware resources can be shared irrespective of the physical location of the resources and the user.
b. **Reliability:** A file can have its copies on two or more computers of the network, so if one of them is unavailable, the other copies could be used. That makes a network more reliable.
c. **Reduced Costs.** Since resources can be shared, it greatly reduces the costs.
d. **Fast communication:** With networks, it is possible to exchange information at very fast speeds.

Q7: What are the different types of networking/internetworking devices ?

Ans: Different types of networking/internetworking devices are

a. Repeater. Also called a regenerator, it is an electronic device that operates only at physical layer. It receives the signal in the network before it becomes weak, regenerates the original bit pattern and puts the refreshed copy back in to the link.
b. Bridges. These operate both in the physical and data link layers of LANS of same type. They divide a larger network in to smaller segments. They contain logic that allow them to keep the traffic for each segment separate and thus are repeaters that relay a frame only the side of the segment containing the intended recipient and control congestion.
c. Routers. They relay packets among multiple interconnected networks (i.e., LANS of different type). They operate in the physical, data link and network layers. They contain software that enable them to determine which of the several possible paths is the best for a particular transmission.
d. Gateways. They relay packets among networks that have different protocols (e.8, between a LAN and a WAN). They accept a packet formatted for one protocol and convert it to a packet formatted for another protocol before forwarding it. They operate in all seven layers of the OSÍ model.

Q8: What is the difference between Hub, Switch, and Router?

Ans:
HUB: Hub is the least expensive, least intelligent and least complicated of the three. It broadcasts all data to every port which may cause serious security and reliability concern.
In a Network Hub is a common connection point for devices connected to the network. Hub network contains multiple ports and is used to connect segments of LAN.

SWITCH: Switches work similarly like Hubs but in a more efficient manner. It creates connections dynamically and provides information only to the requesting port.
Switch is a device in a network which forwards packets in a network.

ROUTER: The router is smartest and most complicated out of these three. It comes in all shapes and sizes. Routers are similar like little computers dedicated for routing network traffic. Routers are located at gateway and forwards data packets.

Q9: What are two types of modems ?

Ans:
a. Internal Modem: Are the modems that are fixed within the computer.
b. External Modem: Are the modems that are connected externally to a computer as other peripherals are connected.