

Computer Networks Basics and Network Topology

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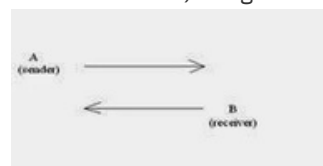
Computer network is an important chapter from exam point of view. This particular piece is my effort towards making this chapter a bearable one for you.

Given in point wise format, these are the points you should know from this chapter, the bare minimum and the absolute essential. Do not go to the exams without these! And as for the maximum knowledge – well, sky is the limit, my friend!

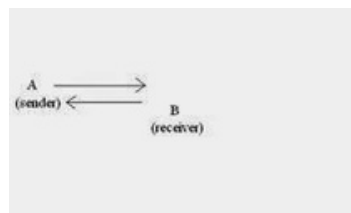
So we start:

○ Computer Networks

1. **Computer Network** is for aiding 'Data Communication', i.e., sending and receiving of data between terminals situated at different places.
2. There are 3 types of '**Transmission Channels**', namely, *Simplex*, *Half Duplex* and *Full Duplex Channels*.
3. A(sender) à B(receiver) : is the **simplex channel**, where data transmission is in one way direction. Here the receiver can not send any communication back to the sender via the same channel.
4. **Half Duplex channel** – where the transmission of data is from both ends, but at any particular time only one is happening, either incoming or outgoing transmission. The diagram bellow shows a gap in space between the sender and receiver messages, to denote the gap in time where at one time only one message (either form the sender or from the receiver) will get transmitted.



5. **Full Duplex channel**, is where the data gets transmitted in both directions at the same time, i.e., there is no time lag or delay in communication.



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○ Network Topology

6. There are 4 main types of 'Network Topology', namely, *Mesh*, *Star*, *Ring* and *Bus*

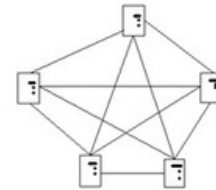
Network.

7. **Topology** means the arrangement of various components of a network (such as server/hubs/nodes/links/information flow channels etc.), and depicts the structure of a network.

8. The following diagrammatic representation is of '**Mesh Networking**' – the small rectangular boxes are 'Nodes'.

In mesh network, each node is independent, and is used for high traffic transmission through multiple available routes. This is a fully connected network, where each node in the network is connected to every other node.

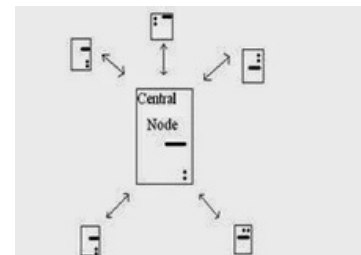
As you can see in the diagram, each node is connected to the other four, which is why this type of network is highly reliable for data transmission as there are more than one route for transmission.



Plus if a particular route fails – then the transmission can automatically switch to other available routes and the transmission will be successfully completed.

9. In '**Star Network**', there is a '**Central Node**', which is also called the '**Hub**'. For your easy understanding, think of hub as a Server and the other nodes attached to it are the client nodes.

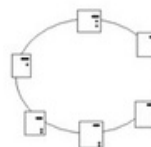
The communication between the clients takes place through the server. A client (sender) sends information to the hub, the hub then transmits the information to the client (receiver) for whom the information was meant to be transmitted.



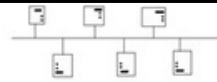
In this type of network, if the transmission line between the hub and a node fails, then that node will become isolated from the network.

And if the central node fails, then the whole network fails!

10. In '**Ring Network**' topology, each node is connected to two other nodes only. The data flow is usually one way in a ring network, and hence if any line/node fails then the entire network crumbles.



11. '**Bus Network**' is the type of topology in which the nodes are connected by a single communication line. This single communication line is called a **bus**.



The bus networks are the simplest of networks, but it has a critical drawback. It can transmit from one node at a time, because of the single line of communication.

12. **Node** is a connection point where data transmission originates or ends.

○ Network Terminals

13. **Terminal** is a computer network means a computer equipment, it could be anything – a computer, an ATM machine, the PNR and Train time requesting machines at railway stations.

14. **Dumb Terminals** are those terminals which cannot do any processing or storage of data. It is simply an input/output device wired into another computer. It takes the input, transmits the data to the computer (computers can process!) to which it is connected and then displays the output.

Examples: Like PNR status checking booth at Railway stations. They have a Cathode Ray Tube (Screen), a Keyboard, or screen with touch input and gives the output on the screen.

15. **Intelligent Terminals** is the kind of terminal which can do its own processing... which would mean it is fitted with a processor and has memory (storage) capacity and thus is actually a computer (but not the kind which looks like our PC!)

16. **Smart Terminals** have processing capacities and memory too, but lesser than intelligent terminals.

So the hierarchy would be (lowest to highest) – Dumb – Smart – Intelligent Terminals.

There you go guys computer network and its absolute basics – hope this was helpful!

Have a good day. Keep learning and keep sharing!