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Course: Computer Networks

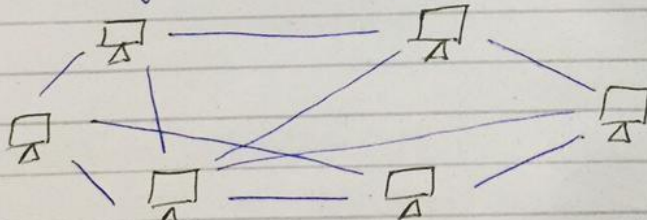
Class Activity # 02:-

1) Decentralized Networks:

Decentralized
Networks are further classified into:

⇒ Structured Networks:

In structured
Networks, connections are properly
structured. They are organized for
allowing searching efficiently.



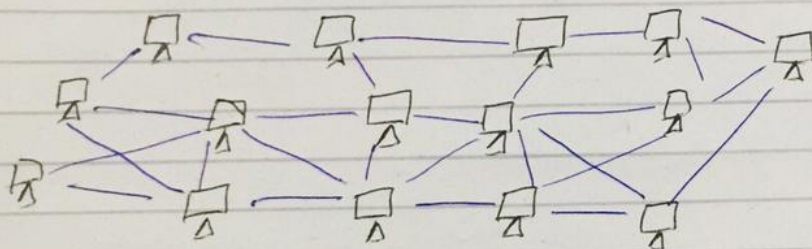
structured peer to peer Networks

Example:-

A DHT (Distributed Hash Table) is
a common example of structured peer to
peer networks.

=> Unstructured Networks:

In unstructured Network, there is no proper structure. This is nice and simple, but doesn't scale particularly well. The main problem being that you have to search the entire network to find something.



Example:

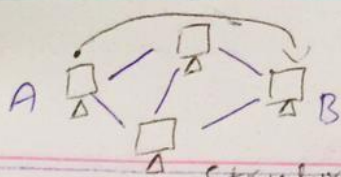
Gnutella, Freenet etc.

=> Which one is better?

Structured peer to peer Network is more better than unstructured because:

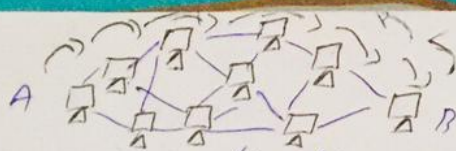
- Searching is efficient.
- Proper structure.
- Less traffic.

Example:- if A want to communicate with B, then it is easily send request and communicate with B because



Structured

(direct communicate)



(sending requests)
Slow process

of peer to peer structured and there is a direct link between them while if we are on unstructured network, we have to first send request to our neighbours and then so on.

2) Peer to Peer Networks topology:- We can use both topologies in peer to peer network:

⇒ Mesh topology:

We can use Mesh topology for peer to peer Networks. In Mesh, we used to organize nodes into a network that can transmit data between nodes.

⇒ Ring topology:

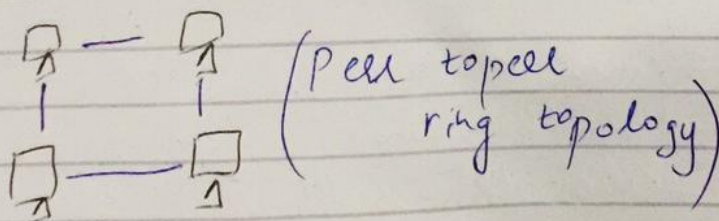
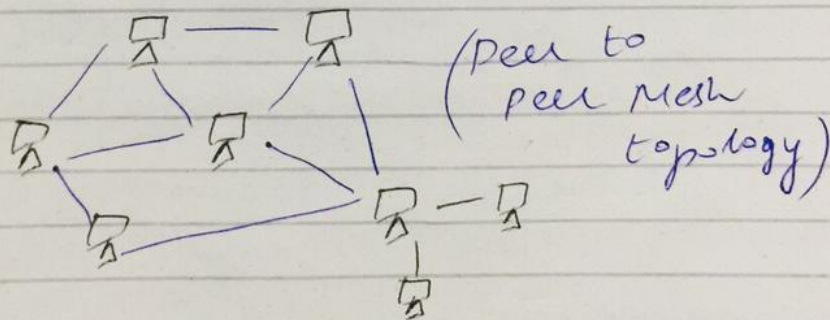
We can also use ring topology for peer to peer Networks.

• Better:- Mesh topology is better in peer to peer Networks because In peer to peer, no server is include and our communication is direct peer to peer and

In mesh topology, all nodes are connected to each other. So when we use mesh, our peer to peer network is established and our communication is direct.

- Each node is peer to peer network function as a router. This allows you to directly addressing node to which you are not directly connected but intermediate nodes will pass the message along it reaches the targeted node.

Example:- Tor, CORDS etc.



3) Bit-torrent:

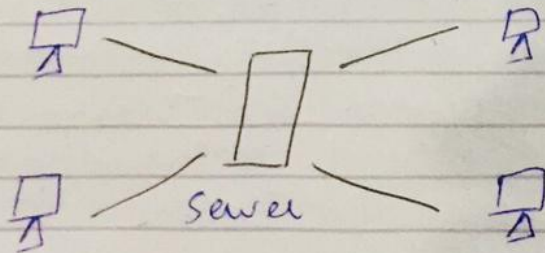
BitTorrent is a communication protocol for peer to peer file sharing, which enables user to distribute data over internet in a decentralized manner.

It is designed for fast, efficient content distribution.

Example: movies, DVDs, Iso's etc.

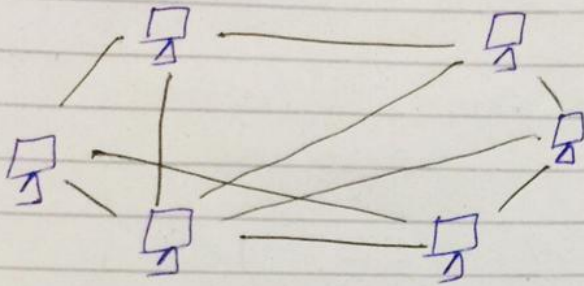
Working:

When you download a webpage, your computer connects to web server & downloads data directly from server. Each computer that downloads the data downloads it from web page central server. This is how traffic controls.



Bit torrent is peer to peer protocol, which means computers in bit torrent "swarm".

Swarm means (a group of computers downloading and uploading the same torrent) transfer data between each other without need of central server.



Traditionally, a computer joins bit torrent swarm by loading .torrent file into a bit torrent file.

Torrent Trackers & Trackless:

⇒ A decentralized trackless torrent system allows bit torrent clients to communicate among each other without any central server. Bit torrent clients used DHT technology for this, with each bit torrent client functionality as a DHT node. When you add a magnetic link, the DHT node contact nearby nodes and locate the information.

⇒ In effect each peer becomes a "trunk".
This means that Bit torrent clients no longer need a central server managing a swarm. It becomes a fully decentralized peer to peer file system transfer.

* Leechers & Seeders:

Users downloading from a bit torrent swarm are commonly referred as leechers or peers.

Users that remain connected to bit torrent swarm even after downloading the complete file, contributing more of their upload bandwidth so other people can continue to download file, are referred as "seeders".