**Network Topology**

Network topology is a picture of planning in connecting computers to each other to form a network computer. There are several types of topologies are commonly found in computers on the network connection local area network, such as:

1. *Bus topology*

Bus Topology is the second stretch of the cable along the cable ends are closed where there are nodes. In bus topology used a single cable or wiring center where all workstations and servers are connected. Also, it is the physical topology using coaxial cable using T-Connector and 50 ohm terminator on the end of the network.



**Picture. Bus Topology**

Bus Topology Advantages are:

1. Save cables.
2. Layout simple cable.
3. Cost.
4. Installation is simple.
5. No need Hub / Switch.
6. Development of new network or adding workstations, can be done easily without disturbing other workstations.

Bus Topology weaknesses are:

1. Detection and isolation of errors is very small.
2. Density of traffic on the main line.
3. If there is a disruption in the center of the cable along the whole network will crash.
4. Required repeater for long distance.
5. There is often a hang or crass talk, that is, if more than one pair to wear at the same point, then take turns or plus relays.
6. It has a 2-way signal with one cable, the possibility of collision (collision mixing data or data) is very large, if there is broken or loose on one connector then the whole network will stop, check the cable that broke will take a long time because it had to be done one by one .
7. *Topology Ring*

Is a network topology in the form of a closed loop containing node - the node. Signal flow in both directions so as to avoid the collision and movement of data very quickly, so that the information and data are transmitted in one direction to form a closed loop so impressive ring without end.

Each workstation or server will receive and pass information from one computer to another, if the addresses of the specified the information received and if no information will be passed. In Ring Topology, each station (computer) may be repeaters (transceivers) that serves as:

1. Listen State, each bit is sent back to the experience of time delay.
2. Transmit State, if the bits that come from larger packages of Ring the repeater will return to sender. If there is a packet in the Ring, the central repeater transmits, receives bits of packets sent must accommodate and retransmit.
3. Bypass State, serves to eliminate the time delay of the station is not active.



**Picture. Topology Ring**

*Excess Topology Ring, are:*

1. Not the collision (collision data or mixing data) as the bus topology.
2. Layout simple installation.
3. No need Hub / Switch.
4. Connection failure due to interference with the media, can be overcome by other lines that are still connected.
5. The use of a point-to-point makes transmission error can be minimized.

*Ring Topology weaknesses are:*

1. Each node in the network will always follow and manage the information that is passed in the network, so that when there is a disturbance in a node the whole network is disrupted.

2. If there is broken or loose on one connector then the whole network will stop, check cable drop will take a long time because it had to be done one by one.

3. When the data is sent over multiple computers, data transfer is slow.

1. *Topology Star*

Is a node (station) to communicate directly with others via the central node station (HUB / Switch). Taffic data flow from node to node and forwarded to the central node (station) purposes. If one of the cables are disconnected, the other networks will not be interrupted.



**Picture. Topology Star**

Star Topology Advantages are:

1. That the existence of a separate cable for each workstation to the server, the bandwidth or communication bandwidth in the cable will be wide so that it will enhance the overall network performance.

2. If there is a disruption in the cable line disturbances will occur only in the communication between the workstation concerned with the server, the network as a whole is not impaired.

3. Access to the other station (client or server) fast.

4. Can accept new workstation for the port in the central node (HUB / Switch) available.

5. HUB / Switch acts as a concentrator.

6. HUB / Switch can be set series (rise) to increase the number of stations that are connected in the network.

7. Users can more than bus or ring topologies.

8. Most flexible.

9. Installation / changing station is very easy and does not interfere with other parts of the network.

10. Ease of detection and fault isolation / damage management network.

11. Security level is high.

12. Resistant to busy network traffic.

Star Topology weaknesses are:

1. The need for larger cable than other topologies.

2. When the data traffic is quite high and the collision occurred, then all communication will be delayed, and the connection will be continued or welcome with random manner, if the HUB / Switch detects no path that is being used by another node.

3. Need special handling.

4. Centralized control (HUB) be the critical element.

5. Additional cost because it requires a Hub / Switch as the central node (the central node).

6. If the node was damaged, then the whole network is interrupted.

1. *Hybrid Topology*

Hybrid topology is the topology combination or combinations of the two or more other network topologies, which can combine the performance of several different topologies, either different systems or different transmission media.

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**Picture. Hybrid Topology**

*Hybrid Topology Advantages are:*

1. One of the prominent advantages of this topology is its flexibility. This topology is designed, so that it can be applied to a number of different network environments.
2. Adding to connect other devices easily, because the new nodes and peripherals can be connected to the topology and topology can be associated with hybrid topology easily.
3. When a particular link in the network is broken, it does not affect the network.
4. It is easier to isolate the different topologies are connected to each other and find fault with Hybrid Topology
5. Topology consistent speed, because it combines the strengths of each topology and eliminate weaknesses.

*Hybrid Topology weaknesses are:*

1. Because different topologies come together in a Hybrid Topology, topology management becomes difficult.
2. The cost of this topology is higher compared to other topologies.
3. Installation and configuration topology is difficult.
4. *Tree or Hierarchical topology (hierarchy)*

Not all stations have equal footing. Station master a higher position underneath the station, so the network depends on the station a higher position and the position of the same station is called peer topology. Built by Extended Star Topology as a sub-nodes are connected through a single central node. This topology can support both baseband and broadband signaling as well as to support either contention or token bus access.

**Picture. Tree or Hierarchical topology**

*Excess Tree or Hierarchical topology (hierarchy), are:*

1. Management control is easier because it is centralized and is divided into stage levels.
2. Easy to develop.
3. Powered by hardware and software from multiple companies.

*Weakness Tree or Hierarchical topology (hierarchy), are:*

1. If one node is damaged, then the node is present at the bottom will be damaged.
2. Data files can be a collision (collision).
3. More difficult to configure and install the cable than other topologies
4. *Full Mesh Topology and Connected*

Network topology is implemented fully antrsenal relationship. The number of channels that must be provided to form a mesh network is a central number minus 1 (n-1, n = number of central). Topology constructed by placing a link between the station-station. Typically, in order to amplify the signal transmitted data transmission, in the middle - the middle (area) between the blank computer device placed radio (water point) that serves as repeaters to amplify the signal at a time can set the direction of data communications.

A 'fully-connected mesh' network where each terminal is connected directly to all the other terminals. Typically used on small computer network. This topology has a high level of redundancy. So if there is a link that is broken so a station can find the other link.

**Picture. Full Mesh Topology and Connected**

Pros and Full Mesh Topology Connected, is:

1. Using wireless technology, this topology is very possible to be realized (because you can bet there will be no wires attached so numerous and complicated).
2. The main advantage of using this topology is fault tolerance.
3. Ensuring the communication channel capacity, because it has excess connections.
4. Relatively easy to do troubleshoot.

Weaknesses and Full Mesh Topology Connected, is:

1. The complexity of the network is proportional to the increase in the number of centrally

installed.

1. Less economical also relatively expensive to operate.
2. Is a specialized technology (add hock) that can not be made ​​with the wiring, because the system is complex.
3. The difficulty at the time of installation and reconfiguration when the number of computers and devices connected in increasing numbers.
4. Costs to maintain a surplus.
5. *Plex Network (Network Combination)*

Network is truly interactive, where each node has the ability to directly access not only to computers but also with other devices or nodes. In general, these networks have a shape similar to a star network. Organizations use data de-centralization, is to perform maintenance, use centralized facilities.

**Picture. Plex Network**

Plex Advantage Network, is:

1. Have the ability to directly access Meng-not only for computers, but also with other

equipment or knot.

1. Low usage cost and simple installation process.

Plex weakness Network, is:

1. To connection a little slow, cuz need to share every client.
2. Because different topologies come together in a Plex Network Topology, topology management becomes difficult.

Logical topologies are generally divided into two types, namely:

1. Simply Broadcast topology can be described that is a host that sends the data to all other hosts on the network media.
2. Token Passing topology arrange to send data on the host through the media by using the token rotates on a regular basis throughout the host. Host only send data only if a host is a token. By this token, collision can be prevented.
3. *Topology POINT to POINT (Point to-Point)*

Point to point networking is the most simple networks but can be used widely. Similarly, the network medium, so often not considered as a network but only a regular communication. In this case, the second node has a single position, so that any node can initiate and handle relationships in the network. Data is transmitted from one node directly kesimpul other as receiver, for example between the terminal with CPU.

1. *Topology WIRELESS*

This topology is the latest topology used. This topology is used in conjunction with other topologies and no physical connection.



**Picture. Topology Wireless**

Excess Topology Wireless, are:

1. Diselenggara easy operation.
2. Can be accessed by the client / user.
3. Without using cables.

Weakness Topology Wireless, are:

1. Speed ​​of access is low, because they have to share the connection.
2. There is often a broken connection.