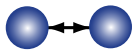
Theory and Terminology

Point to Point Networks

In a point-to-point network, nodes are connected in a line with a cable between each node.

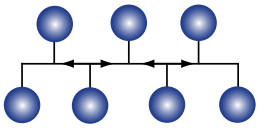


Pros—Simple networking used to establish a permanent link between two points.

Cons—Network communication stops with a single link failure, and chattering results in network failure.

Bus Networks

In a bus network, the nodes are connected using a common communication path, called a bus.

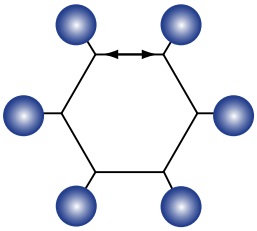


Pros—Devices are easy to connect to the bus.

Cons— Network communication stops with a bus failure or chattering; and total network response time increases when nodes are added to the bus.

Ring Networks

Ring networks are similar to bus networks except the common cable is looped into a continuous ring.

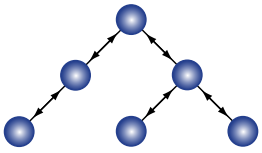


Pros—The signal can reverse direction when a link fails.

Cons—Communication relies on one cable; the total network response time increases when nodes are added to the bus; and chattering results in network failure.

Tree Networks

In a tree network, the lowest level contains the nodes, referred to as leaves, whose only function is to transmit information to the next highest level, the repeaters. The repeaters forward the data to the gateway.

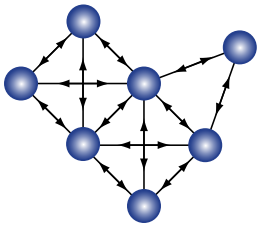


Pros—New nodes added to the system do not slow down the entire network.

Cons—A repeater failure cuts off the nodes from the gateway; there are no redundant communication links between network components; and chattering brings down an entire network branch.

Mesh Networks

In a mesh network, each node has some routing capabilities and maintains a network connection with at least two other nodes.

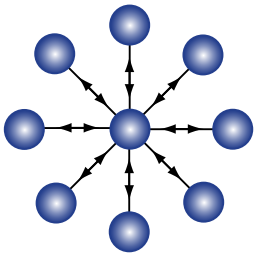


Pros—Information has multiple communication paths to the gateway; the gateway can be positioned anywhere in the network; and chattering nodes are removed from the network.

Cons—A new node adds multiple connections to the other nodes and substantially slows the entire network.

Star Networks

In a star network, the gateway is in the center with radiating spokes outward to the nodes. Because of its shape, this network is also referred to as a hub and spoke network.



Pros—The gateway maintains a communications connection with each node on a separate communications path; if communication between one node and the gateway fails, the rest of the network is unaffected; and chattering nodes are removed from the network.

Cons—The network suffers from some speed decreases with each additional node added; and a hub failure stops network communications.