Let's Talk About Networking

Networking can seem very complicated and overwhelming, especially if you're not a network admin. We understand that and are here to help you get more comfortable with networking products so that you can find exactly what you need for your office.

Types of Equipment

Switches

- A network device that connects devices together on a network by using packet switching to receive, process, and forward data to the destination device.
- These send and receive data to devices connected. They do not route the data unless the switch has Layer 3 functionality.
- Switches can be either managed or unmanaged. Unmanaged switches have fixed configurations and features, where managed switches give more control over traffic and access to more features.

Router

- A network device that forwards data packets between computer networks.
- Routers perform the traffic directing functions.

Access Point

- A network device that allows a wi-fi device to connect to a wired network.
- Wireless Access Points (WAP) and Access Points (AP) can be used as a bridge for networks to distribute connections as well as power over ethernet (POE).

Wireless LAN (WLAN) Controler

- Is used to fully manage, configure, and secure wireless access points in large quantities.
- Can be a physical appliance or cloud integration.

Gateway

- A network router or node equipped for interfacing with another network that uses different protocols.
- Gateways can be hardware devices that act as "gates" between networks with router and firewall functionality to enable and route traffic flow.

Security

- A system designed to prevent unauthorized access to or from a network.
- Firewalls are hardware, software, or a combination.
- Firewalls define the criteria by which data packets can be safely routed through a given network.

Types of Networks

Local-Area (LAN)

- Computers are geographically close together (ex: being in the same building).

Wide-Area (WAN)

- The computers are farther apart and are connected by telephone lines or radio waves.
- The computers are typically in different locations.

Campus-Area (CAN)

- The computers are within a limited geographic area, such as a university campus or airport.

Metropolitan-Area (MAN)

- A data network designed for a town or city.

Home-Area (HAN)

- A network contained within a user's home, often only connecting a person/families devices.

Virtual LAN (VLAN)

- A network of computers that behave as if they are connected to the same wire even though they may actually be physically located on different segments of a LAN.
- VLANs are configured through software rather than hardware.

Virtual Private Network (VPN)

- A VPN extends a private network across a public network and enables users to send and receive data across shared or public networks as if their computing devices were directly connected to the private network.

Enterprise Private Network (EPN)

- A computer network built by a business to interconnect its various company sites.

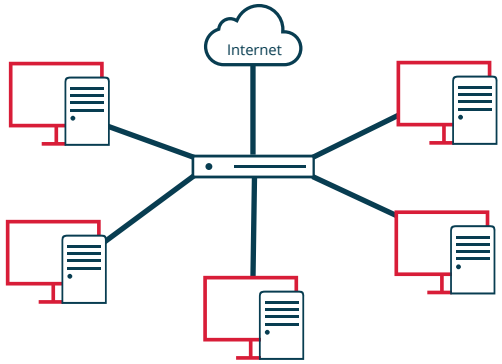
System-Area Network (SAN)

- A network designed for high-speed interconnection in cluster environments (server to server), multiprocessing systems (processor to processor), and SANs (storage area networks).

POLAN

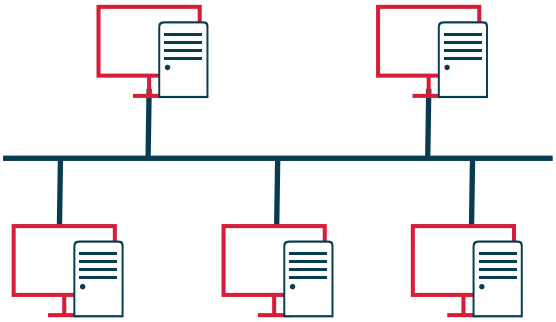
- A point-to-multipoint LAN architecture, POLAN uses optical splitters to split an optical signal from one strand of single mode optical fiber into multiple signals to serve users and devices.

Types of Topologies



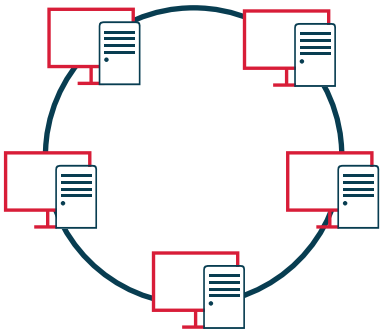
Star

- Computers connected to a central point with a single connection. If the central point goes down everything loses connection.



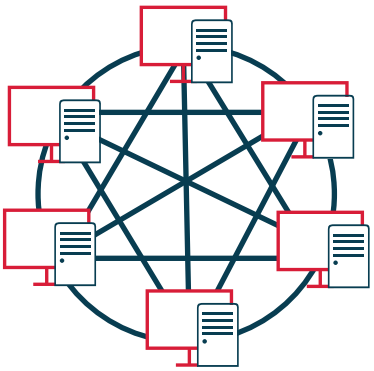
Bus

- Single connection that all computers attach to in a line. Ethernet systems use bus topologies.



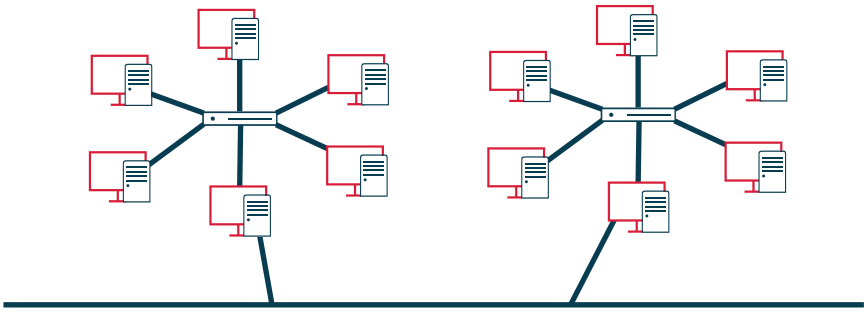
Ring

- All computers connected together in a circle (ring). If a connection goes down the ring is broken.



Mesh

- Every location is connected to every other location with multiple connections. That way if one connection goes down there are always other connections to rely on. Highly redundant topology.



Tree

- A hybrid network topology in which star networks are interconnected via bus networks.

Network Layers

This is the Open Source Interconnection (OSI) 7 Layer Model

Layer	Application		Devices & Protocols			DOD4 Model
Application (7)	End user layer Program that opens what was sent or creates what is to be sent		**User Application** SMTP		GATEWAY	Process
Presentation (6)	Syntax layer - encrypt & decrypt Formats the data to be presented to the application layer - can be viewed as the "translator" for the network		JPEG/ASCII EBDIC/TIFF/GIF PICT			
Session (5)	Synch and send to ports Allows session establishment between processes running on different stations		**Logical ports** RPC/SQL/NFS NetBIOS names			
Transport (4)	TCP - Host to Host, Flow Control Ensures that messages are delivered in sequence and with no losses	Packet Filtering	TCP/SPX/UDP			Host to Host
Network (3)	Packets (contains IP address) Decides which physical path the data takes		**Routers** IP/IPX/ICMP			Internet
Data Link (2)	Frames, transfer of data from one node to another node over the physical layer		**Switches** **Bridge** **WAP** PPP/SLIP	Land Based Layers		Network
Physical (1)	The physical equipment and wires • cables, hubs, etc.		**Hub**			

We Can Help

Aventis Systems carries a full range of networking solutions from the top brands. Choose from Cisco, Meraki, Dell, HP, and Juniper networking product. You can also contact us to get a custom quote to fit your environment.