

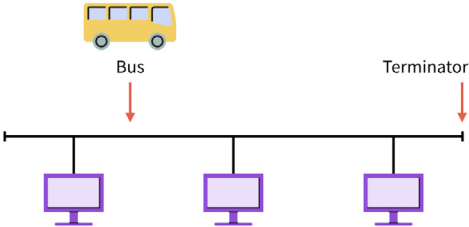
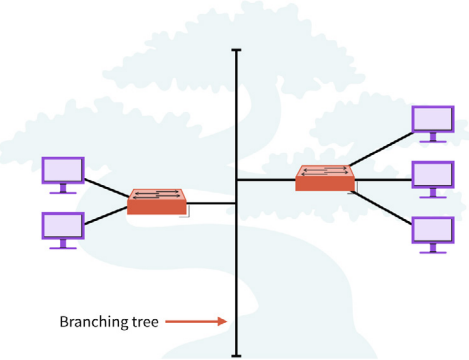
Links

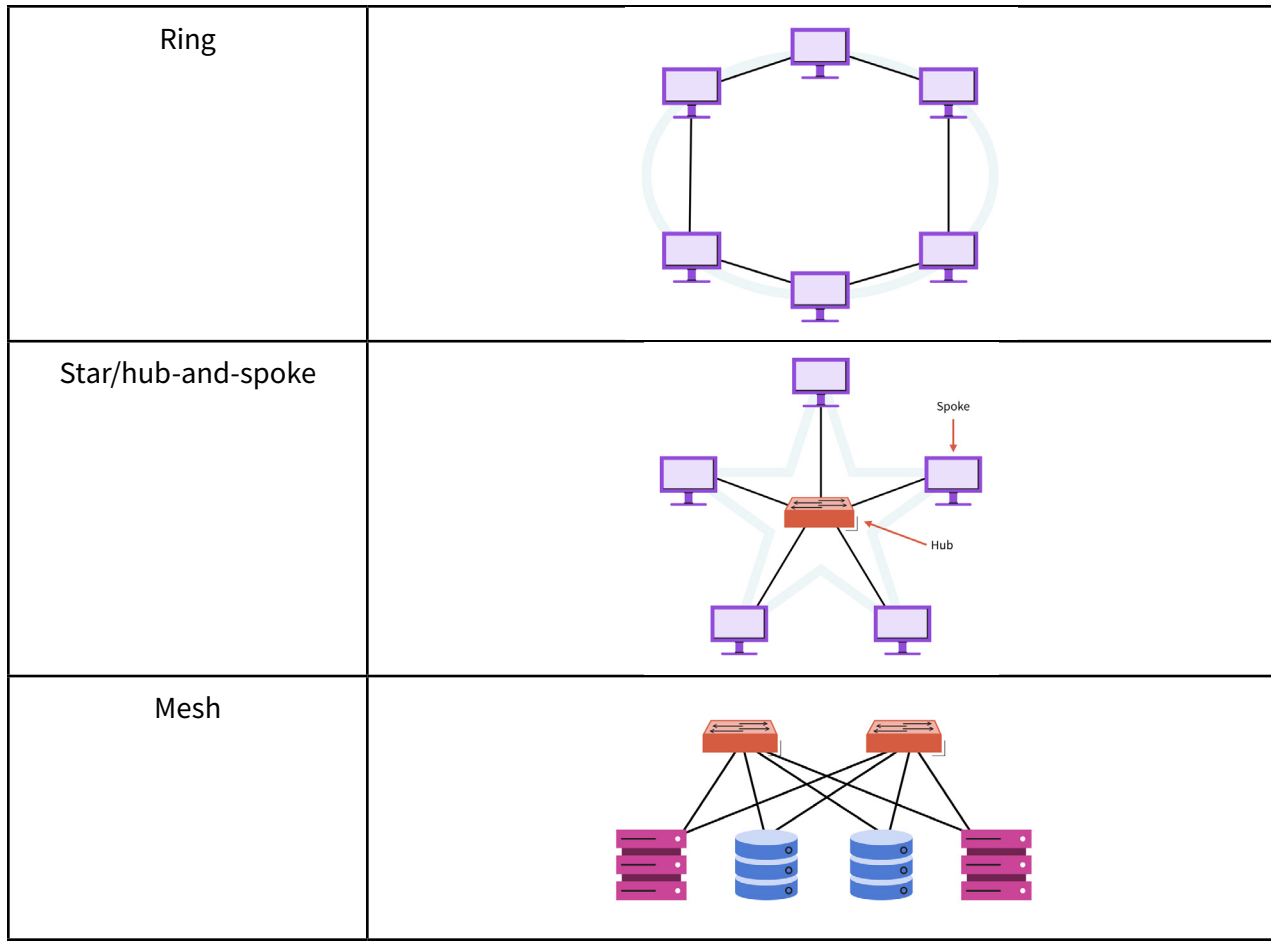
- TP-Link emulator – [TP-link.com/au/support/emulator/](https://www.tp-link.com/au/support/emulator/)
- Learning DNS course – <https://www.linkedin.com/learning/learning-dns>
- Firewall Administration Essential Training course – <https://www.linkedin.com/learning/firewall-administration-essential-training-24372798>

Considerations for Selecting LAN Network Devices

- Cost – this may be affected by brand, supported features, and the number of interfaces
- Reliability – check the build of the device and features like redundant power supply or redundant fans
- Scalability – based on capacity planning, consider the number of ports/interfaces, port speed, and Power over Ethernet (PoE) support
- Speed – this refers to port speed and forwarding rate
- Power – some devices support PoE, which is typically used to power wireless access points, IP phones, and/or security cameras

LAN Topologies

Topology	
Bus	
Tree	



Ethernet

- Refers to a family of networking technologies defined in the IEEE 802.2 and 802.3 standards
- De facto standard for wired local area networks (LANs)

Ethernet Frame

Preamble	Destination MAC Address	Source MAC Address	Type/Length	Data	Frame Check Sequence
8 bytes	6 bytes	6 bytes	2 bytes	45–1,500 bytes	4 bytes

Ethernet Standards



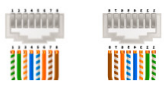
Coaxial Cable	Twisted-Pair Cable	Fiber Optic Cable
10Base2	1000Base-T	1000Base-SX
10Base5	10GBase-T	1000Base-LX
	40GBase-T	1000Base-RHx
	100GBase-T	And more

Comparing media types





Ethernet Cables

	CAT5	CAT5e	CAT6	CAT6a
Max Speed	100 Mbps	1 Gbps	10 Gbps	10 Gbps
Max Frequency	100 MHz	100 MHz	250 MHz	500 MHz
Common Use	10Base-T/ 100Base-T	1000Base-T	10GBase-T	10GBase-T

Ethernet Configurations

Type of Cable	Configuration	Uses
Straight-through		<ul style="list-style-type: none"> ◆ PC-switch ◆ Switch-router
Cross-connect/crossover		<ul style="list-style-type: none"> ◆ PC-PC ◆ Switch-switch ◆ Router-router ◆ PC-router
Rollover/console		<ul style="list-style-type: none"> ◆ To console port, for the configuration and management of network devices

Various Connectors for Fiber Optic Cables

Connector Type	Coupling Type	Picture
Subscriber connector (SC)	<ul style="list-style-type: none">• Push-pull with a locking tab	
Lucent connector (LC)	<ul style="list-style-type: none">• Push-pull with a latch• Similar to SC but smaller	
Ferrule connector (FC)	<ul style="list-style-type: none">• Screw-on mechanism	
Straight-tip (ST) connector	<ul style="list-style-type: none">• Bayonet-style mechanism• Twist on	

Wi-Fi Standards (IEEE 802.11)

IEEE Standard	Generation	Frequency (GHz)			Max Link Rate
802.11be	Wi-Fi 7	2.4	5	6	23 Gbps
802.11ax	Wi-Fi 6E	2.4	5	6	9.6 Gbps
	Wi-Fi 6	2.4	5		
802.11ac	Wi-Fi 5		5		6.9 Gbps
802.11n	Wi-Fi 4	2.4	5		23 Gbps
802.11g		2.4			54 Mbps
802.11a			5		54 Mbps
802.11b		2.4			11 Mbps