→ RS-232 standard for serial communication
ex → Rollover or console.

→ IEEE 802.3 standard for ethernet
ex twisted pairs, fiber optic, coaxial cables.

→ ATM used fiber or twisted
Token ring fibers

→ Fusion splices is used to repair fiber optic cable

→ optical link budget → is a calculation that considers all the anticipated losses along the length of a fiber optic connection.

→ signal losses in fiber optic
Reasons :- distance of the cable, imperfect connections, patches, or splice along the fiber optic cable, bends in the cable

POP 110 over SSL 995
IMAP 143 over SSL 993

(5) classful and classless protocol

RIPV1

classful
based on Hops
broadcast its IP address

RIPV2

through multicast
classless protocol
Authentication to protect data
only support 15 hops or fewer

IGRP

created by CISCO
uses RIP function
support Hops upto 100
distance vector and classful protocol

EIGRP

created by CISCO
allowed hop upto 255.
distance, classless IGP

OSPF

link state, IGP, classless
OSPF uses dijkstra to recalculate pathways

EGP

EGP protocol, useful for exchanging data or information between different gateway

IS - IS

link-state, IGP, classless used to send and share routing information

BGP

types of exterior gateway protocol

uses best path selection for performing data packet transfer, making it distinct directed protocol as well.

To determine best route, it references

1. path length
2. origin type
3. Routers IDs
4. Neighbour IP

IGRP

DHCP snooping
→ IP tracking on a layer 2 device
→ switch notices for DHCP conversations
- filters invalid IP
- device acting DHCP servers

TOOLS

cable stripper → used to remove outer sheath or insulation from the copper cable such as UTP, STP or coaxial cable

cable snip or cable cutter → used to cut copper cable into smaller length.

cable crimper → used to join internal wires of a twisted pair cable.

punchdown tool → is used to insert wires into insulation displacement connectors on patch panel, keystone module or punchdown block

cable tester → used to verify the electrical connections in a twisted pair or coaxial cable.

Loop prevention

1

Layer 3 on Router

Split horizon → is a method of preventing routing loops in distance-vector routing protocol by prohibiting a router from advertising a route back onto the interface from which it was learned.

Layer 3 router

Route poisioning → is a method to prevent a routes from sending packets through a route that has become invalid within computer network. This is achieved by changing the route's metrics to a value that exceeds the maximum allowaye hop count so that the route is advertised as unreachable

Layer 3 on router

Hold down timers → is a function of a route that prevents a router from being updated for specific length of time

Layer 2

STP → prevent bridge loops and broadcast radiation that results from them

Network Hardening

* Route Advisement Guard - IPV6
→ IPV6 includes periodic routes announcement
→ A Rouge device could pretend to be a router - part of man path attack, denial of service
→ switches can validate the RA message

* port security
→ prevent unauthorized users from connecting to switch interface.

* Dynamic ARP Inspection
- stops arp poisoning at the switch level
- Relies on DHCP shooping

* Control plane policing
- protect against DoS or reconnaissance
- Filter QOS
- Block unnecessary control plane traffic

* port Isolation
→ Restrict access between interfaces

ERRORS codes

CRC (cyclic redundancy checksum)
→ is an error-detecting code commonly used in digital network and storage devices to detect accidental changes to raw data as it transits the network

CRC number - failed CRC checksum ~~packet~~ num of packet

10G Base - SR - For MMF

1000Base - LR
1000Base - FX - for SMF

S is not single.

→ L2TP → Layer 2 Tunneling protocol is tunneling protocol used to support virtual private networks or as part of the delivery of services by ISPs.