

Q) Explain Cisco Wireless Technology.

- Cisco wireless networking Combines the mobility of wireless with the performance of wired networks, offering a dramatic performance ~~and~~ ~~comparative~~ increase compared to legacy 802.11a/g networks.
- Improve the end-user experience on legacy and cutting edge wireless device with industry-leading performance and Advanced technology from Cisco.

2) List of IEEE Standard.

IEEE 802 - Use for the overview and architecture of LAN/MAN.

IEEE 802.1 - Use for bridging and management of LAN/MAN.

IEEE 802.1s - Use for multiple spanning trees.

IEEE 802.1.W - Use for rapid reconfiguration of spanning trees.

IEEE 802.1x - used for network access control of ports.

IEEE 802.2 - used in Logical Link Control (LLC)

IEEE 802.3 - used in Ethernet (CSMA/CD access method)

IEEE 802.3ae - used for 10 gigabit Ethernet.

IEEE 802.4 - used for token passing bus access methods and the Physical layer specifications.

IEEE 802.5 - used for token Passing bus access methods and the Physical layer Specification.

IEEE 802.6 - used in distributed queue Dual bus (DQDB) access method and for the Physical layer specification (MAN).

IEEE 802.7 - used in broadband LAN.

IEEE 802.8 - used fibre optics

IEEE 802.9 - used isochronous LANs.

IEEE 802.10 - used in interoperable LAN/MAN security.

IEEE 802.11 - Used in Wireless LAN, MAC and Physical layer Specification.

IEEE 802.12 - Used in the demand-priority access method, in the Physical layer and in IEEE 802.11 Specification.

IEEE 802.13 - Not used.

IEEE 802.14 - used in Cable modems.

IEEE 802.15 - used in WPAN (Wireless Personal Area Network).

IEEE 802.16 - It is used in Wireless MAN.

IEEE 802.17 - Used in RPR access.
(Resilient packet Ring).

3) Explain Wireless Topologies.

→ The 802.11 standard identifies two main wireless topology modes:

- Infrastructure mode.
- Independent Basic Service set (IBSS).
(ad hoc mode)

→ With the ubiquity of wireless networks, mesh topologies are now common.

Infrastructure Mode:

With infrastructure mode, wireless clients interconnect via an AP. The configuration of the APs to share the same SSID allows wireless clients to roam between BSAs.

IBSS, or Ad Hoc Mode

- In the 802.11 standard, Independent Basic Service (IBSS) is defined as two devices connected wirelessly in a Peer-to-Peer manner without the use of an AP.
- IBSS allows two devices to communicate directly without the need for any other wireless devices.
- 4) Explain Wireless Security Protocol and Encryption method Type.
- Wireless Security protocol use encryption technology to secure networks. They protect the data of their clients.
- Wireless network are often less secure than wired.

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- Wireless Security protocols are crucial for keeping you safe online.

Encryption method type.

- Wired Equivalent Privacy protocol (WEP)
- Wi-Fi Protected Access protocol (WPA)
- WiFi protected Access 2 protocol (WPA2)
- WiFi Protected Access 3 protocol (WPA3)

5) What is ACL ? Type of ACL and Example of Extended ACL.

- Access-list is a set of rules defined for controlling network traffic and reducing network attacks.
- ACLs are used to filter traffic based on the set of rules defined for the incoming or outgoing of the network.

There are two main different types of Access-list.

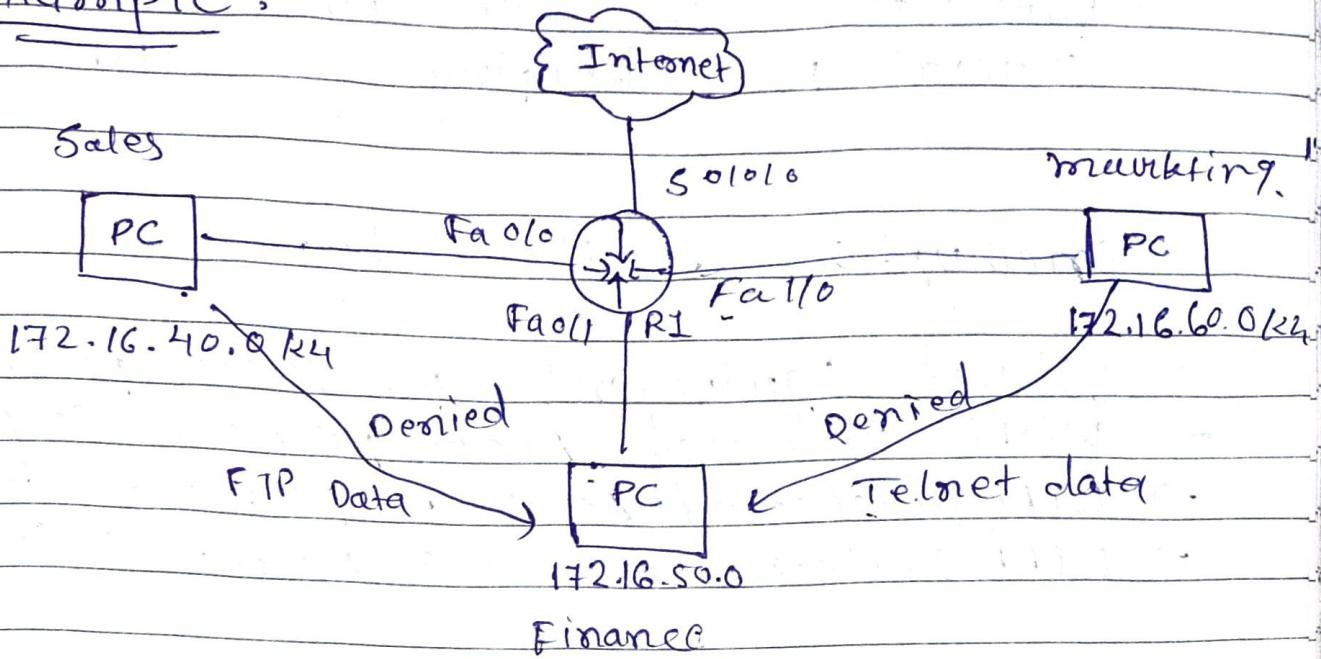
1. Standard Access-list
2. Extended Access-list.

- a. Numbered access list
- b. Named Access list

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Example :-



RI # Conf t

RI (conf t) # access-list 110

RI (conf t) # deny tcp 172.16.40.0 0.0.0.255

172.16.50.0 0.0.0.255 eq 21

RI (config) # access-list 110

deny tcp any 172.16.50.0 0.0.0.255 eq 21

RI (config) # access-list 110 permit ip
any

RI (config) # int fa0/1

RI (config-if) # ip access-group 110 out
RI # exit

6) List of WAN Connection with Protocol.

- Leased Line
- Digital Subscriveb Line
- Cable Internet
- Fiber Internet Access
- Multi-protocol Label Switching
- Wireless WAN.

Protocol :-

- Frame Relay
- X.25
- ISDN (Integrated Services digital Network)
- LAPB (Link Access procedure Balanced)
- HDLC (High level Data link control)
- SDLC (Synchronous Data link control)
- PPP (Point to point)

7) Explain Frame Relay and PPP.

→ Frame Relay is a packet switching technology that fragments into transmission units called frames and sent in high-speed bursts through a digital network.

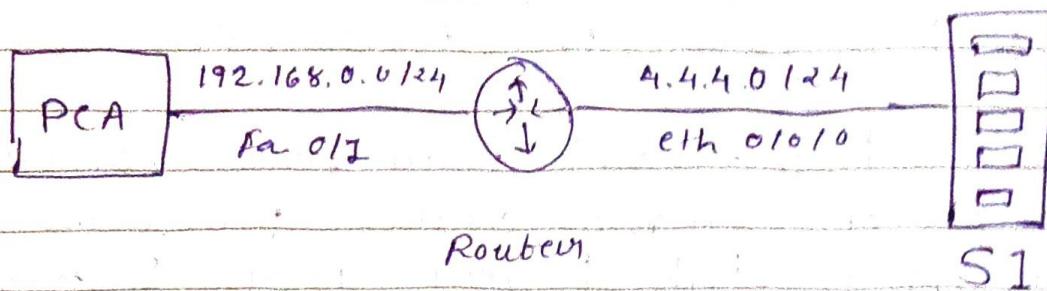
Establishes an exclusive connection during the transmission period called Virtual Connection.

PPP (Point to point)

- Point-to-Point Protocol is communication protocol of the data link layer that is used to transmit multiprotocol data between two directly connected computers.
- It's a byte-oriented protocol that is widely used in broadband communications having heavy loads and high speed.
- It is a data link layer protocol. Data is transmitted in frames. It is also known as RFC 1661.

Q) What is NAT? Explain with one example.

- A Network Address Translation is the process of mapping an internet protocol (IP) address to another by changing the header of IP packets while in transit via a router.
- This helps to improve security and decrease the number of IP addresses and organization needs.



Router # Configure terminal

Router(config)# host name RI

RI(config)# interface fa 0/0

RI(config-if)# ip nat inside

RI(config-if)# exit

RI(config)# interface eth 0/0/0

RI(config-if)# ip nat outside

RI(config-if)# exit

RI(config)# access-list 1 permit 192.168.0.0.
0.0.0.255

RI(config)# ip nat pool MY_POOL 4.4.4.144.4.63
net mask 255.255.255.0.

RI(config)# ip nat inside source list 1
pool MY_POOL

RI(config)# exit

RI# do wr

Q) What is HDLC ? which Command using to Show in software.

- HDLC - High-level Data Link Control is group of communication protocols of the data link layer for transmitting data between network points over nodes.
- it is a data link protocol, data is organized into frames. A frame is transmitted via the network to the destination that verifies its successful arrival.
- It is bit-oriented protocol that is applicable for both point-to-point and multipoint communication.

Command

Configuration.

```
→ Router (config-if) # encapsulation hdlc
Router (config-if) # exit
Router (config) #
```

Show Command :-

```
→ Router # show interfaces Serial 0/0/0
```

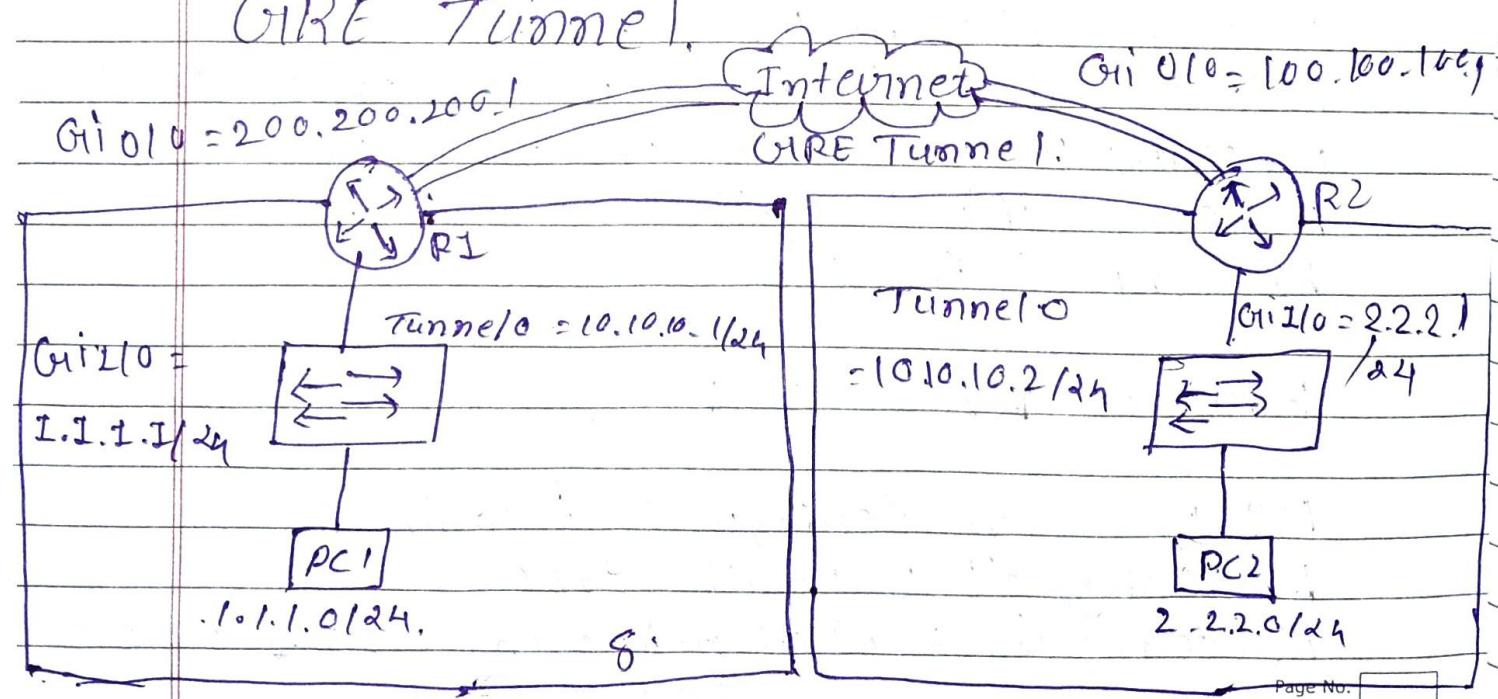
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10) What is Encapsulation? example of GRE Tunnel.

- Encapsulation is a process by which a lower-layer protocol receives data from a higher-layer protocol and then places the data into the data portion of its frame.
- Encapsulation is the process of enclosing one type of packet using another type of packet.
- Encapsulation at the lowest level of the open system interconnection reference mode is sometimes referred to as framing.

Example

GRE Tunnel.



Router - R1

Step - 1

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→ R1 # Configure terminal
 R1 (config)# Interface tunnel 0
 R1 (config-if)# ip address 10.10.10.1
 255.255.255.252
 R1 (config-if)# ip mtu 14100
 R1 (config-if)# ip tcp adjust-mass 1360
 R1 (config-if)# tunnel source 100.100.100.1
 R1 (config-if)# tunnel Destination
 100.100.100.1
 R1 (config-if) # exit
 R1 (config) # exit

Router - R2

Step - 2

R2 # Configure terminal.
 R2 (config)# interface tunnel 0
 R2 (config-if)# ip address 10.10.10.2 255.255.255.252
 R2 (config-if)# ip mtu 14100
 R2 (config-if)# ip tcp adjust-mass 1360
 R2 (config-if)# tunnel source 100.100.100.1
 R2 (config-if)# tunnel Destination 200.200.200.1
 R2 (config-if) # exit
 R2 (config) # exit

Router - R1

Step - 3

R1 # Configure terminal
 R1 (config) # router OSPF 1
 R1 (config-router) # network 1.1.1.1 0.0.0.0
 area 0

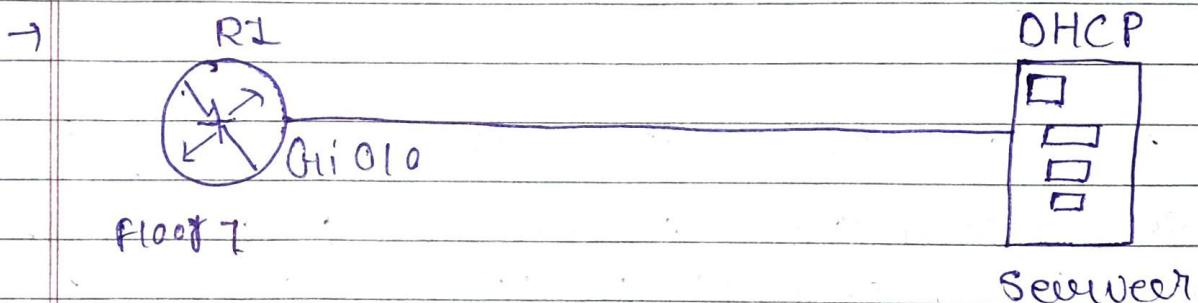
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R1 (config-router) # network 10.10.10.1 0.0.0.0
 area 0
 R1 (config-router) # exit
 R1 (config) # exit

Router - 2Step - 4

R2 # Configure terminal
 R2 (config) # router OSPF 1.
 R2 (config-router) # network 2.2.2.1 0.0.0.0
 area 0
 R2 (config-router) # network 10.10.10.2 0.0.0.0
 area 0
 R2 (config-router) # exit
 R2 (config) # exit

11) Example of DHCP configuration.



- Router1 (config) # ip dhcp excluded-address 192.168.0.1 192.168.0.50
- Router1 (config) # ip dhcp pool f100/8/1 Dhcp

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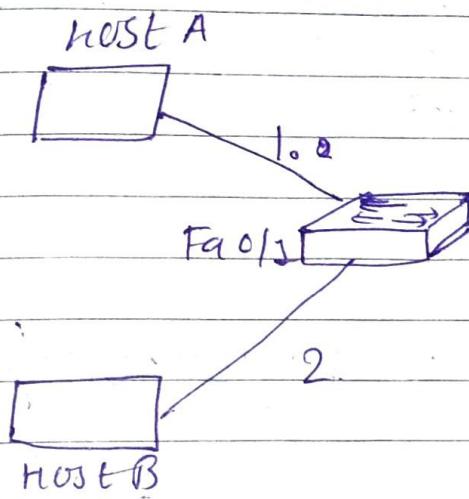
FLOOR1 (dhcp-config) # network 192.168.0.0
 255.255.255.0

FLOOR1 (dhcp-config) # default-router 192.168.0.1

FLOOR1 (dhcp-config) # dns-server 192.168.0.1

FLOOR1 # Show ip dhcp binding

12) Example of Port Security on Switch



Set all IP address in host and then configure.

SW1 (config)# interface fastEthernet 0/1

SW1(config-if)# switchport mode access

SW1(config-if)# switchport-port-security

SW1(config-if)# switchport-port-security mac-address sticky

SW1(config-if)# switchport port security maximum 1