

BASIC INTERVIEW QUESTIONS & ANSWERS ON CCNA

CREATOR – NETWORKKINGS

Qus1:-What is cat stands for in networking?

Ans :- Cat stands for “**CATEGORY**”. Which started from Cat1 (Category1) and now extend up to Cat7 (Category 7). Improved version/category of cable improve the quality of data transmission and make enhancement in bandwidth .provide more stability.

Cat 1 – used for voice only

Cat 2 – used for voice telephone & data communication, maximum **bandwidth is 4 Mbit/s**. Cat 2 cable contains 4 pairs of wires, or 8 wires total.

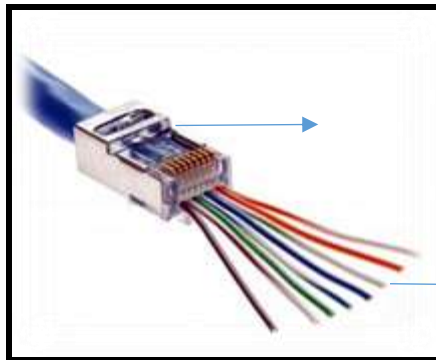
Cat 3 - used for voice & data communication .**Category 3 cable**, commonly known as **Cat 3** or **station wire** .carry data up to **10 Mbit/s**.

Cat 4 - It is used in telephone networks which can transmit voice and data up to **16 Mbit/s**

Cat 5 - The cable provides performance of up to **100 MHz** and Cat 5 is also used to carry other signals such as telephony and **video**.Cat5 does not support exact 100 MHz . but Cat5e provide exact 100 MHz bandwidth.

Cat 6 – It increase the performance of up to **250 MHz** compared to 100 MHz for Cat 5 and Cat 5e.

Cat7-- Ethernet cable is the newest cable category, operating at speeds of **10 Gb/s** at 100 meters of cable and transmitting frequencies up to **600 Mhz**.



RJ45 Connector, RJ stands for Registered Jack

Unshielded 8 wires

Qus2 :- APIPA

Ans :- Automatic Private IP addressing with this , A DHCP client can automatically configured an IP address & subnet mask when no DHCP server is available .

It was random address ranging of Class B from 169.254.0.1 to 169.254.255.254 . default subnet mask of 255.255.0.0

Qus3 :- Private IP Address Range of IPV4

Ans :- 3 group of Private IP addresses ----

Class A → 10.0.0.0 to 10.255.255.254

Class B → 172.16.0.0 to 172.31.255.254

Class C → 192.168.0.0 to 192.168.255.254

Qus4 :- Broadcast Domain and Collision Domain

Ans :- HUB → Single Broadcast Domain and Single Collision Domain

SWITCH → Single Broadcast Domain and Multiple Collision Domain. But can also separate Broadcast Domain by using VLAN's

ROUTER → Multiple Broadcast and Multiple Collision Domain

Qus5:- Difference between a collision domain and a broadcast domain?

Ans:- A collision domain is a network segment with two or more devices sharing the same bandwidth (where there is a chance of collision)

A broadcast domain is a logical division of a computer network, in which all nodes can reach other by broadcast at the data link layer.

Qus6 :- OSI and TCP/IP Model

Ans:-OSI stands for Open System Interconnection developed by International Standard Organization ISO . It is just a reference model.

Consist 7 layers which has bottom to top approach –

- Application Layer
- Presentation Layer
- Session Layer
- Transport Layer
- Network Layer
- Data Link Layer
- Physical Layer

TCP/IP came 10 years before then OSI Model and it actually works in real scenarios.

Consist 4 layers --

- Application Layer
- Transport Layer
- Internet layer
- Network Interface layer/Link Layer /Network Link Layer

TCP/IP	OSI Model	Protocols
Application Layer	Application Layer	DNS, DHCP, FTP, HTTPS, IMAP, LDAP, NTP, POP3, RTP, RTSP, SSH, SIP, SMTP, SNMP, Telnet, TFTP
	Presentation Layer	JPEG, MIDI, MPEG, PICT, TIFF
	Session Layer	NetBIOS, NFS, PAP, SCP, SQL, ZIP
Transport Layer	Transport Layer	TCP, UDP
Internet Layer	Network Layer	ICMP, IGMP, IPsec, IPv4, IPv6, IPX, RIP
Link Layer	Data Link Layer	ARP, ATM, CDP, FDDI, Frame Relay, HDLC, MPLS, PPP, STP, Token Ring
	Physical Layer	Bluetooth, Ethernet, DSL, ISDN, 802.11 Wi-Fi

Qus7:- Port numbers of TCP and UDP Protocols

Ans:- Server provide their services on the basis of port numbers .we have two types of connections –

Transmission control protocol (TCP) & User datagram Protocol (UDP)

TCP – Connection Oriented

- File Transfer Protocol (FTP) – 21
- Hypertext Transfer Protocol (HTTP) -- 80
- Hypertext Transfer Protocol Secure (HTTPS)-- 443
- Secure Shell -22
- Telnet – 23
- Simple Network Management Protocol (SNMP– 161/162
- SMTP - 25
- DNS-53
- Internet Message Access Protocol (IMAP)– 143
- Border Gateway Protocol (BGP) -- 179

UDP – Connection Less

- Domain Name System (DNS) – 53
- Dynamic Host Configuration Protocol (DHCP) – 67/68
- Trivial File Transfer Protocol (TFTP) – 69
- Network Time Protocol (NTP) – 123
- Simple Network Management Protocol (SNMP) – 161/162

Qus8 :- What is Firewall ?

Ans : - firewall is a network security device or network security system which help to provide security to intranet (private Network) . So, that not any unauthorized user can enter into their area .we can also apply security on routers (networking device) as well but only for some extend. Routers provide very less security (Layer 3 device, work on Internet Layer).

Firewall separate the internal (private) & external (public) network. It establishes a barrier between a trusted internal network and untrusted external network.

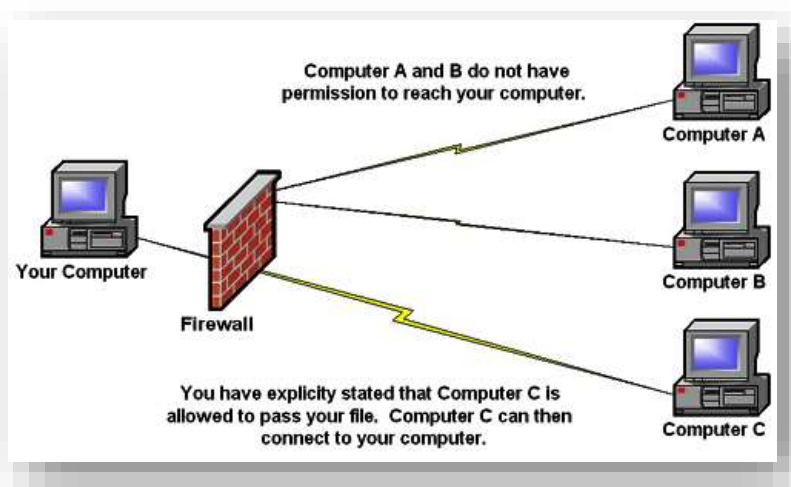
Firewalls can be either hardware or software or combination of both.

Types of firewall --

network firewalls or **host-based firewalls**

list of some company who provide Network Security Services & Appliances




Palo Alto Networks, Clavister ,D-Link, Cyberoam etc



Qus9 :-What is Router ?

Ans:- Router is L3 -Network Layer device . it basically use for routing purpose . every router has it's own brain . they choose the best path from source to destination by checking the information/best suitable path in their routing information table(RIB).

Types of Routing –

- **Static Routing**
- **Default Routing**
- **Dynamic routing**
 - **Interior gateway routing protocol**
 -  **Distance vector routing**
 - RIP,RIPV2
 -  **Link state routing**
 - OSPF ,IS-IS
 -  **Advance Distance vector routing**
 - EIGRP (extended version of IGRP)
 - **Exterior gateway routing protocol**
 - BGP

Qus10:- Difference between OSPF multicast address 224.0.0.5 and 224.0.0.6?

Ans:- 224.0.0.5 - AllSPFRouters: Used to send OSPF messages to all OSPF routers on the same network. The AllSPFRouters address is used for Hello packets. The DR and BDR use this address to send Link State Update and Link State Acknowledgment packets.

224.0.0.6 - AllDRouters: Used to send OSPF messages to all OSPF DRs (the DR and the BDR) on the same network. All OSPF routers except the DR use this address when sending Link State Update and Link State Acknowledgment packets to the DR.

Qus 11: - AD value of Dynamic Routing Protocols -- RIP, EIGRP &OSPF.

Ans :-Administrative Distance (AD) Value of RIP is **120** with maximum of **15 hop** count as linear .Broadcast address of RIPV1 is **255.255.255.255** and it doesn't carry the subnet mask value .Multicast address of RIPV2 is **224.0.0.9** and it does support subnetting .RIP Timers are – update timer – 30 sec , invalid timer/hold down timer – 180 sec and last one flush timer is 240 seconds .

AD value of EIGRP is 90 and multicast address is 224.0.0.10.It maintain the 3 tables – Teighbor table , topology table and Routing table .

Packet types are –

- Hello pkt → 5 sec
- Update pkt →15 sec
- Query

- Reply
- Acknowledgment

It uses Reliable Transport Protocol with 88 protocol number

AD value of OSPF is 110 and **multicast address is 224.0.0.5 & 224.0.0.6**. It maintains the 3 tables – Neighbor table, Database table and Routing table.

Packet types are –

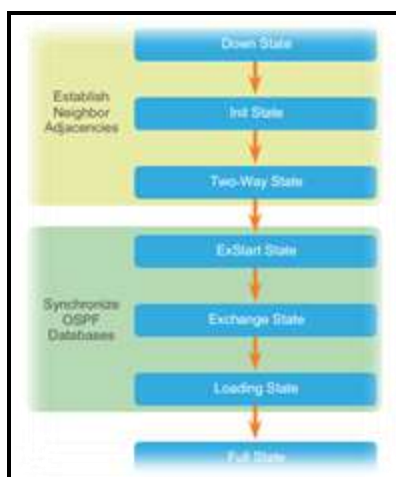
- Hello pkt
- DBD (Data Base Description)
- LSR (Link State Request)
- LSU (Link State Update)
- LSA (Link State Acknowledgment)

Less AD value is always reliable/preferable.

Qus12:- How many States are there in OSPF ?

Ans:- OSPF has to go through 7 states in order to become neighbors. There are 8 states in OSPF.

- DOWN
- INIT
- 2-WAY
- ExSTART
- EXCHANGE
- LOADING
- FULL



Qus13:- Maximum HOP Count in RIP, EIGRP and OSPF

Ans:-RIP , EIGRP and OSPF all three are Dynamic Routing Protocol .

- **RIP** Maximum hop count value is **15** as linear
- **EIGRP** Maximum hop count value is **255**
- **OSPF** can use **unlimited number of hop counts**, but it is recommended to use Maximum up to 100 hop count.

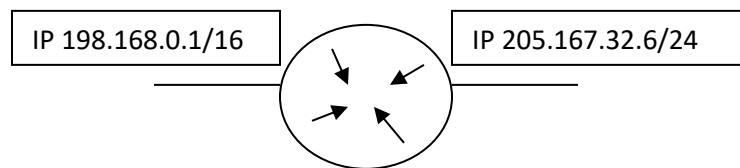
Qus14:- Which protocol support equal and unequal load balancing?

Ans : - EIGRP support Equal and Unequal load balancing , RIP and OSPF only support Equal load balancing .

Qus15:- Router-ID selection in OSPF

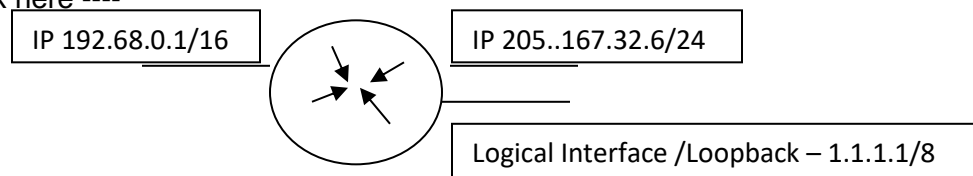
Ans :- the highest IP address of the active physical interface of the router is Router-ID .

If logical interface loopback is configured ,the highest IP address of the logical interface is Router-ID .



Here 205.167.32.6 will be your Router-ID, as this is highest physical IP address.

If we add loopback here ----



Here now 1.1.1.1 will become Router-ID if loopback interface ID is still less than the physical interface, then also it become Router-ID.because virtual interface is good(active default and no shut required) as compared to physical one. Physical interface can down any time but logical not .

If we add one more loopback 20.1.1.1 higher than 1.1.1.1, here 20.1.1.1 will become your Router-ID

Qus16 :- EIGRP work on which algorithm and it's metric calculation

Ans:- EIGRP work on **Defusing Update Algorithm (DUAL)**

Metric Calculation formula --

- $10^7 / (\text{Min Bandwidth})$
- Sum of delays/10
- Metric = (Bandwidth + Delay) * 256

Qus17:- Working of Switch

Switch is an interconnecting device with 16 or 24 ports in common. All other devices are connected to these ports. Whenever any machine sends packet to any other machine, source machine sends packet to switch, switch then forwards it to destination machine. Each packet which comes to switch contains source and destination physical address in it, on basis of which switch forwards packet to other machine. Switch always sends packet based on destination MAC address. Its process is as follows:

(process also known as Switching)

1. When switch receives a packet from any device, it checks for its destination MAC address.

2. Then switch compares destination MAC address with its MAC Address Table for corresponding MAC address.

a. If MAC Address is found, packet is sent out to port against which MAC Address was matched.

b. If entry is not found, Unknown unicasts (when the switch doesn't have a port mapping for a destination mac address in the frame) are treated like broadcasts by Layer Two devices, and are flooded out of all ports except the port on which the frame originated.

Now question comes, how does switch know on which port destination machine is connected? -- For this switch uses one table in its cache memory called MAC Address table or Forwarding Table in which switch stores that at which port which machine is connected by storing its physical address (MAC Address). So table contains two columns (Physical Address and Port Number) and rows equal to number of ports in switch.

When switch is turned ON, by default there is no entry in MAC address table, as communication starts, based on devices involved entries are created in table.

Qus18:- Working of Address Resolution Protocol (ARP)

ARP is a layer 2 protocol, used for obtaining MAC address of any devices within a network. Host machines use ARP protocol to obtain MAC Address. ARP protocol in conjunction with Layer 3 IP Protocol addressing (IP Address).

Host machine uses ARP because when machine needs to send packet to another device, destination MAC address is needed to be written in packet sent, so host machine should know the MAC Address of destination machine. Operating Systems also maintain ARP Table (MAC Address Table).

To obtain MAC address, ARP performs following process: (ARP request by host machine)

1. Source machine generate ARP REQUEST packet with source MAC address (of this machine), source IP address (of this machine) and destination IP address and forwards this packet to switch.
2. Switch receives the incoming packet and reads the source MAC address and checks its MAC address table, if entry for packet at incoming port is found then it checks its MAC address with the source MAC address and updates it, if entry not found then switch add and entry for incoming port with MAC address.
3. All ARP REQUEST packets are broadcasted in network, so switch broadcast ARP REQUEST packet in network, because destination for ARP packet will be 255.255.255.255. (Broadcast are those packets which are sent to everyone in network except the sender, only in network to which it belongs, it cannot span multiple networks)
4. All devices in network receives ARP packet and compare their own IP address with the destination IP address in that packet.
5. Only the machine which matches the both will reply with ARP reply packet. This packet will have source IP of this machine (which was destination machine in previous packet, as now its replying this machine will be the source machine) , source MAC address, destination MAC address (same as source MAC address in REQUEST packet) and destination IP address (same as source IP address in REQUEST packet).
6. Then switch reads the ARP reply message and add entry in its MAC Address Table for port number on which it has received packet by reading its source MAC address field and forwards that packet to destination machine (source machine in REQUEST packet) as its MAC is indestination MAC address.
7. Further host machine add destination machine entry into its ARP table. This using ARP resolution switch and other devices in network obtain MAC address of any other device in a network. Remember ARP works on broadcast, so it works only in single network.

Qus19:- Difference between access link and trunk link ?

Ans :-Access link – access link carry only one VLAN information .It does not tag the frame . Mainly this link is established in between computer/PC/Node and Switch.

Trunk Link – trunk link carry information of multiple VLAN's. It tags the frame. So, that receiving switch would know which VLAN's information it has carried and transfer/pass that information accordingly. Mainly this link is established in between the Switches.

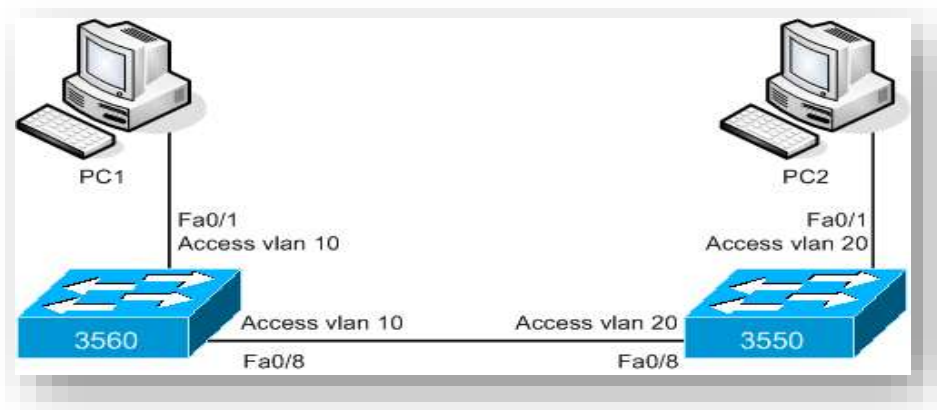
Qus20 :- Native VLAN

Ans :- Native VLAN is the only VLAN which is not tagged in the trunk. Native VLAN frames are transmitted unchanged. By default VLAN 1 is the NATIVE VLAN. If your switch receives a frame with no VLAN information, it assumes this frame belongs to the NATIVE VLAN.

Types of VLANs –

- Default VLAN
- Native VLAN
- DATA VLAN
- VOICE VLAN
- PRIVATE VLAN
- MANAGEMENT VLAN

Qus 21: - If on 2 switches different VLAN's are configured and have access link between the switches. Can the PC's ping each other?



Ans :- They both can ping each other. The issue is that the switch interlink are both access ports. An access port will not send or accept tagged traffic. Hence when SW1 sends PC1's traffic over the link, the tag is removed. When that packet comes into SW2's fa0/8 interface, that interface is part of vlan 20. SW2 will allow that frame to flow to PC2. The same happens vice-versa.

Qus22: - Trunking protocols

Ans :- There are two trunking protocols –

ISL and IEEE DOT1Q/802.1Q

ISL → Inter Switch Link is Cisco proprietary protocol. That is 30 bytes in length. It add 30 bytes info in it's frame that obviously increase the size of frame. Even cisco also recommend to use IEEE 802.1Q for encapsulation.

IEEE DOT1Q/802.1Q → It is open standard .defined by IEEE . All vendor support this .it add 4 byte tag to the original frame .it doesn't tag frames that belong to native VLAN.

Qus23 :- Why VTP is needed ? Their modes and which mode use extended vlan ?

Ans :- Virtual Trunking Protocol use for propagate VLAN Database . Database creates in Vlan.dat file and store in flash memory.

VTP Modes –

Client Mode → can not use extended vlan .

Server Mode → can not use extended vlan , by default VTP is in server mode

Transparent Mode → can use extended vlan ranges from <1006-4096>

Off Mode → VTP Off

Qus24 :- DHCP

Ans :- DHCP stands for Dynamic host configuration protocol , It assign IP addresses to node/computer/PC automatically .It work on Discover offer request acknowledgment DORA process. It is a UDP connectionless and support port number 67/68 .

Qus25:- PC/Computer/Node doesn't not have an IP address how it will contact DHCP server?

Ans :- PC/Computer/node will send request to all the connected devices via broadcast but only the DHCP server will accept this request and assign IP address from pool to the system . It works on "**DISCOVER OFFER REQUEST ACKNOWLEDGMENT (DORA)**" Process.

Qus26:- NAT

Ans :- “ Network Address Translation” It is a process where a network device , usually a firewall , assign a public address to a computer (or group of computers)inside a public network (intranet).

The main use of NAT is to limit the no. of public addresses an organization or company must use for both economy and security purpose.

It allow multiple private IP addresses to represent into by a smaller number of public IP addresses.

Types of NAT

- Static NAT
- Dynamic NAT
- Port Address Translation PAT

Qus27:- In Ether Channel /Port Channel /Link Aggregation, two switches are connected. On one switch lacP is running and on another switch pagP is running. Will they be able to establish communication?

Ans :- “NO” all ports in an ether channel must use the same protocol , you can not use two protocols on two ends . In other words pagP and lacP are not compatible so , both ends of a channel must use the same protocol .

Qus28:- Main difference between Standard and Extended Access-list? How packet filtering is done?

Ans :- Access-List provide **L3 security**. There are of 2 types ACL's

1. **Numbered**
2. **Named**

- Numbered Standard Access list range is from 1-99
- It blocks a network, host and subnet.
- All services are blocked
- Implement closest to the destination
- **Packet filtering is based on only source IP address.**
- Numbered Extended Access list range is from 100-99.

- Can block a network, host, subnet and services.
- Can block any specific service as per requirement
- Implement closest to the source
- **Packet filtering is based on source, destination address and protocol and port number.**

“Named Access-List mainly preferable because it has editing feature”

Qus29:- IPV4 and IPV6 address types

Ans : - IPV4 --

- Broadcast
- Multicast
- Unicast

IPV6 –

- Multicast
- Unicast
- Anycast → Good feature in IPV6

“IPV6 is 128 bit long , having 8 octets/blocks . Each block contain 16 bits . It got implemented to reduce address shortage in IPV4” IP address is given to every device in the network and it is used to identify the device with in the network.

Qus30:- STP States and how Root Bridge, Root port and Designated Port got select?

Ans : - Spanning Tree Protocol is a loop prevention technique defined by IEEE 802.1d .Switches run STP by default , Switches use spanning tree algorithm STA to decide which port should be shut down.

STP States –

- Disable
- Blocking
- Listening
- Learning
- Forwarding

The selection of Root Bridge is based on Bridge_ID , Bridge_ID consist bridge priority and MAC address .by default priority is 32768. If all switches have same priority then root bridge selection will be based on MAC address. Bridge_ID go in BPDU packet. Every switch share Bridge protocol data unit (BPDU) after 2 seconds.

All ports of Root Bridge are designated ports

The ports that are connected directly with Root Bridge become root port.

Convergence time of STP is 32 seconds

