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1. **What is Routing?**

   Routing is the process of finding a path through which data can pass from source of one network to the destination of another network. Routing is done by devices called routers, which are network layer devices.

2. **What is the purpose of the Data Link layer?**

   The job of the Data Link layer is to ensure that messages are sent to the right device. Another function of this layer is framing.

3. **What is the key advantage of using Switches?**

   When a switch receives a signal, it creates a frame out of the bits that were extracted from that signal. With this process, it gains access and reads the destination address, after which it forwards that frame to the appropriate port. This is a very efficient means of data transmission, instead of broadcasting it on all ports.

4. **When does Network Congestion occur?**

   Network congestion occurs when too many users are trying to use the same bandwidth. This is especially true in big networks that do not resort to network segmentation.

5. **What is a Window in networking terms?**

   A Window refers to the number of segments that are allowed to be sent from source to destination before an acknowledgment is sent back.

6. **Does a bridge divide a network into smaller segments?**

   Not really. A bridge actually takes the large network and filters it, without changing the size of the network.

7. **Which LAN switching method is used in CISCO Catalyst 5000?**

   This model uses the Store-and-forward switching method. It stores the entire frame to its buffers and performs a CRC check before deciding whether or not to forward that data frame.

8. **What is the role of the LLC sublayer?**

   The LLC sublayer, short for Logical Link Control, can provide optional services to an application developer. One option is to provide flow control to the Network layer by using stop/start codes. The LLC can also provide error correction.

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9. How does RIP differ from IGRP?

RIP relies on the number of hops in order to determine the best route to a network. On the other hand, IGRP takes many factors into consideration before it decides the best route to take, such as bandwidth, reliability, MTU and hop count.

10. What are the different memories used in a CISCO router?

Different memories used in a CISCO router are –

- NVRAM – it stores the startup configuration file.
- DRAM – it stores the configuration file that is being executed
- Flash Memory – it stores the Cisco IOS

11. What is BootP?

BootP is a protocol which is used to boot diskless workstations connected to the network. It is a short form for Boot Protocol. Diskless workstations use BootP in order to determine its own IP address as well as the IP address of the server PC.

12. What is the function of the Application Layer in networking?

The Application Layer supports the communication components of an application and provides network services to application processes which span beyond the OSI reference model specifications. It also synchronizes the applications on the server and client.

13. Differentiate between User Mode and Privileged Mode.

While using a CISCO router, User Mode is used for a regular task such as to view system information, connecting to remote devices, and checking the status of the router. On the other hand, Privileged mode includes all options which are available for User Mode, plus numerous other options. You can use the Privileged mode in order to make configurations on the router, including tests and debugging.

14. What is 100BaseFX?

This is Ethernet that makes use of fiber optic cable as the main transmission medium. The 100 stands for 100Mbps, which is the data speed.

15. Differentiate full-duplex from half-duplex.

In full-duplex, both the transmitting device and the receiving device can communicate simultaneously, that is, both can transmit and receive at the same time. In the case of half-duplex, a device cannot receive while transmitting, and vice versa.

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16.What is MTU?

MTU stands for Maximum Transmission Unit. It refers to the maximum packet size that can be sent out onto the data line without the need to fragment it.

17.How does cut-through LAN switching work?

In Cut-Through LAN switching, as soon as the router receives the data frame, it immediately sends it out again and forwards it to the next network segment after reading the destination address without checking FCS.

18.What is latency?

Latency is the amount of time delay that measures the point from which a network device receives a data frame to the time it sends it out again towards another network segment.

19.Utilizing RIP, what is the limit when it comes to a number of hops?

The maximum limit is 15 hop counts. Anything higher than 15 indicates that the network is considered unreachable.

20.What is a Frame Relay?

Frame Relay is a WAN protocol that provides connection-oriented communication by creating and maintaining virtual circuits. It has a high-performance rating and operates at the Data Link and Physical Layers.

21.How do you configure a Cisco router to route IPX?

The initial thing you need to do is to enable IPX routing by using the “ipx routing” command. Each interface that is used in the IPX network is then configured with a network number and encapsulation method.

22.What are the different IPX access lists?

There are two access lists: Standard and Extended. Standard Access List can only filter the source or destination IP address. An Extended Access List uses the source as well as destination IP addresses, port, socket and protocol when filtering a network.

23.Explain the benefits of VLANs.

VLANs allow the creation of collision domains by groups other than just physical location. With the use of VLANs, it is possible to establish networks by different means, such as by function, type of hardware, protocol, among others. This is a big advantage when compared to conventional LANs wherein collision domains are always tied to physical location.

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24.What is subnetting?

Subnetting is the process of creating smaller networks from a big parent network. Being a part of a network, each subnet is assigned some additional parameters or identifier to indicate its subnet number.

25.What are the advantages of a layered model in the networking industry?

A layered network offers many advantages. It allows administrators to make changes in one layer without the need to make changes in the other layers. Specialization is encouraged, allowing the network industry to make progress faster. A layered model also let the administrators troubleshoot problems more efficiently.

26.Why is UDP lease favored when compared to TCP?

It's because UDP is unreliable and unsequenced. It is not capable of establishing virtual circuits and acknowledgments.

27.What are some standards supported by the Presentation layer?

Presentation layer supports many standards which ensure that data is presented correctly. These include PICT, TIFF and JPEG for graphics, MIDI, MPEG and QuickTime for Video/Audio.

28.What's the simplest way to remotely configure a router?

In case, when you need to configure a router remotely, the most convenient way is to use the Cisco AutoInstall Procedure. However, the router must be connected to the WAN or LAN through one of the interfaces.

29.What does the show protocol display?

- Routed protocols that are configured on the router.
- The address assigned to each interface.
- The encapsulation method that was configured on each interface.

30.How do you depict an IP address?

It can be done in three possible ways:

- Using Dotted-decimal, for example – 192.168.0.1
- Using Binary, for example – 10000010.00111011.01110010.01110011

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31. How do you go to privileged mode? How do you switch back to user mode?

To access privileged mode, enter the command “enable” on the prompt. In order to get back to user mode, enter the command “disable”.

32. What is HDLC?

HDLC is a short form of High-Level Data Link Control protocol and is a propriety protocol of CISCO. It is the default encapsulation operated within CISCO routers.

33. How are internetworks created?

Internetworks are created when networks are connected using routers. Specifically, the network administrator assigns a logical address to every network that connects to the router.

34. What is Bandwidth?

Bandwidth refers to the transmission capacity of a medium. It is a measure of how much volume a transmission channel can handle and is measured in Kbps.

35. How does Hold-downs work?

Hold-downs prevent regular update messages from reinstating a downed link by removing that link from update messages. It uses triggered updates to reset the hold-down timer.

36. What are packets?

Packets are the results of data encapsulation. These are data that have been wrapped under the different protocols of the OSI layers. Packets are also referred to as datagrams.

37. What are segments?

Segments are sections of a data stream that comes from the upper OSI layers and ready for transmission towards the network. Segments are the logic units at the Transport Layer.

38. What are the benefits of LAN Switching?

Some benefits of LAN switching are –

- Allows full duplex data transmission and reception
- Media rate adaption
- Easy and efficient migration

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39. What is Route Poisoning?

Route Poisoning is the process of inserting a table entry of 16 to a route making it unreachable. This technique is used in order to prevent problems caused by inconsistent updates on a route.

40. How do you find valid hosts in a subnet?

The best way is to use the equation 256 minus the subnet mask. The hosts that are considered valid are those that can be found between the subnets.

41. What is DLCI?

DLCI, or Data Link Connection Identifiers, are normally assigned by a frame relay service provider in order to uniquely identify each virtual circuit that exists on the network.

42. What are the different types of passwords used in securing a CISCO router?

There are actually five types of passwords that can be used. These passwords are enable secret, enable, virtual terminal, console, and auxiliary.

43. Why is network segmentation a good idea when managing a large network?

For a network administration, segmenting a network would help ease network traffic and ensure that every time a high bandwidth is made available for all the users. This results in a better performance, especially for a growing network.

44. What are the things that can be accessed in a CISCO router's identifying information?

The things that can be accessed in a CISCO router's identifying information are the hostname and the Interfaces. The hostname is the name of your router and the Interfaces are fixed configurations that refer to the router ports.

45. Differentiate Logical Topology from Physical Topology

Logical Topology refers to the signal path through the physical topology. Physical Topology is the actual layout of the network medium.

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46. In configuring a router, what command must be used if you want to delete the configuration data that is stored in the NVRAM?

A. Erase running-config
B. Erase startup-config
C. Erase NVRAM
D. Delete NVRAM

Correct Answer: B. Erase startup-config

47. Referring to the commands shown, what command must be used next on the branch router prior to traffic being sent to the router?

Hostname: Branch Hostname: Remote
PH# 123-6000, 123-6001 PH# 123-8000, 123-8001
SPID1: 32055512360001 SPID1: 32055512380001
SPID2: 32055512360002 SPID2: 32055512380002
isdn switch-type basic ni
username Remote password cisco
interface bri0
ip address 10.1.1.1 255.255.255.0
encapsulation ppp
ppp authentication chap
isdn spid1 41055512360001
isdn spid2 41055512360002
dialer map ip 10.1.1.2 name Remote 1238001
dialer-list 1 protocol ip permit

Correct Answer: (config-if)# dialer-group 1

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48. When configuring a router making use of both physical and logical interfaces, what factor must be considered for determining the OSPF router ID?

A. The highest IP address of any physical interface.
B. The lowest IP address of any logical interface.
C. The middle IP address of any logical interface.
D. The lowest IP address of any physical interface.
E. The highest IP address of any interface.
F. The highest IP address of any logical interface.
G. The lowest IP address of any interface.

Correct Answer: F. The highest IP address of any logical interface.

49. What is the difference between the switch, hub, and router?

Hub	Switch	Router
Hub has single broadcast domain and collision domain. Anything comes in one port is sent out to the others.	It is a device that filters and forwards packets between LAN segments. Switches have single broadcast domain and multiple collision domains. It supports any packet protocol, as such it operates at the data link layer 2 and layer 3.	Router is a device which transmits data packets along the networks.

50. What does data packets consist of?

A data packet consists of sender's information, recipient's information, and the data contained. It also has the numeric identification number which defines the packet number and order. When data is send across the network, that information is segmented into data packets. In short, data packets carry the information and routing configuration for your transferred message.

51. What is DHCP?

DHCP stands for Dynamic Host Configuration Protocol. DHCP automatically assigns an IP address to a given workstation client. You can also make static IPS for machines like printers, servers, routers and scanners.

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52.What is the difference between dynamic IP and static IP addressing?

Dynamic IP addresses are provided by DHCP server and static IP addresses are given manually.

53.What are the ranges for the private IP's?

Ranges for private IPS are –

- Class A: 10.0.0.0 – 10.0.0.255
- Class B: 172.16.0.0 – 172.31.0.0
- Class C: 192.168.0.0 – 192.168.0.255

54.In how many ways you can access the routers?

You can access routers in three ways –

- Telnet (IP)
- AUX (Telephone)
- Console (Cable)

55.Explain what is EIGRP?

EIGRP stands for Enhanced Interior Gateway Routing Protocol; it is a routing protocol designed by Cisco Systems. It is availed on a router to share routes with other routers within the same autonomous system. Unlike other routers like RIP, EIGRP only sends incremental updates, decreasing the workload on the router and the amount of data which needs to be transferred.

56.Mention the metric of EIGRP protocol?

EIGRP protocol consists of –

- Bandwidth
- Load
- Delay
- Reliability
- MTU

57.Mention what does the clock rate do?

Clock rate defines how many bits can be transmitted out of a router interface in one second.

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58. What command should be used if you want to delete or remove the configuration data that is stored in the NVRAM?

"Erase startup- config" is the command that should be used for deleting the configuration data which is stored in the NVRAM

59. Mention the difference between TCP and UDP?

TCP and UDP both are protocols for sending files across computer network but there is a vast difference amid the two.

TCP (Transmission Control Protocol)	UDP (User Datagram Protocol)
TCP is connection oriented protocol. When connection is lost during transferring files, the server would request the lost part but there is no corruption while transferring a message.	UDP is based on connectionless protocol. When you send data, there is no guarantee whether your transferred message will reach there without any leakage or not.
The message will be delivered in the order it is sent.	The message you sent may not be delivered in the order it is sent.
Data in TCP is read as a stream, where one packet ends and another begins.	Packets are transmitted individually and are guaranteed to be whole if they arrive.
Example of TCP includes World Wide Web, file transfer protocol, e-mail etc.	Example for UDP are VOIP (Voice Over Internet Protocol), TFTP (Trivial File Transfer Protocol) etc.

60. Explain the difference between half-duplex and full-duplex?

Full duplex means that the communication can occur in both directions at the same time, while half-duplex means that the communication can occur in one direction at a time.

61. Mention the conversion steps of data encapsulation?

Conversion steps of data encapsulation includes –

- Layer five, six and seven (Application/presentation/session): Alphanumeric input from the user is converted into Data.
- Layer Four (Transport): Data is converted into small segments.
- Layer Three (Network): Data converted into packets or datagrams and Network header is added.
- Layer Two (Data Link): Datagrams or packets are built into frames.
- Layer One (Physical): Frames are converted into bits.

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62. What route entry will be assigned to dead or invalid route in case of RIP?

In the case of RIP table entry, 16 hops will be assigned to dead or invalid route making it unreachable.

ANOTHER SET OF QUESTIONS:

1. **What is the 2nd layer of OSI model?**

   Data link layer is the second layer of OSI model.

2. **Which routing protocol sends its complete routing table after every 30 seconds?**

   RIPv1

3. **What is half duplex?**

   In half duplex, communication occurs only in one direction.

4. **At which layer HUB works?**

   HUB work at layer 1 of OSI model

5. **What is the key difference between Hub and a switch?**

   Switch works at layer 2 of OSI while hub works at layer 1. The switch is commonly used to make separate domain while Hub has no concept of separate domains.

6. **What are 2 ways to check interface issues?**

   First, we will ping the IP of 0/1 serial interface. If it is not reachable then we will use #show IP int brief command to check what the issue is. If the issue is not in hands then you can use #show interface serial 0/1 to see what exactly the issue is.

7. **How can you explain a network subnet?**

   A network subnet is a small network derived from a big network.

8. **At which layer of OSI does frame relay technology works?**

   Frame relay technology works at Data link layer OSI model.

9. **Which protocol allows preventing loop free network in switching network?**

   The protocol which allows preventing loop free network in switching network is Spanning Tree Protocol.

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10. How can you telnet a switch which is a layer 2 device and you cannot assign IP on it.

To telnet a switch, there are many ways but the most common way is to assign IP address to a Vlan 1 and make its IP reachable to all attached devices.

11. What does OSPF stands for?

OSPF stands for Open shortest path first.

12. What is the use of Vlan?

Virtual LANs are used to make separate domain in a single switch.

13. What is the range of Class A?

1.0.0.0 to 126.255.255.255

14. How many hosts are there in Class A?

There are total 127 million hosts in Class A in 127 networks.

15. What is PoE?

PoE stands for Power over Ethernet. It is used to connect IP phones as well as provide power to them.

16. To which class the given IP belongs to – "224.0.0.10"?

This is a multicast address. It is a Class D address.

17. Can you use two different subnet IP's on a WAN link?

Yes.

18. Which Vlan is used for native data purpose of switch 3560?

By default, Vlan 1 is used for native Vlan in 3560 switch.

19. Which port telnet is used to connect with a remote device?

Port 23

20. How many ports are reserved for special purposes which host services like HTTP, FTP, and POP3 etc.

Ports from 1 to 1024 are reserved for special services and will only be used by system.

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21. The traditional STP takes 30secs to make the port in forwarding state, what will you do to make it up immediately?

We will run the command -
int fa 0/1
Spanning tree portfast
Exit

22. What does ARP do in a network?

The purpose of ARP is to track MAC address from IP address.

23. What is the range of the Class C?

192.0.0.0 to 223.255.255.255

24. How many hosts can be there in Class C?

Class C can support 254 hosts per network and total networks which can be used are approximately 2 million.

25. What does PING stands for?

Ping stands for Packet Internet Groper.

26. What is the size of a Cisco ping packet?

The default size of a Cisco ping packet is 100 bytes.

27. How can you transfer different Vlans Data?

You can make trunk between two switches and send data concurrently for both VLANs.

28. What is the default configuration revision number of Cisco switch 2950?

The default revision number is 0.

29. How can you say your router is accessible?

You simply need to PING that router. If the reply comes from the router then it is accessible.

30. How RIP work in a switch?

You cannot use RIP in a switch on layer 2

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31.What does MTU stands for?

MTU stand for maximum transmission unit. If you have configured a router then the default MTU is set. The default MTU size is 1500 bytes.

32.What is an IP packet?

It contains source information, destination information, protocol number. It also contains numeric identification number.

33.How many VTP modes are in a switch and what are they?

There are three type of VTP modes and they are Server, client and transparent.

34.In which type EIGRP routed protocol falls?

EIGRP is not routed protocol it is a routing protocol and falls in hybrid type.

35.Which port does RIP use of TCP?

RIP use port of UDP (not TCP) 520.

36.In which version of RIP there is an optional field which can be used for authentication purpose?

RIPv2

37.Which feature should a routing protocol have in order to support VLSM?

It should include subnet mask of each network which is forwarded in the update.

38.What does AAA stands for?

AAA stands for Authentication, Authorization and Accounting

39.What does HSRP protocol do?

It provides a high availability of default gateway. With HSRP, if one gateway goes down, another will come up.

40.What maximum value of administrative can be used?

255

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41. Give me a definition of network in few words.

Network is a connectivity of two or more devices so that they can communicate with each other.

42.Is HSRP a Cisco proprietary or introduced by IEEE?

HSRP is a Cisco's proprietary.

43.If you are using a redundant link between switches. If one link goes down, how much time it will take for the second link to get up.

It will take about 30 seconds for normal STP.

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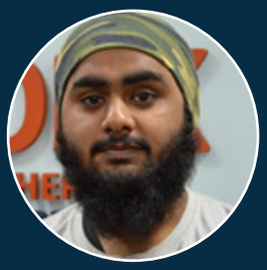

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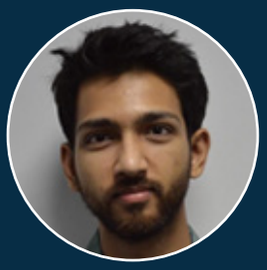

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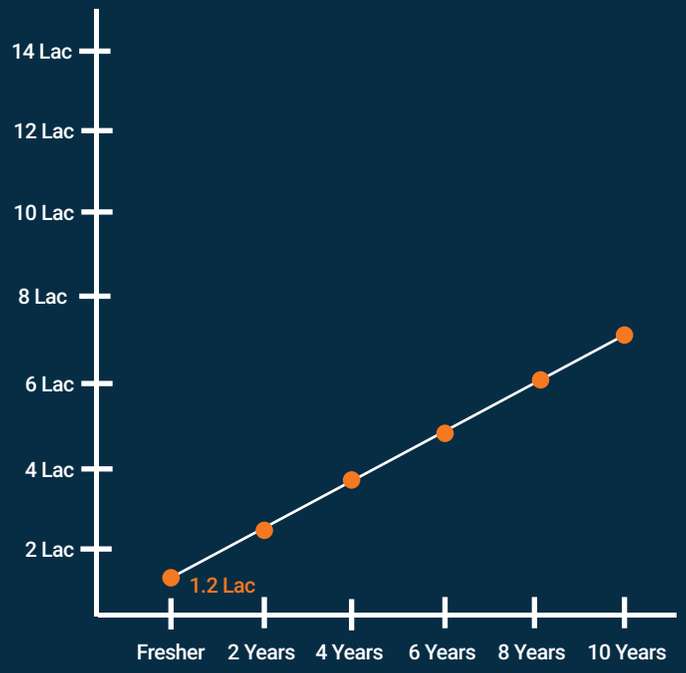

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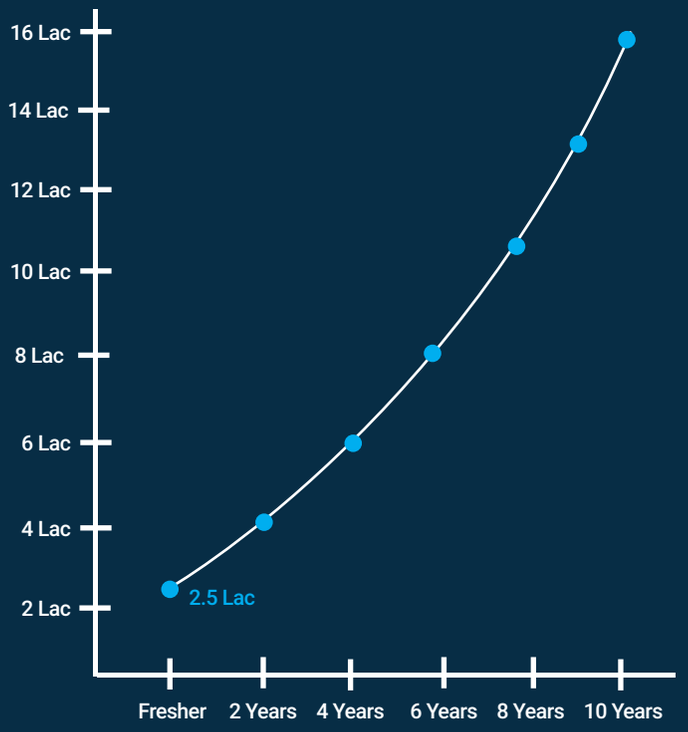

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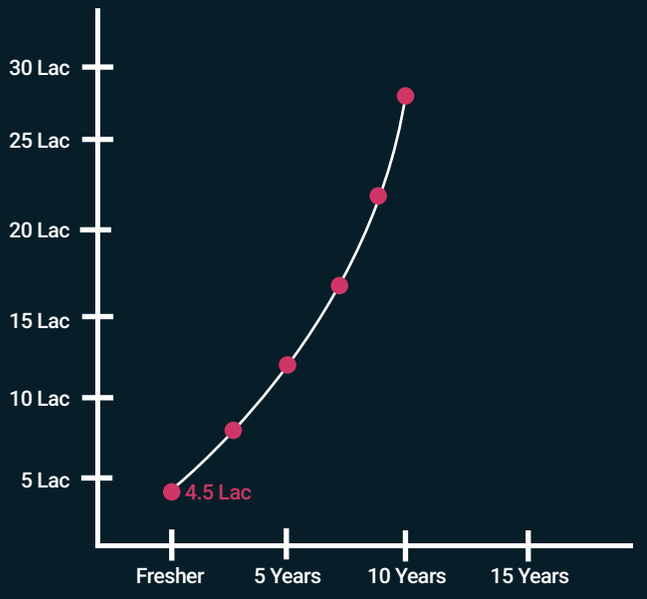

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