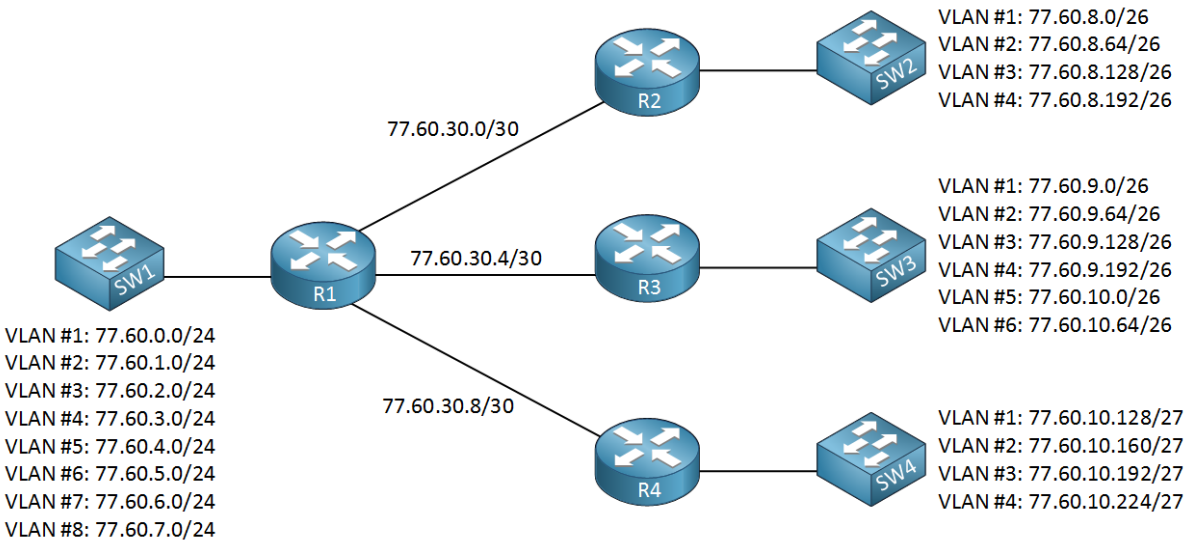
CCNA ASSIGNMENT 2

Q.1 Describe IPv4 address range and explain example of subnetting.

ANS. IP addresses are expressed as a set of four numbers — an example address might be 192.158.1.38. Each number in the set can range from 0 to 255. So, the full IP addressing range goes from 0.0.0.0 to 255.255.255.255.

A subnet is a sub-network of a network that falls within the class A, B or C range. For example, 172.16. 0.0/16 is a class B network. This network is pretty big, it starts with 172.16.



Q.2 List of private address.

ANS. Class A: 10.0. 0.0 to 10.255. 255.255.

Class B: 172.16. 0.0 to 172.31. 255.255.

Class C: 192.168. 0.0 to 192.168. 255.255.

Q.3 What is routing? Explain work of Router and protocol.

ANS. A Router is a process of selecting path along which the data can be transferred from source to the destination. Routing is performed by a special device known as a router.

ROUTER: A router is a device that connects two or more packet-switched networks or subnetworks. It serves two primary functions: managing traffic between these networks by forwarding data packets to their intended IP addresses, and allowing multiple devices to use the same Internet connection.

PROTCOL: In networking, a protocol is a set of rules for formatting and processing data. Network protocols are like a common language for computers. The computers within a network may use vastly different software and hardware; however, the use of protocols enables them to communicate with each other regardless.

Q.4 Which software we are use for routing and switching.

ANS. Cisco Packet Tracer

Q.5 Explain Basic command

ANS. 1.IPCONFIG

2.NSLOOKUP

3.HOSTNAME

4.PING

5.TRACERT

6.NETSTAT

7.ARP

8.SYSTEMINFO

Q.6 Types of Routing– example of Static routing

ANS. 1.Static Routing

2.Default Routing

3.Dynaimc Routing

Explain Static Routing

->Static Routing is also known as Nonadaptive Routing.

->It is a technique in which the administrator manually adds the routes in a routing table.

->A Router can send the packets for the destination along the route defined by the administrator.

->In this technique, routing decisions are not made based on the condition or topology of the networks

Advantages

No Overhead: It has ho overhead on the CPU usage of the router. Therefore, the cheaper router can be used to obtain static routing.

Bandwidth: It has not bandwidth usage between the routers.

Security: It provides security as the system administrator is allowed only to have control over the routing to a particular network.

Q.7 Explain Dynamic routing

ANS. 1.It is also known as Adaptive Routing.

2.It is a technique in which a router adds a new route in the routing table for each packet in response to the changes in the condition or topology of the network.

3.Dynamic protocols are used to discover the new routes to reach the destination.

4.In Dynamic Routing, RIP and OSPF are the protocols used to discover the new routes.

5.If any route goes down, then the automatic adjustment will be made to reach the destination.

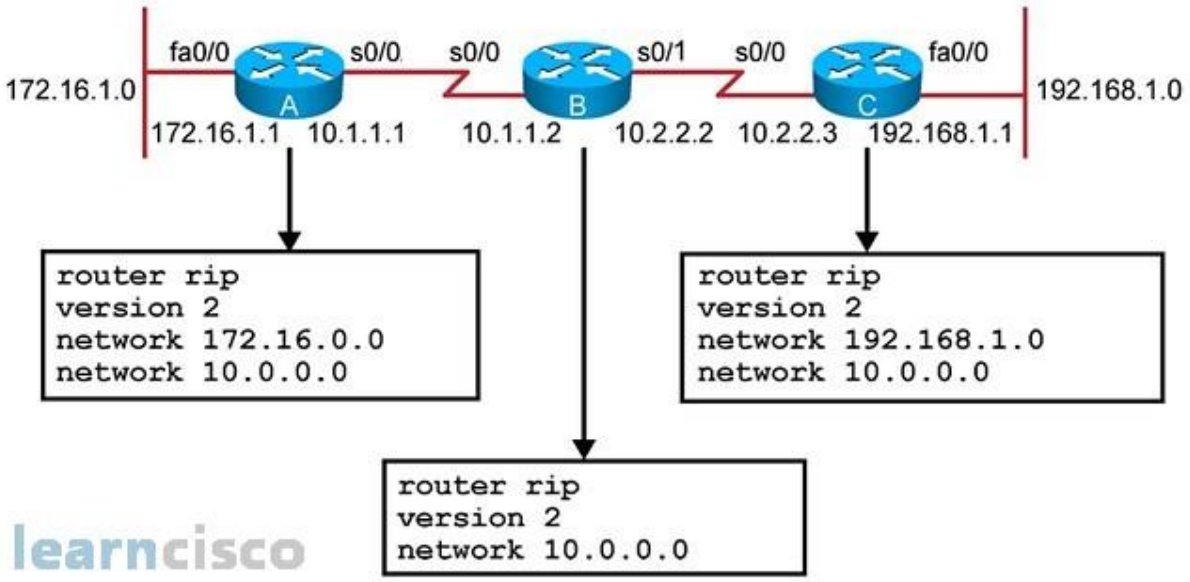
Q.8 Deference btw RIP EIGRP and OSPF.

ANS.

RIP	OSPF	IGRP	EIGRP
RIP stands for Routing Information Protocol	OSPF stands for Open Shortest Path First	IGRP stands for Interior Gateway Routing Protocol	EIGRP stands for Enhanced Interior Gateway Routing Protocol
RIP is a distance vector protocol	OSPF is a link state protocol	IGRP is a distance vector protocol	EIGRP Is derived from Integrated Gateway Routing Protocol
The metrics used Is hop.	The metrics used are bandwidth and delay.	The metrics used are bandwidth, load, delay, MTU, and reliability.	The metrics used are bandwidth, delay, load and reliability
RIP uses Distance vector algorithm to calculate the best path	OSPF uses the SPF algorithm to calculate the best path.	IGRP uses the distance vector algorithm to calculate the best path and the variance mechanism to support unequal-cost load balancing.	EIGRP uses Diffusing update algorithm to calculate the best path.

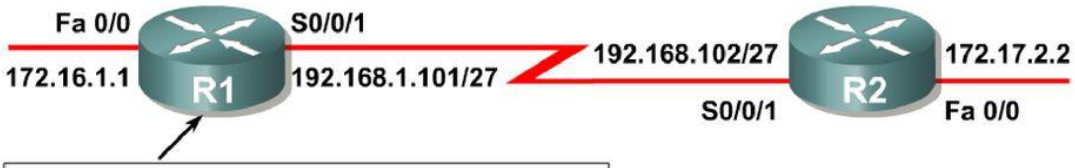
Q.9 Perform Example of RIP EIGRP and OSPF with different area concept.

Ans. RIP



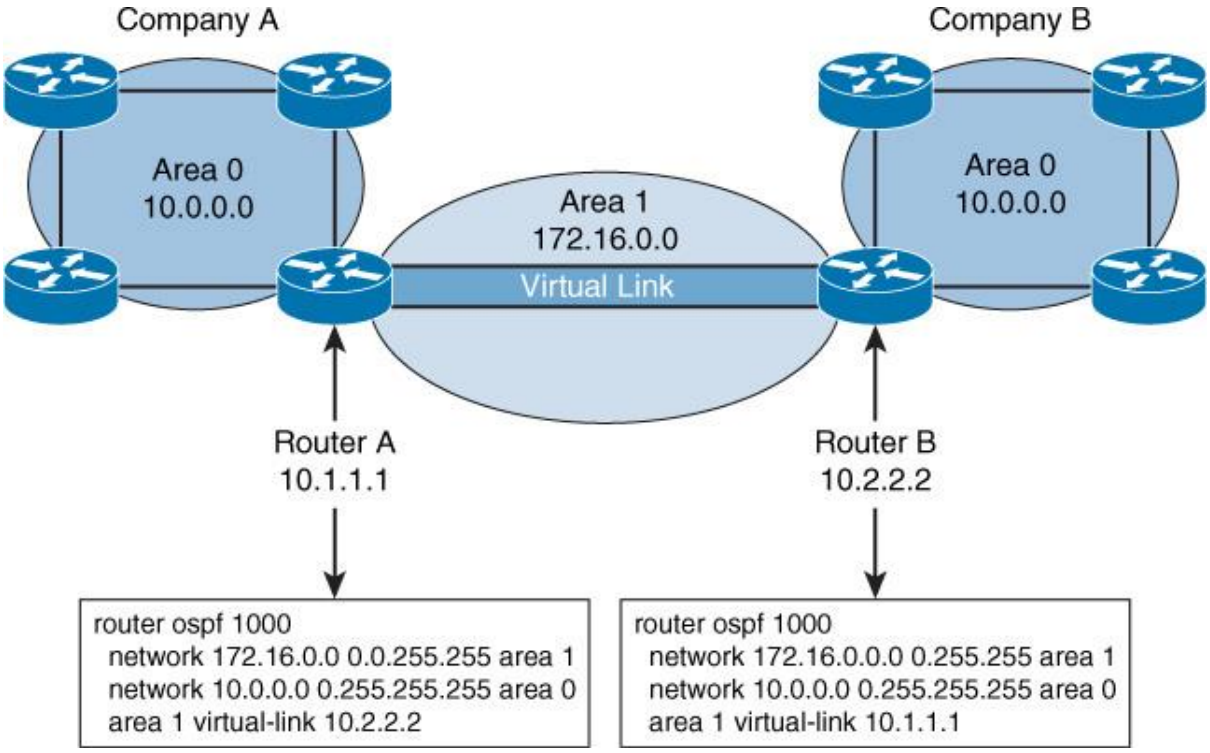
EIGRP

Example R1 EIGRP Configuration



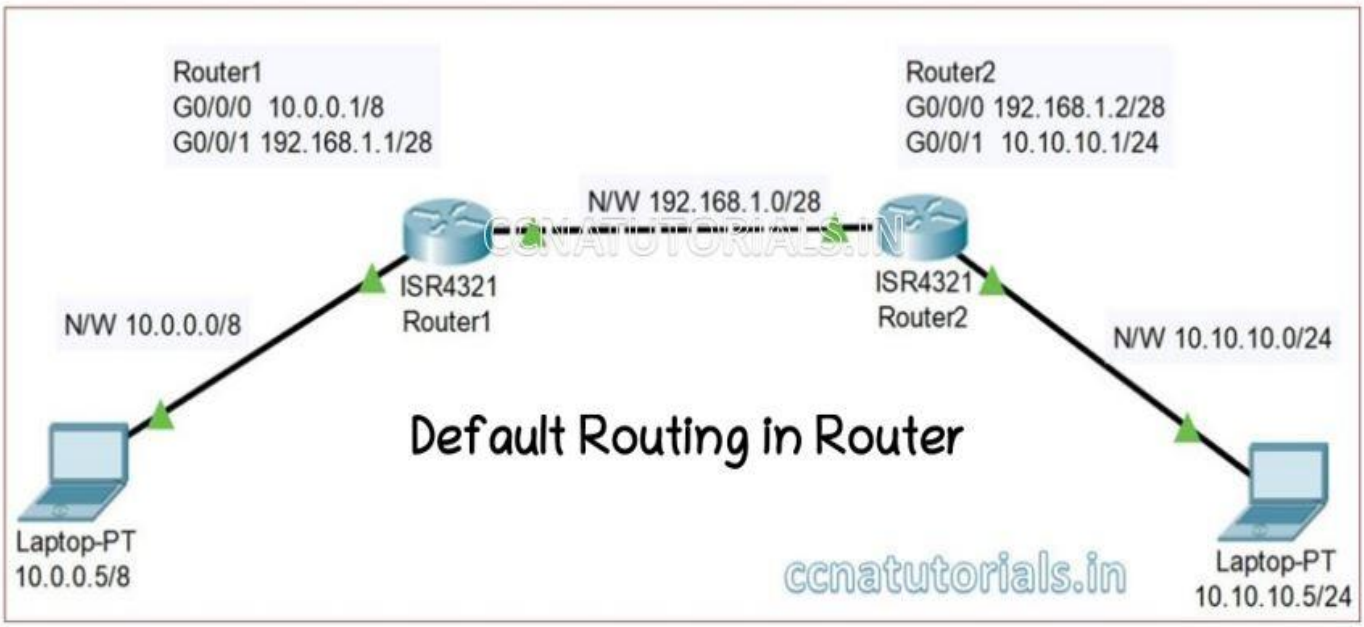

```
<output omitted>
interface FastEthernet0/0
  ip address 172.16.1.1 255.255.255.0

<output omitted>
interface Serial0/0/1
 bandwidth 64
 ip address 192.168.1.101 255.255.255.224

<output omitted>
router eigrp 100
 network 172.16.1.0 0.0.0.255
 network 192.168.1.0
```

OSPF



Q.10 Example of Default routing.

ANS. The default route in Internet Protocol Version 4 (IPv4) is designated as the zero address, 0.0. 0.0/0 in CIDR notation. Similarly, in IPv6, the default route is specified by ::/0. The subnet mask is specified as /0, which effectively specifies all networks and is the shortest match possible.



Q.11 Explain Autonomous system number.

ANS. An autonomous system number (ASN) is a number assigned to a local network, registered into the carrier's routing community and placed under the umbrella of an administrative domain called an autonomous system.

Q.12 What is switching explain VLAN?

ANS. A network switch is networking hardware that connects devices on a computer network by using packet switching to receive and forward data to the destination device. A network switch is a multiport network bridge that uses MAC addresses to forward data at the data link layer of the OSI model.

VLAN

A virtual LAN (VLAN) is a logical overlay network that groups together a subset of devices that share a physical LAN, isolating the traffic for each group.

A LAN is a group of computers or other devices in the same place -- e.g., the same building or campus -- that share the same physical network. A LAN is usually associated with an Ethernet (Layer 2) broadcast domain, which is the set of network devices an Ethernet broadcast packet can reach.

Q.13 What is Access port and trunk port?

ANS. Access Port

These switch ports belong to carry the traffic of only one VLAN. By default, it will carry the traffic of native VLAN (VLAN 1) . If the switch ports are assigned as access ports then they can be considered as the switch ports belongs to a single broadcast domain. Any traffic arriving on these switch ports is considered as it belongs to the VLAN assigned to the port.

Trunk Port

These switch ports belong to and carry the traffic of more than one VLAN. This is a great advantage as to carry the traffic of a group of VLAN, a single switch port can be used. These are of great use if the user wants to exchange traffic between more than one switch having more than one VLAN configured. To identify traffic belongs to VLAN, the VLAN identification method (802.1q or ISL) is used. Also, to carry traffic between more than one VLAN, then inter VLAN routing is required, in which the link between router and switch is configured as

trunk as the link has to carry the traffic of more than one VLAN (in case of a router on a stick configuration not in inter VLAN routing by layer 3 switches).

Q.14 List of basic SHOW command.

ANS. 1. Show running-config

2. show startup-configuration
3. show version
4. show ip route
5. show ipv6 route
6. show interfaces
7. show interfaces gigabitEthernet 0/0
8. show ip interface brief
9. show cdp neighbors
10. show clock
11. show ntp status
12. show flash
13. show history
14. show logging
15. show protcols
16. show users
17. show access-list

18. show ip dhcp binding
19. show ip dhcp pool
20. show ip eigrp neighbors
21. show ip ospf neighbors
22. show ip nat translations
23. show standby

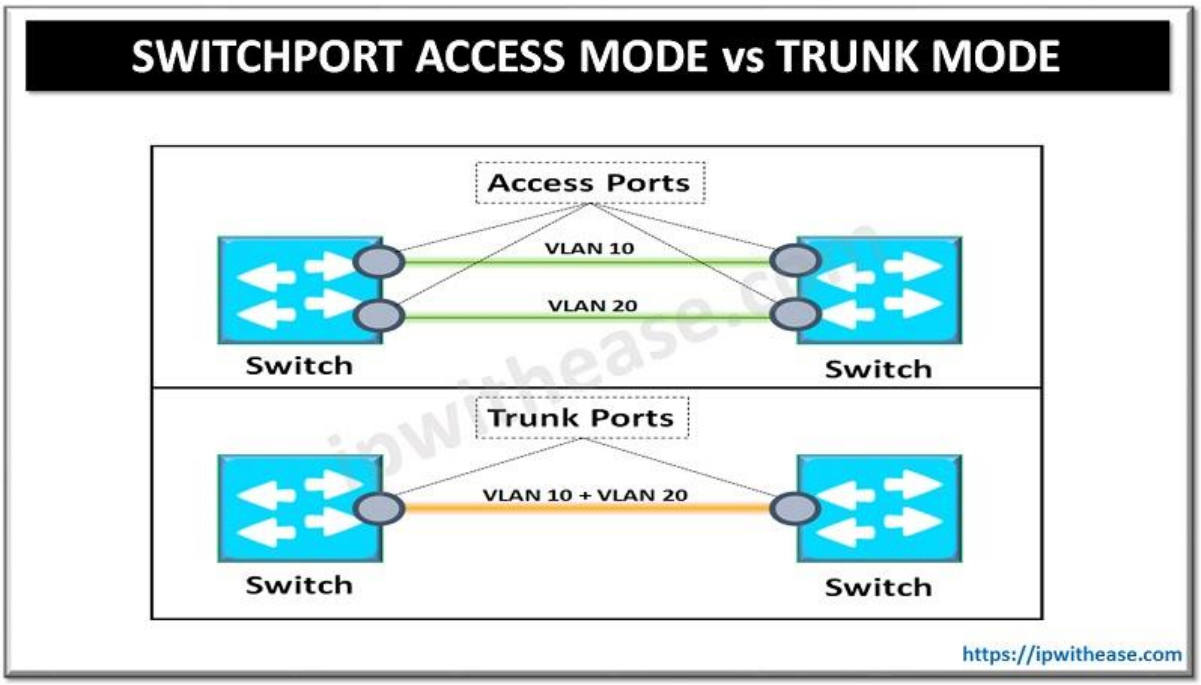
Q.15 Explain of Layer 2 and Layer 3 switch.

ANS. A layer 2 switch is a type of network switch or device that works on the data link layer (OSI Layer 2) and utilizes MAC Address to determine the path through where the frames are to be forwarded. It uses hardware based switching techniques to connect and transmit data in a local area network (LAN).

A Layer 3 switch is basically a switch that can perform routing functions in addition to switching. A client computer requires a default gateway for layer 3 connectivity to remote subnets.

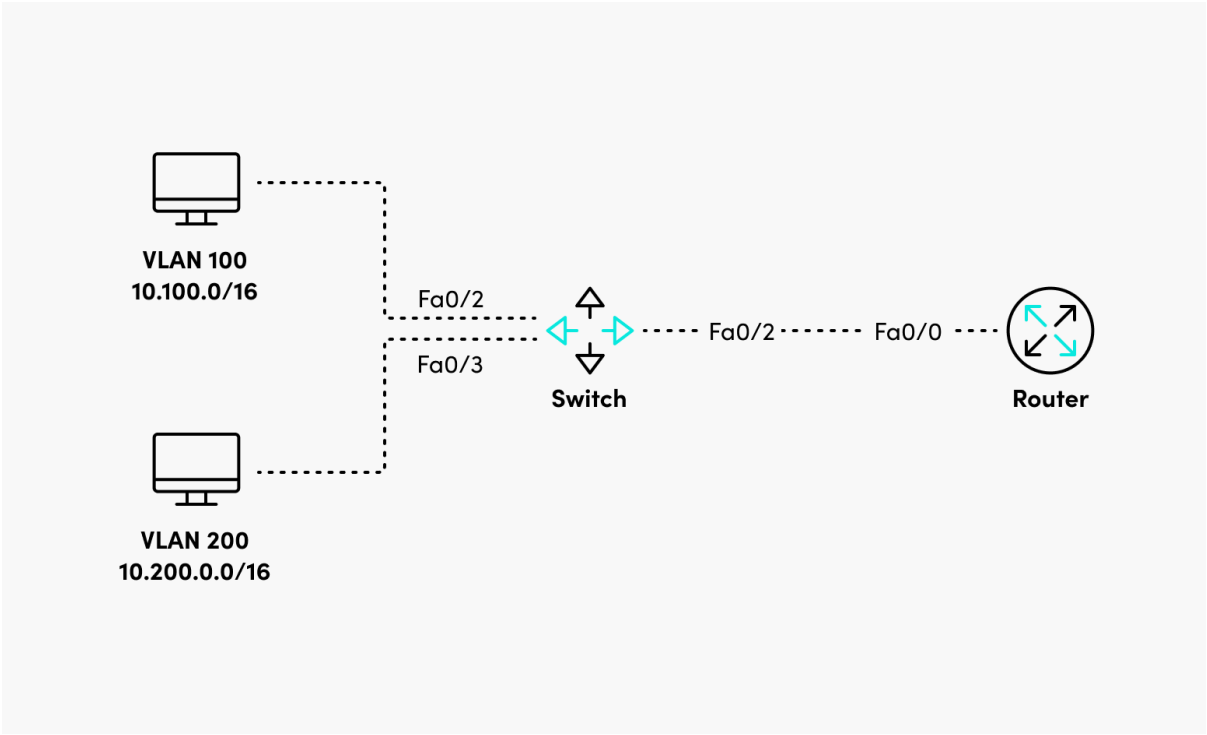
Q.16 Example – VLAN Access port and trunk port.

ANS.



Q.17 Example of inter VLAN routing.

ANS. We'll use the router on a stick model for our first example. In this model, switches with multiple VLANs uplink to a single router. Although there is one physical uplink, the router uses virtual sub-interfaces. One sub-interface per VLAN is used and the router is configured to route traffic between the VLANs.



Router(config)#interface fastEthernet 0/0

Router(config-if)#no shutdown

Router(config-if)#exit

Router(config)#interface fastEthernet 0/0.100

Router(config-subif)#encapsulation dot1Q 100

Router(config-subif)#ip address 10.100.0.1 255.255.0.0

Router(config-subif)exit

Router(config)#interface fastEthernet 0/0.200

Router(config-subif)#encapsulation dot1Q 200

Router(config-subif)ip address 10.200.0.1 255.255.0.0

Router(config-subif)#exit

Q.18 Explain switching method and VTP

ANS. Switching is the technique by which nodes control or switch data to transmit it between specific points on a network. There are 3 common switching techniques: Circuit Switching. Packet Switching. Message Switching.

VTP

VLAN Trunking Protocol (VTP) is a Cisco proprietary protocol that propagates the definition of Virtual Local Area Networks (VLAN) on the whole local area network. To do this, VTP carries VLAN information to all the switches in a VTP domain. VTP advertisements can be sent over 802.1Q, and ISL

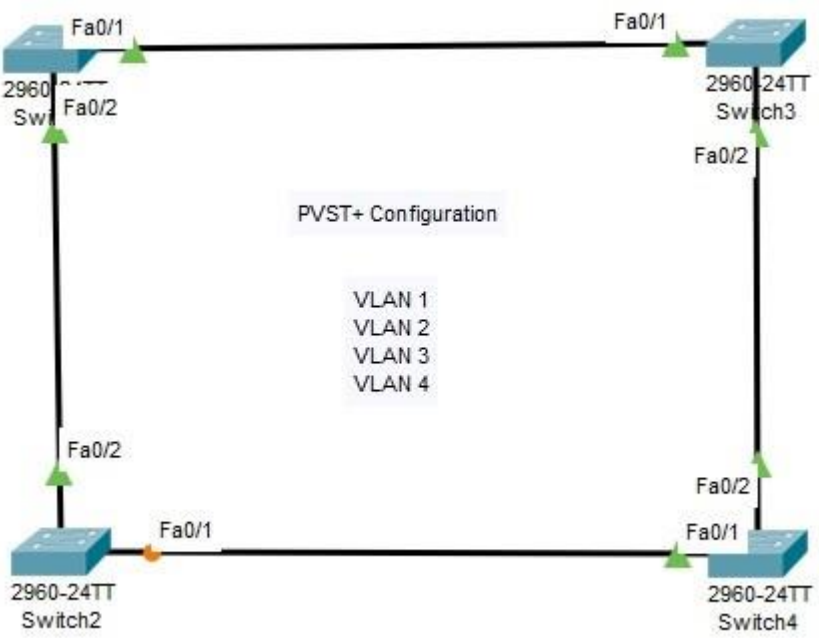
Q.19 What is spanning Tree – Mention spanning tree protocol and algorithm.

ANS. Spanning Tree Protocol (STP) is a Layer 2 network protocol used to prevent looping within a network topology. STP was created to avoid the problems that arise when computers exchange data on a local area network (LAN) that contains redundant paths. If the flow of traffic is not carefully monitored and controlled, the data can be caught in a loop that circles around network segments, affecting performance and bringing traffic to a near halt.

The spanning tree algorithm, which was developed by Radia Perlman at the Digital Equipment Corporation, is a protocol used by a set of bridges to agree upon a spanning tree for a particular extended LAN. (The IEEE 802.1 specification for LAN bridges is based on this algorithm.)

Q.20 Example of Per VLAN spanning tree.

ANS. Per VLAN Spanning Tree (PVST) is a Cisco proprietary protocol that allows a Cisco device to have multiple spanning trees. The Cisco device can interoperate with spanning trees on other PVST devices but cannot interoperate with IEEE 802.1Q devices. An IEEE 802.1Q device has all its ports running a single spanning tree.



Q.21 What is IPv6? Explain types and ip address range.

ANS. IPv6 addresses consist of 128 bits, instead of 32 bits, and include a scope field that identifies the type of application suitable for the address. IPv6 does not support broadcast addresses, but instead uses multicast addresses for broadcast. In addition, IPv6 defines a new type of address called anycast.

TPYES

Unicast

Multicast

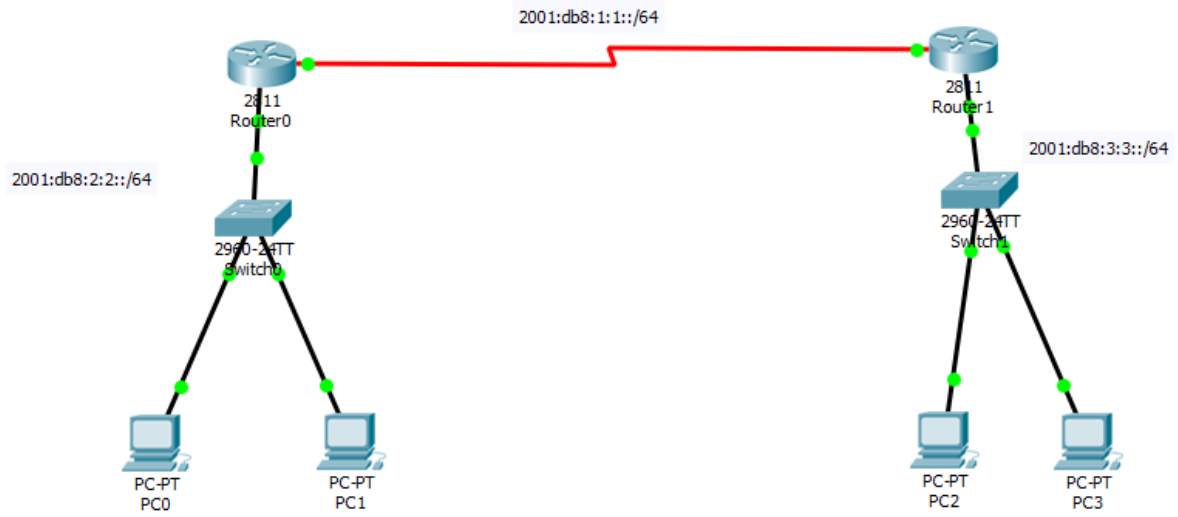
Anycast

RANGE

The IPv6 address size is 128 bits. The preferred IPv6 address representation is: x:x:x:x:x:x:x:x , where each x is the hexadecimal values of the eight 16-bit pieces of the address. IPv6 addresses range from 0000:0000:0000:0000:0000:0000:0000:0000 to ffff:ffff:ffff:ffff:ffff:ffff:ffff:ffff .

Q.22 Example of Ipv6 – RIP

ANS. the IPv6 RIP process named process1 is enabled on the router and on Gigabit Ethernet interface 0/0/0. The IPv6 default route (::/0) is advertised in addition to all other routes in router updates sent on Gigabit Ethernet interface 0/0/0.


2001:db8:1:1::/64
2811
Router0
2811
Router1
2001:db8:2:2::/64
2001:db8:3:3::/64
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3