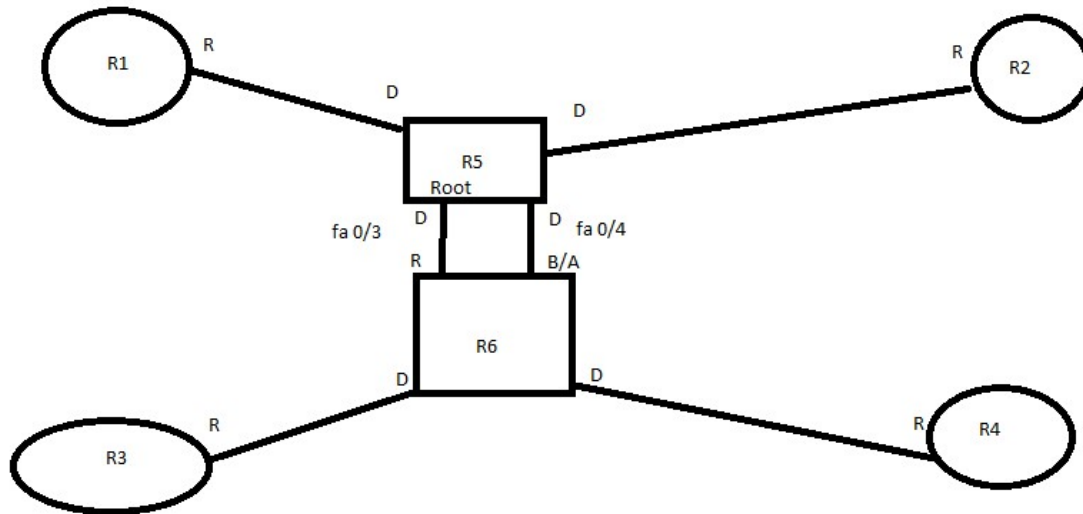


Part 1 Single Ethernet Network

1



R5 is root. To derive the spanning tree, you can use the router console commands to derive it or to derive it by hand, first we elect the root bridge. The priority is all the same, so we check the mac id address which the R5 has the lowest mac address. The root ports are based on the port with lowest path cost to the bridge. All the links are the same speed so there is a tie break between fa 0/3 and fa 0/4 which is broken based on the lowest port id. The designated port is the lowest root path cost on each link.

2.

The state are Blocking -> listening -> learning > Forwarding

From lecture:

Total waiting period is:

Maximum Age + maximum life time of a frame + maximum bridge transition delay

Hello Timer = 2sec Max Age = 20 sec Forward Delay = 15 sec

Waiting period = $2 * 15 + (0 - 20)$

The time to reach forwarding state is around 30 to 50 seconds.

3.The mechanisms involved; the router checks to see if the packet is supposed to be sent to a different network which in this case it is in the packet is supposed to send to same network. It uses arp to translate the ip address into a mac address. The router then checks the mac table and sends packet based on where the device is in the mac table.

Part 2 Vlan and Ip Routing

1. The main reason that they can not communicate is because the routers are in different vlans so they are on different networks.
2. To make the ping successful, you must ping 192.168.3.1 because that is the serial connection ip address and if you try to ping r2 with 192.168.1.2 else it will still be in different vlan.
3. It is because R3 does not know how to get to router 2 so it is not in the routing table which causes it to fail.
4. The reason the ping is not successful is because there is no way to get back from r2 to r3 since the r2 back to r3 does not have a static route.

Part 3

Static route table

Routing Table for Router1				
Type	Network	Port	Next Hop IP	Metric
C	192.168.1.0/24	GigabitEthernet0/0	---	0/0
L	192.168.1.1/32	GigabitEthernet0/0	---	0/0
S	192.168.2.0/24	---	192.168.3.2	1/0
C	192.168.3.0/24	Serial0/3/0	---	0/0
L	192.168.3.1/32	Serial0/3/0	---	0/0

Routing Table for Router2

Type	Network	Port	Next Hop IP	Metric
S	192.168.1.0/24	---	192.168.3.1	1/0
C	192.168.2.0/24	GigabitEthernet0/0	---	0/0
L	192.168.2.2/32	GigabitEthernet0/0	---	0/0
C	192.168.3.0/24	Serial0/3/0	---	0/0
L	192.168.3.2/32	Serial0/3/0	---	0/0

Routing Table for Router3

Type	Network	Port	Next Hop IP	Metric
C	192.168.1.0/24	GigabitEthernet0/0	---	0/0
L	192.168.1.3/32	GigabitEthernet0/0	---	0/0
S	192.168.2.0/24	---	192.168.1.1	1/0
S	192.168.3.0/24	---	192.168.1.1	1/0

Routing Table for Router4

Type	Network	Port	Next Hop IP	Metric
S	192.168.1.0/24	---	192.168.2.2	1/0
C	192.168.2.0/24	GigabitEthernet0/0	---	0/0
L	192.168.2.4/32	GigabitEthernet0/0	---	0/0
S	192.168.3.0/24	---	192.168.2.2	1/0

Routing Table for Router1

Type	Network	Port	Next Hop IP	Metric
C	192.168.1.0/24	GigabitEthernet0/0	---	0/0
L	192.168.1.1/32	GigabitEthernet0/0	---	0/0
R	192.168.2.0/24	Serial0/3/0	192.168.3.2	120/1
C	192.168.3.0/24	Serial0/3/0	---	0/0
L	192.168.3.1/32	Serial0/3/0	---	0/0

Routing Table for Router2

Type	Network	Port	Next Hop IP	Metric
R	192.168.1.0/24	Serial0/3/0	192.168.3.1	120/1
C	192.168.2.0/24	GigabitEthernet0/0	---	0/0
L	192.168.2.2/32	GigabitEthernet0/0	---	0/0
C	192.168.3.0/24	Serial0/3/0	---	0/0
L	192.168.3.2/32	Serial0/3/0	---	0/0

Routing Table for Router3

Type	Network	Port	Next Hop IP	Metric
C	192.168.1.0/24	GigabitEthernet0/0	---	0/0
L	192.168.1.3/32	GigabitEthernet0/0	---	0/0
R	192.168.2.0/24	GigabitEthernet0/0	192.168.1.1	120/2
R	192.168.3.0/24	GigabitEthernet0/0	192.168.1.1	120/1

Routing Table for Router4				
Type	Network	Port	Next Hop IP	Metric
R	192.168.1.0/24	GigabitEthernet0/0	192.168.2.2	120/2
C	192.168.2.0/24	GigabitEthernet0/0	---	0/0
L	192.168.2.4/32	GigabitEthernet0/0	---	0/0
R	192.168.3.0/24	GigabitEthernet0/0	192.168.2.2	120/1

1. The difference between the routing table when you use rip is the routing table has the routes to reach all the networks and as shown from the routing table above R type means the route was obtained from rip protocol. Before the route protocol, the routers only have the devices directly connected to itself. RIP takes time before all the routing table are filled because of travel time.