

TNE20003 – Internet and Cybersecurity for Engineering Applications

Understanding Routers & Routing Tables

Aims:

- To understand the purpose of routers in a network
- To investigate how routing tables work and what function they serve.

Preparation:

- View "[Network Devices - Routers and Switches](#)"

Due Date:

- Nil. In-class activity.

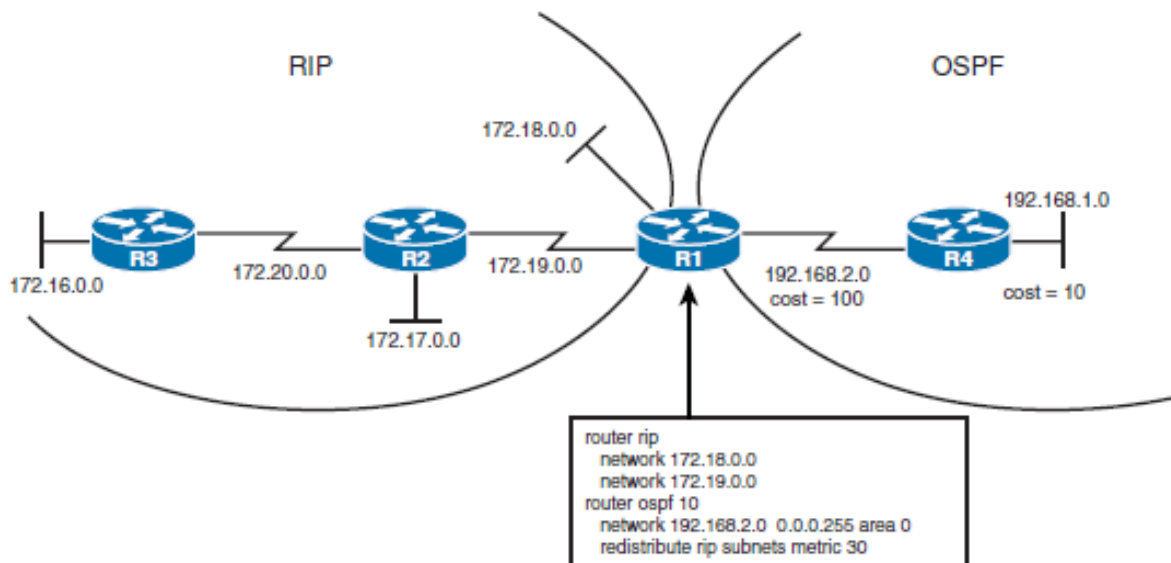
List 2 functions of a router in a network.

```
HQ# show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       + - replicated route, % - next hop override

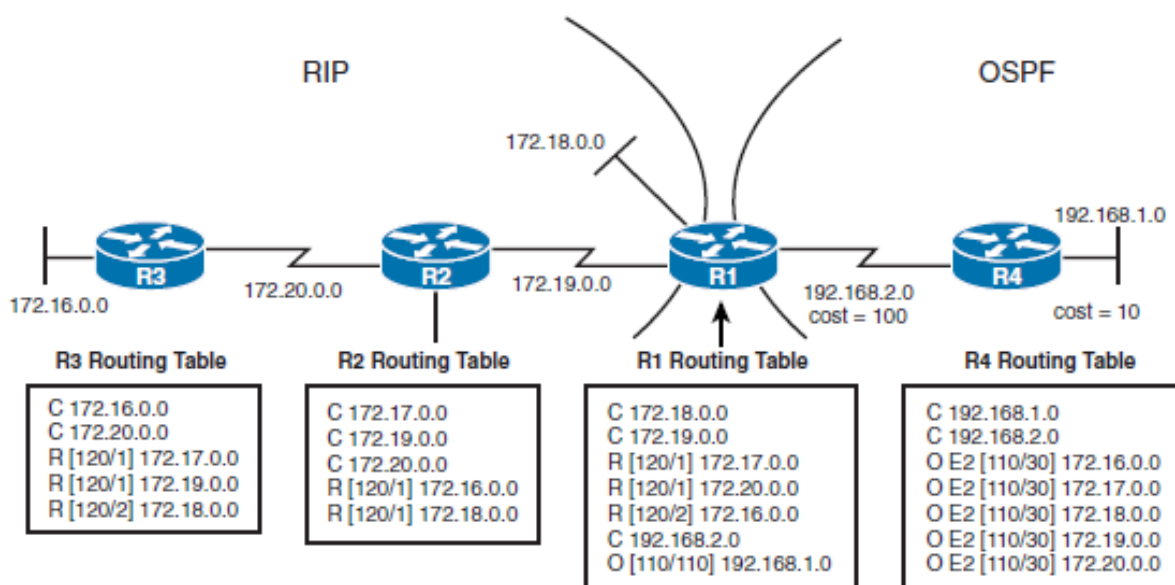
Gateway of last resort is not set

    10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.1.0.0/16 is directly connected, Loopback0
L       10.1.0.1/32 is directly connected, Loopback0
    172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.16.1.0/30 is directly connected, Ethernet0/0
L       172.16.1.1/32 is directly connected, Ethernet0/0
D       192.168.0.0/24 [90/409600] via 172.16.1.2, 00:12:07, Ethernet0/0
D       192.168.16.0/23 [90/307200] via 172.16.1.2, 00:12:07, Ethernet0/0
D EX    192.168.18.0/24 [170/307200] via 172.16.1.2, 00:12:07, Ethernet0/0
```

The network below is connected and configured. It is allowed to reach equilibrium, meaning steady state where all devices have told each other about everything they know.



The resulting routing tables are:



What do you notice about each of the boxes?

Can R4 communicate with any of the networks connected to R1?

Can R3 communicate with any of the networks connected to R1?

Can R3 communicate with any of the networks connected to R4?

Can R4 communicate with any of the networks connected to R3?

