

Dynamic Routing Protocols

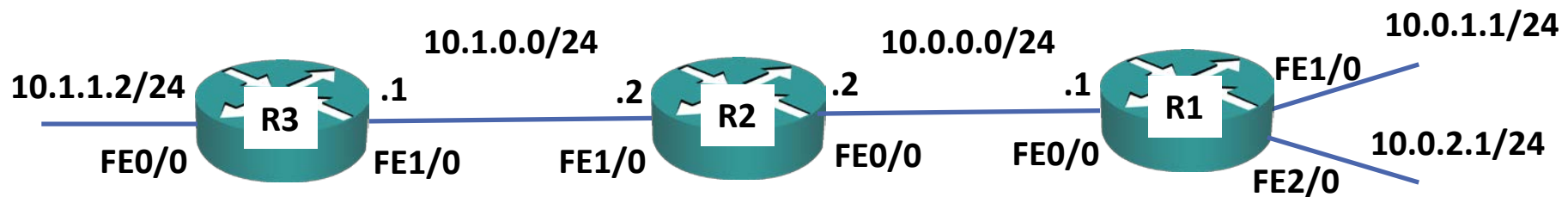
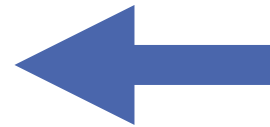


- When a routing protocol is used, routers automatically advertise their best paths to known networks to each other.
- Routers use this information to determine their own best path to the known destinations.
- When the state of the network changes, such as a link going down or a new subnet being added, the routers update each other.
- Routers will automatically calculate a new best path and update the routing table if the network changes.

Dynamic Routing Protocols



- You can get to these networks via me:
10.0.1.0/24
10.0.2.0/24



Dynamic Routing Protocols



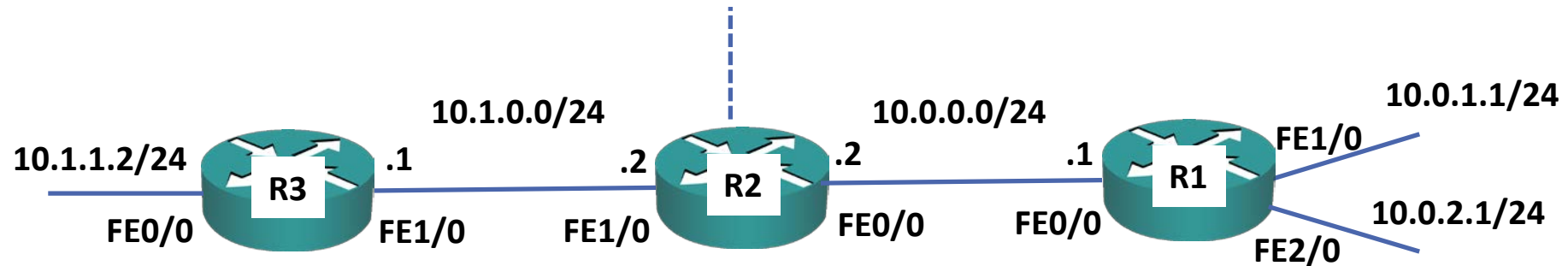
- Routing Table:

10.0.0.0/24 Connected FE0/0

10.1.0.0/24 Connected FE1/0

10.0.1.0/24 10.0.0.1 FE0/0

10.0.2.0/24 10.0.0.1 FE0/0



Dynamic Routing Protocols

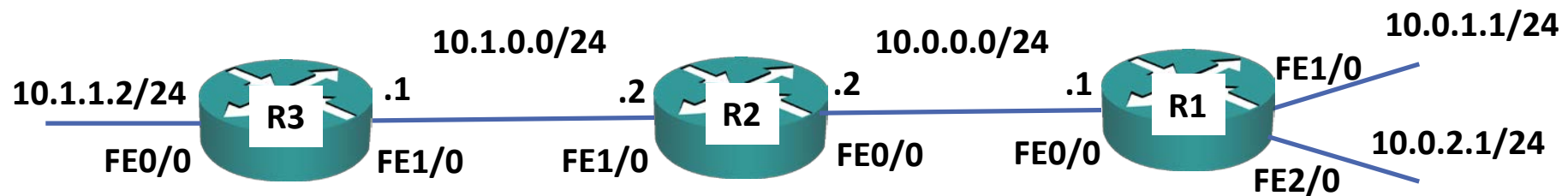
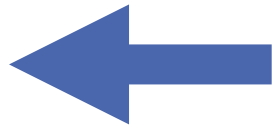


- You can get to these networks via me:

10.0.0.0/24

10.0.1.0/24

10.0.2.0/24



Dynamic Routing Protocols



- Routing Table:

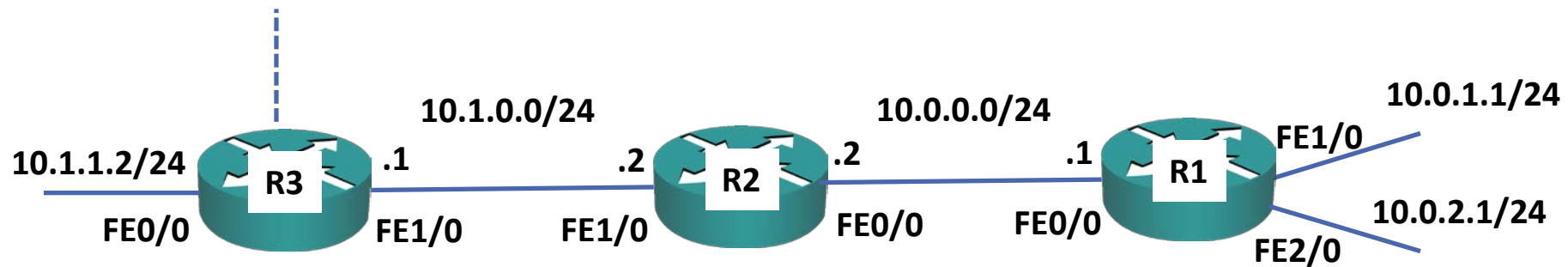
10.1.1.0/24 Connected FE0/0

10.1.0.0/24 Connected FE1/0

10.0.0.0/24 10.1.0.2 FE1/0

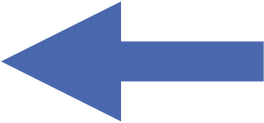
10.0.1.0/24 10.1.0.2 FE1/0

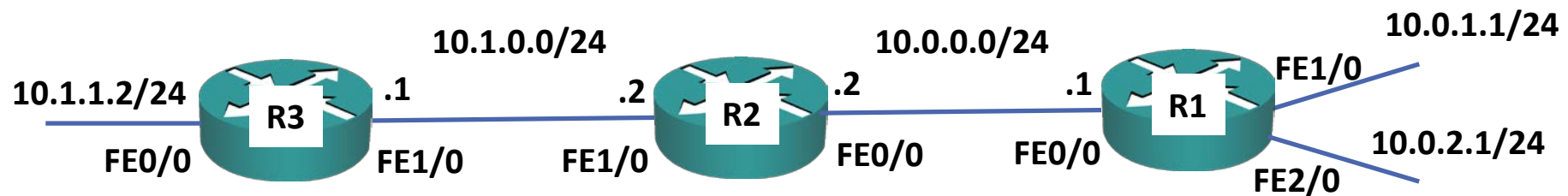
10.0.2.0/24 10.1.0.2 FE1/0



Summary Routes



- You can get to these networks via me:
10.0.0.0/16
- 



Summary Routes



- Summary routes lead to less memory usage in routers as their routing tables contain less routes
- They also lead to less CPU usage as changes in the network only affect other routers in the same area
- For example, if the link on R1 to the 10.0.1.1/24 network goes down, R2 will lose its route there and try to compute a new path
- R3 will not be affected as its summary route to 10.0.0.0/16 is unchanged

Dynamic Routing Protocols vs Static Routes

- Routing protocols are more scalable than administrator defined static routes.
- Using purely static routes is only feasible in very small environments.

Dynamic Routing Protocol Advantages

- The routers automatically advertise available subnets to each other without the administrator having to manually enter every route on every router.
- If a subnet is added or removed the routers will automatically discover that and update their routing tables.
- If the best path to a subnet goes down routers automatically discover that and will calculate a new best path if one is available.

Dynamic Routing Protocols vs Static Routes

- Using a combination of a dynamic routing protocol and static routes is very common in real world environments.
- In this case the routing protocol will be used to carry the bulk of the network information.
- Static routes can also be used on an as needed basis. For example for backup purposes or for a static route to the Internet (which will typically be injected into the dynamic routing protocol and advertised to the rest of the routers.)

Lab

