

IPv6 Routing



- IPv6 routing works the same way as IPv4 routing, but the processes are separate, and there are separate IPv4 and IPv6 routing tables
- If a router receives an IPv4 packet, it will route it according to its IPv4 routing table
- If a router receives an IPv6 packet, it will route it according to its IPv6 routing table
- The routing tables are built in the same way, through static routes or dynamic routing protocols

IPv6 Routing



- IPv4 routing is enabled by default on a Cisco IOS router
- IPv6 routing is disabled by default
- Enter the command `'ipv6 unicast-routing'` to enable it
- You can still configure IPv6 addresses on a router without ipv6 unicast-routing enabled and send and receive IPv6 traffic, but the router will not forward IPv6 traffic to other networks

Connected and Local Routes



- The administrator configures IP addresses on the router's interfaces

```
R1#show run
```

```
interface FastEthernet0/0
  ip address 10.10.1.1 255.255.255.0
  duplex full
  ipv6 address 2001:DB8:0:1::1/64
!
interface FastEthernet2/0
  ip address 10.10.0.1 255.255.255.0
  duplex full
  ipv6 address 2001:DB8::1/64
```

show ip route – IPv4 Routes



- This will automatically enter connected and local routes in the routing table.
- Local IPv4 routes always have a /32 mask and show the IP address configured on the interface

```
R1#show ip route
```

```
C          10.10.0.0/24 is directly connected, FastEthernet2/0
C          10.10.1.0/24 is directly connected, FastEthernet0/0
L          10.10.0.1/32 is directly connected, FastEthernet2/0
L          10.10.1.1/32 is directly connected, FastEthernet0/0
! truncated
```

show ipv6 route - Connected Routes

- Local routes always have a /128 mask and show the IP address configured on the interface

```
R1#show ipv6 route
C    2001:DB8::/64 [0/0]
      via FastEthernet2/0, directly connected
C    2001:DB8:0:1::/64 [0/0]
      via FastEthernet0/0, directly connected
L    2001:DB8::1/128 [0/0]
      via FastEthernet2/0, receive
L    2001:DB8:0:1::1/128 [0/0]
      via FastEthernet0/0, receive
! truncated
```

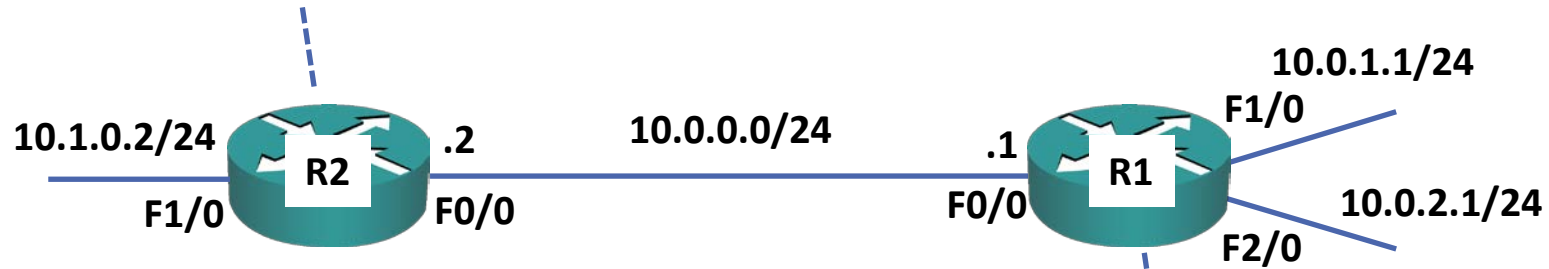
Routing



- If a router receives traffic for a network which it is not directly attached to, it needs to know how to get there in order to forward the traffic
- An administrator can manually add a static route to the destination, or the router can learn it via a routing protocol

IPv4 Static Routes

```
ip route 10.0.1.0 255.255.255.0 10.0.0.1  
ip route 10.0.2.0 255.255.255.0 10.0.0.1
```



```
ip route 10.1.0.0 255.255.255.0 10.0.0.2
```

IPv6 Static Routes

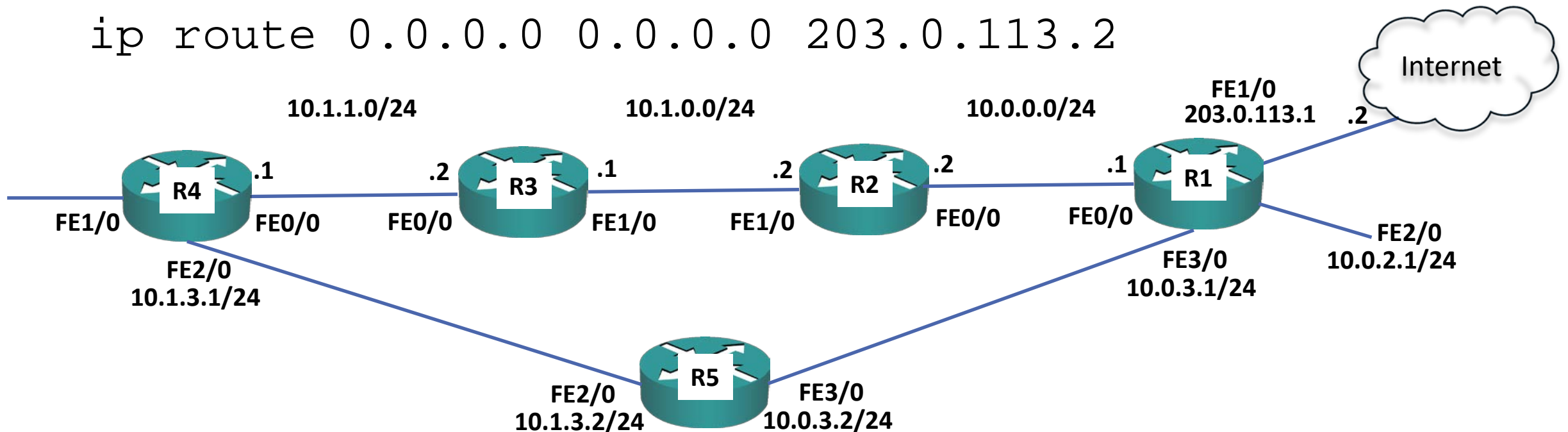
```
ipv6 route 2001:DB8:0:2::/64 2001:DB8:0:1::1  
ipv6 route 2001:DB8:0:3::/64 2001:DB8:0:1::1
```



```
ipv6 route 2001:DB8::/64 2001:DB8:0:1::2
```


IPv4 Summary and Default Route

```
ip route 10.1.0.0 255.255.0.0 10.0.0.2
ip route 10.1.3.0 255.255.255.0 10.0.3.2
ip route 0.0.0.0 0.0.0.0 203.0.113.2
```

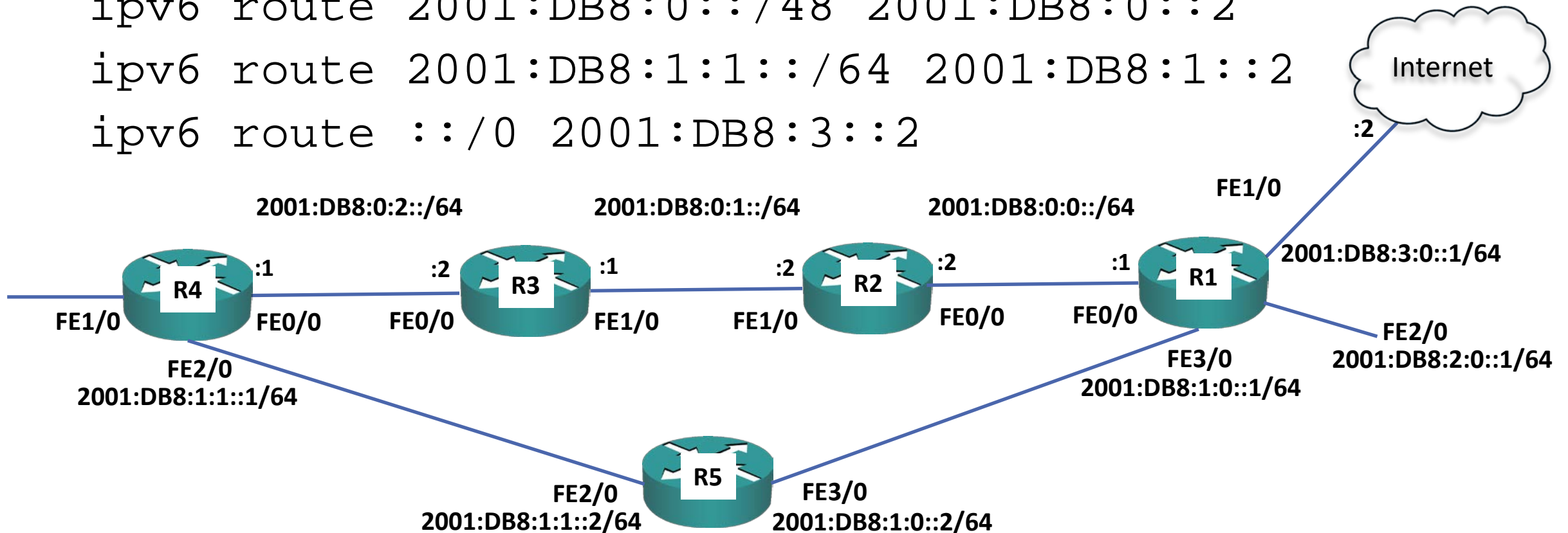


IPv6 Summary and Default Route

```
ipv6 route 2001:DB8:0:::/48 2001:DB8:0:::2
```

```
ipv6 route 2001:DB8:1:1:::/64 2001:DB8:1:::2
```

```
ipv6 route ::/0 2001:DB8:3:::2
```



Lab

