

# IPv6 Address Types



- Global Unicast
- Unique Local
- Link Local

# IPv6 Address Types: Global Unicast Addresses

- Global Unicast Addresses are similar to IPv4 public addresses
- They are assigned to an individual host and have global reachability (unless blocked by security policy such as on a firewall)
- They are assigned from the range 2000::/3

# IPv6 Address Types: Global Unicast Addresses

- Internet authorities assign blocks from the overall 2000::- A common assignment for a company is a /48 block, eg 2001:10:10::- A smaller or larger size block can be assigned depending on the size of the company

# IPv6 Address Types: Global Unicast Addresses

- IPv6 standards state that addresses assigned to individual hosts should use a /64 mask
- The IPv6 address is 128 bits so /64 splits it in half for the network and host portions of the address
- X:X:X:X:X:X:X:X  
Network | Host

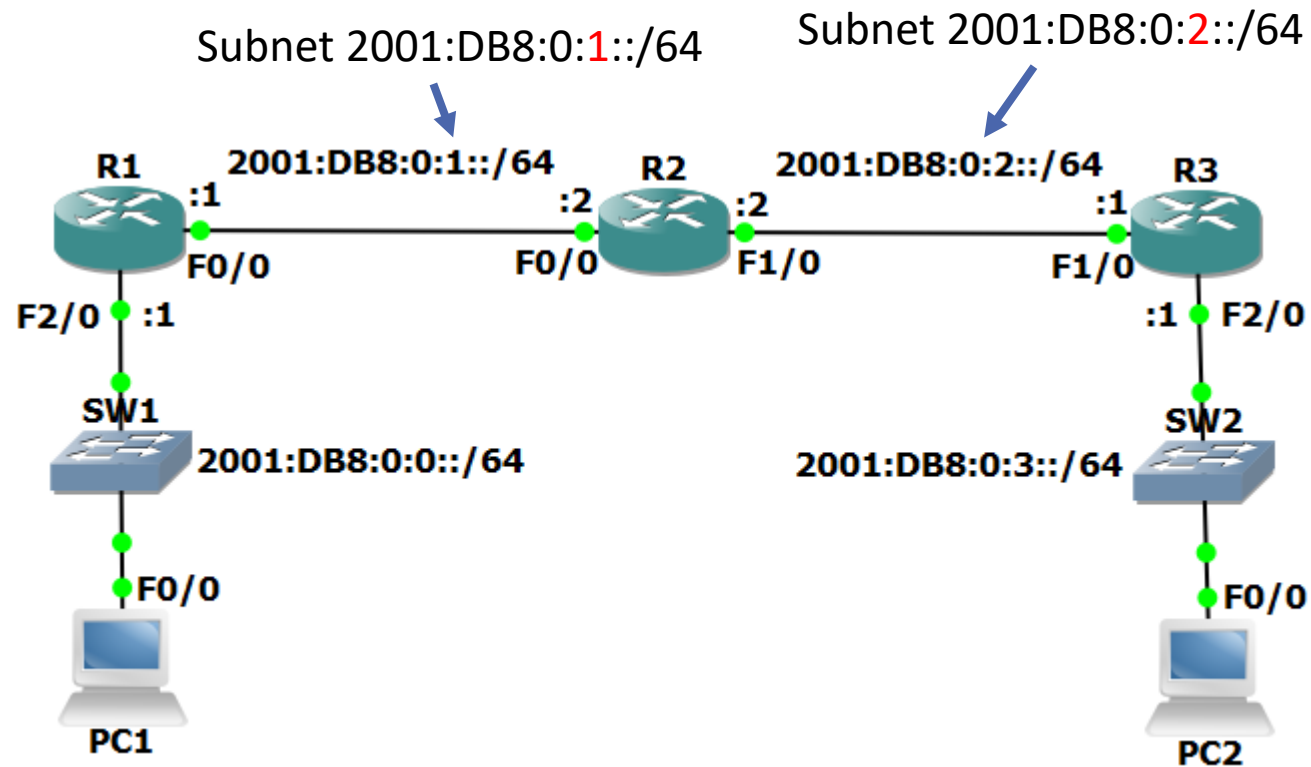
# IPv6 Address Types: Global Unicast Addresses

- If a company is assigned a /48 address by the Internet authorities and uses /64 host addresses, that leaves 16 bits the company can assign to its internal subnets
- For example, if the company was assigned 2001:10:10::/48 by the Internet authorities, it can assign subnets 2001:10:10:0::/64 to 2001:10:10:FFFF::/64 to its internal network segments
- 16 bits = 65,535 possible subnets
- 64 bits left over = 18,446,744,073,709,551,616 hosts per subnet
- X:X:X:X:X:X:X:X

Company | ↑ | Host  
          |    |  
          Subnet

# IPv6 Address Types: Global Unicast Addresses

- In this example the company has been assigned 2001:DB8:0::/48 by the Internet authorities

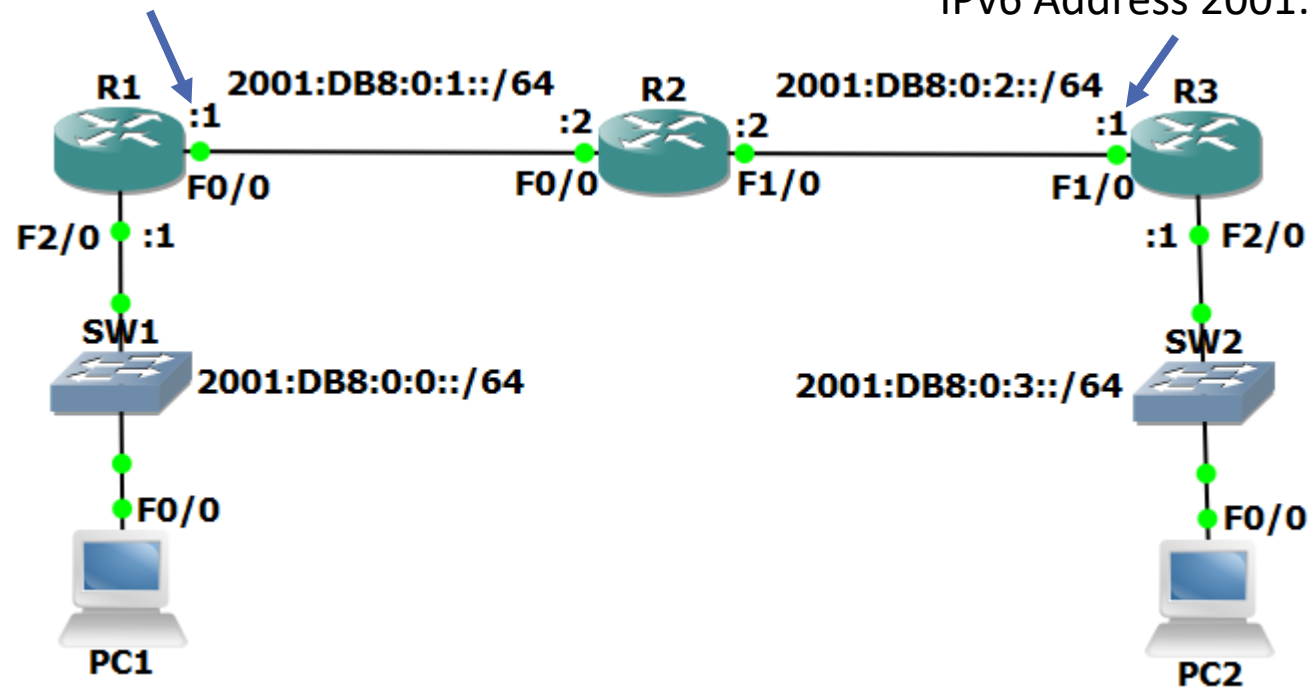


# IPv6 Address Types: Global Unicast Addresses

- In this example the company has been assigned 2001:DB8:0::/48 by the Internet authorities

IPv6 Address 2001:DB8:0:1:0:0:0:1/64

IPv6 Address 2001:DB8:0:2:0:0:0:1/64

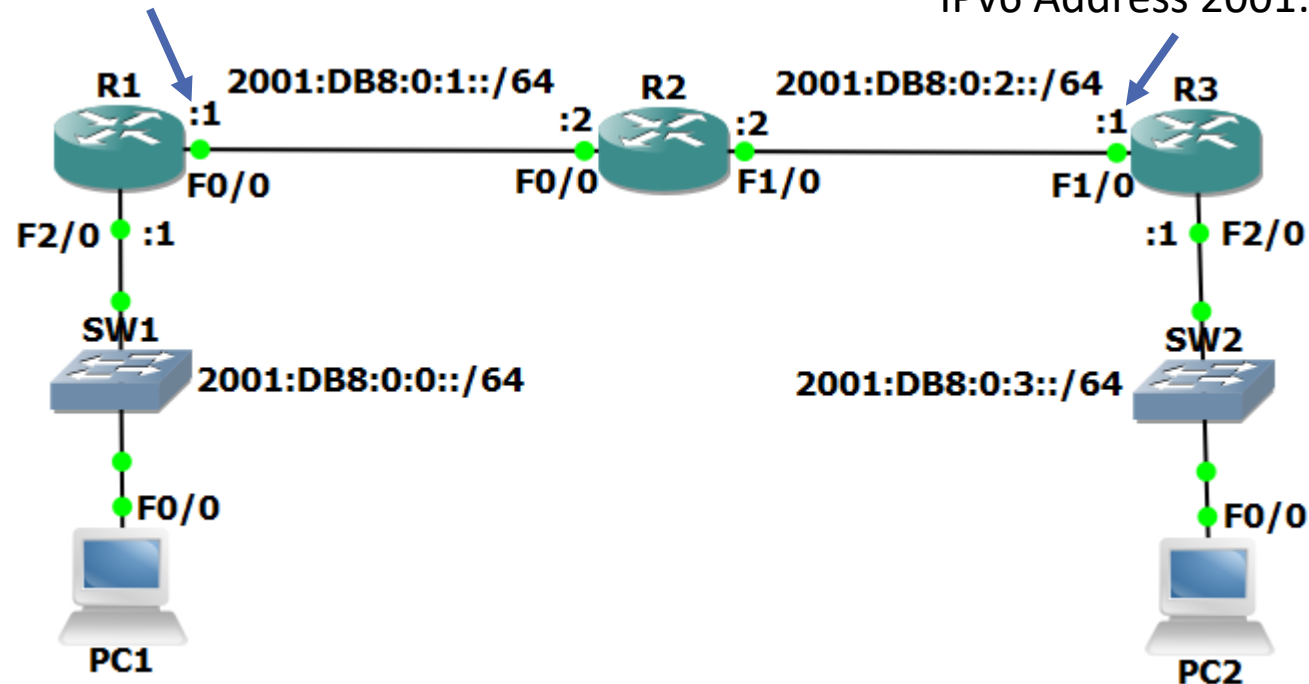


# IPv6 Address Types: Global Unicast Addresses

- In this example the company has been assigned 2001:DB8:0::/48 by the Internet authorities

IPv6 Address 2001:DB8:0:1::1/64

IPv6 Address 2001:DB8:0:2::1/64





# IPv6 Address Types: Global Unicast Addresses

- Using a /64 for all network subnets including point-to-point links and loopback addresses can seem wasteful, but the official declaration is that the IPv6 address space is so large that it does not create a problem
- Using /64 everywhere simplifies the addressing and enables the use of EUI-64 addresses

# Global Unicast Address Configuration

- Enable IPv6 routing first

```
R1(config)#ipv6 unicast-routing
```

```
R1(config-if)#int f0/0
```

```
R1(config-if)#ipv6 add 2001:db8:0:1::1/64
```

```
R1(config-if)#int f2/0
```

```
R1(config-if)#ipv6 add 2001:db8:0:0::1/64
```