Stateless Address AutoConfiguration (SLAAC)

- Hosts can be assigned IPv6 addresses through static addressing, DHCPv6, or SLAAC

- DHCP servers track their MAC address to IP address assignments, so this is 'stateful' addressing

Stateless Address AutoConfiguration (SLAAC)

- With SLAAC, hosts learn the /64 subnet their interface is on from their local router and then use this information to generate their own IPv6 EUI-64 address

- (Modern Operating Systems randomise the host portion of the address rather than using standard EUI-64 for privacy reasons)

- The router does not track which hosts have which IP address so this is 'stateless' addressing

# SLAAC – Router Advertisements

- When a global unicast IPv6 address is configured on an interface then Router Advertisements advertising the network prefix are sent out by default

- These ICMP messages are sent to the 'All Nodes' multicast address from the interface's link-local address

- Hosts can also send a 'Router Solicitation' message to request the information

Stateless Address AutoConfiguration (SLAAC)

- As well as telling the hosts which subnet to generate their IP address on, the router tells the hosts to use itself as their default gateway

- The original implementation did not support any information other than the default gateway address

Stateless Address AutoConfiguration (SLAAC)
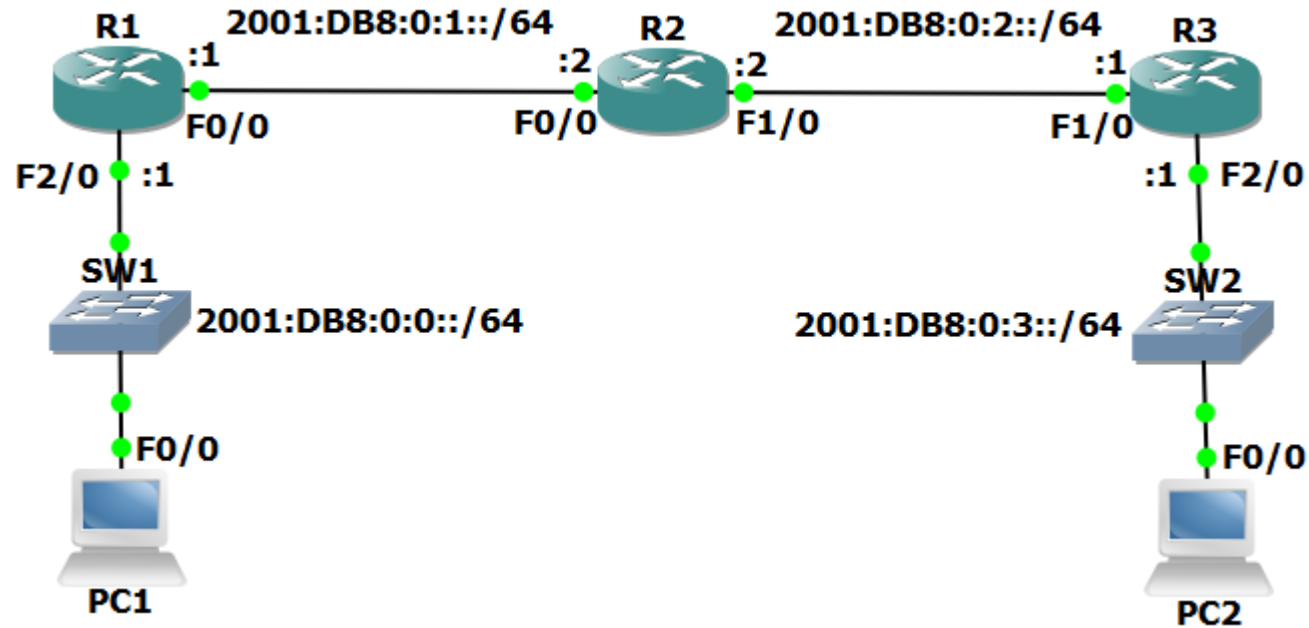
Stateless Address AutoConfiguration (SLAAC)

- In practice a DHCP server is still required to give out information such as DNS server

- If the IP address is assigned by SLAAC and the DNS server is assigned by DHCP this results in a stateless configuration, where the DHCP server does not retain information about the hosts

The Unspecified Address

- :: is the Unspecified address or Unknown address
- An IPv6 route to ::/0 is a default route equivalent to 0.0.0.0 0.0.0.0 in IPv4
- Also, :: is used as the source when an interface is trying to acquire an address

Neighbor Discovery

- Neighbor Discovery is the IPv6 version of ARP and works in the same way

- Rather than using ARP requests and replies, Neighbor Discovery uses ICMP Neighbor Solicitations and Neighbor Advertisements

- Neighbor Solicitation messages are sent to the Solicited-Node multicast address which reaches all hosts on the subnet

Verification – show ipv6 neighbors
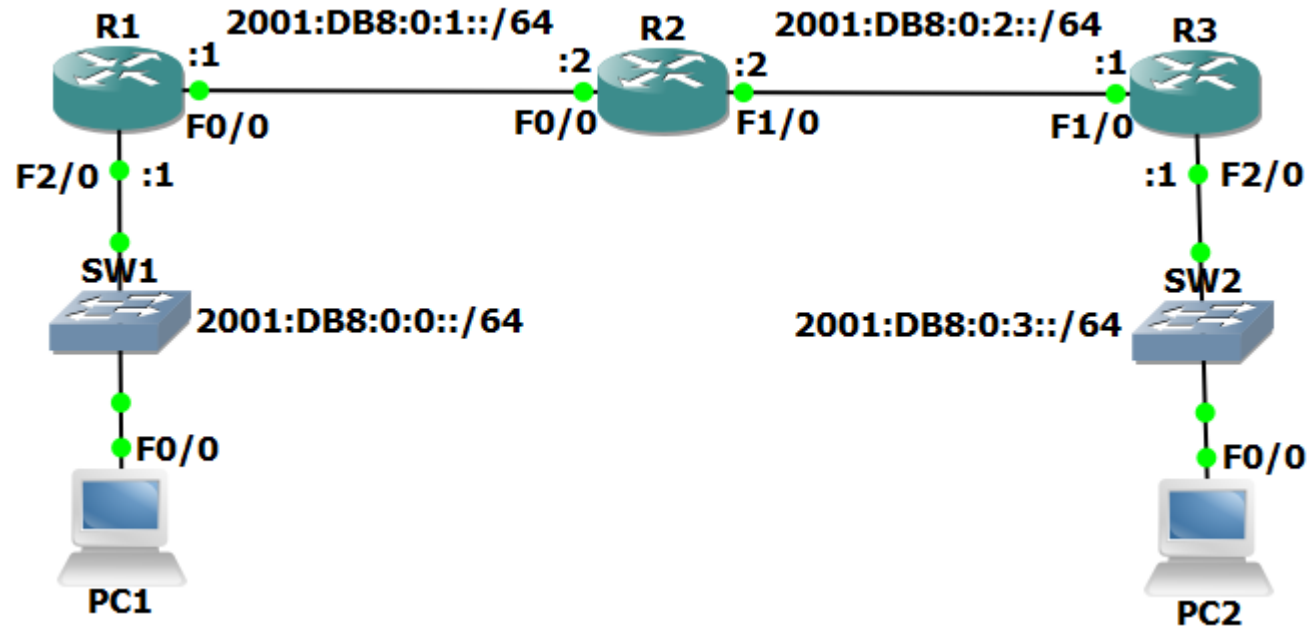
Verification – show ipv6 neighbors

```
R2#show ipv6 neighbors
IPv6 Address                                    Age Link-layer Addr State Interface
FE80::C801:2FFF:FE24:0                             0 ca01.2f24.0000  STALE Fa0/0
FE80::C803:2DFF:FEB0:1C                            0 ca03.2db0.001c  STALE Fa1/0

R2#ping 2001:db8:0:1::1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2001:DB8:0:1::1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 16/32/88 ms

R2#show ipv6 neighbors
IPv6 Address                                    Age Link-layer Addr State Interface
FE80::C801:2FFF:FE24:0                             0 ca01.2f24.0000  STALE Fa0/0
2001:DB8:0:1::1                                    0 ca01.2f24.0000  REACH Fa0/0
FE80::C803:2DFF:FEB0:1C                            0 ca03.2db0.001c  STALE Fa1/0
```