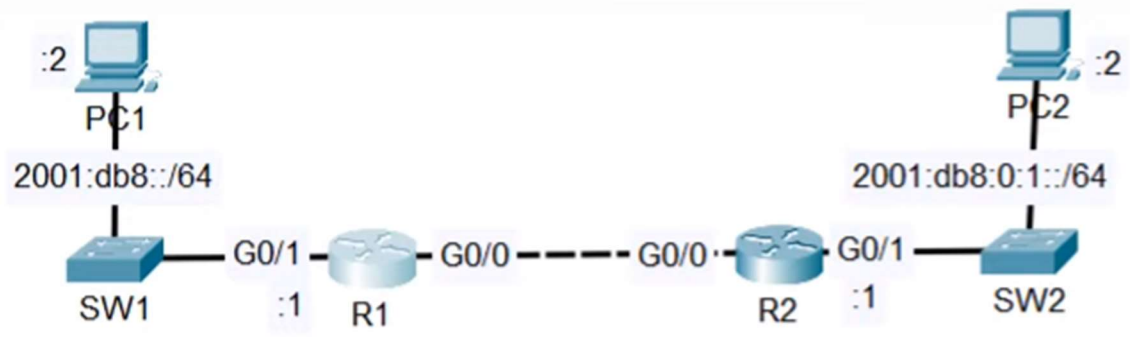
Day 32 LAB



Interfaces are enabled and configured with IPv4.
You will configure IPv6 in the network.

1. Use EUI-64 to configure IPv6 addresses on G0/1 of R1/R2
   *Before configuring the addresses, calculate the EUI-64 interface ID that will be generated on each interface.

2. Configure the appropriate IPv6 addresses/default gateways on PC1 and PC2.

3. Enable IPv6 on G0/0 of R1/R2 without explicitly configuring an IPv6 address.

4. Configure static routes on R1/R2 to enable PC1 to ping PC2.
   Use the 'ipv6 route' command with '?' to learn how to use the command.
   *We will study IPv6 static routes in depth in Day 33.

1. Use EUI-64 to configure IPv6 addresses on G0/1 of R1/R2
   *Before configuring the addresses, calculate the EUI-64 interface ID that will be generated on each interface.

```
R1>
R1>en
R1>enable
R1#show int
R1#show interfaces g0/1
GigabitEthernet0/1 is up, line protocol is up (connected)
  Hardware is CN Gigabit Ethernet, address is 0030.f236.4502 (bia 0030.f236.4502)
  Internet address is 10.0.1.254/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
```

Calculate EU-64:

R1 G0/1
MAC: 0030.f236.4502

0030.f2 36.4502

0030.f2ff fe36.4502

0230.f2ff.fe36.4502

2001:db8::230:f2ff:fe36:4502/64

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#ipv6 uni
R1(config)#ipv6 unicast-routing
R1(config)#int g0/1
R1(config-if)#ipv6 add
R1(config-if)#ipv6 address 2001:db8::/64 ?
  anycast  Configure as an anycast
  eui-64   Use eui-64 interface identifier
  <cr>
R1(config-if)#ipv6 address 2001:db8::/64 eui-64
R1(config-if)#do sh ipv6 int br
GigabitEthernet0/0         [up/up]
    unassigned
GigabitEthernet0/1         [up/up]
    FE80::230:F2FF:FE36:4502
    2001:DB8::230:F2FF:FE36:4502
GigabitEthernet0/2         [administratively down/down]
    unassigned
Vlan1                      [administratively down/down]
    unassigned
R1(config-if)#
```

Notice a Link-local IPv6 address was also configured just above it and it uses the same EUI-64 address in the last 64 bits of the Link-local address (with prefix FE80:: before it, signifying a link-local address):

FE80::230:F2FF:FE36:4502

R2:

```
R2#show int g0/1
GigabitEthernet0/1 is up, line protocol is up (connected)
  Hardware is CN Gigabit Ethernet, address is 0001.63b0.b802 (bia 0001.63b0.b802)
  Internet address is 10.0.2.254/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
```

Calculate EU-64:

R2: G0/1
MAC: 0001.63b0.b802

0001.63 b0.b802

0001.63ff feb0.b802

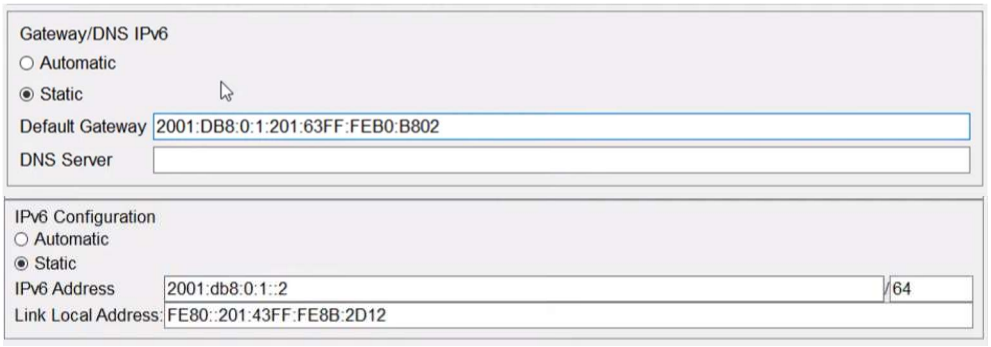
0201.63ff.feb0.b802

2001:db8:0:1:201:63ff:feb0:b802

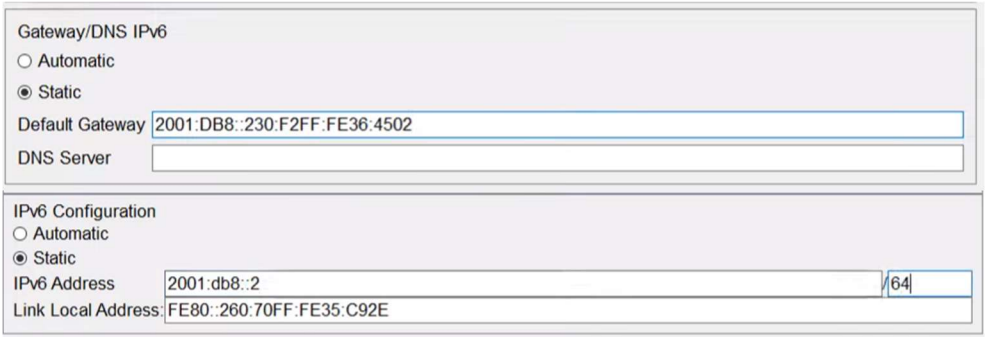
```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#ipv6 uni
R2(config)#ipv6 unicast-routing
R2(config)#int g0/1
R2(config-if)#ipv6 add
R2(config-if)#ipv6 address 2001:db8:0:1::/64 eui-64
R2(config-if)#do sh ipv6 int br
GigabitEthernet0/0         [up/up]
    unassigned
GigabitEthernet0/1         [up/up]
    FE80::201:63FF:FEB0:B802
    2001:DB8:0:1:201:63FF:FEB0:B802
GigabitEthernet0/2         [administratively down/down]
    unassigned
Vlan1                      [administratively down/down]
    unassigned
R2(config-if)#
```

2. Configure the appropriate IPv6 addresses/default gateways on PC1 and PC2.

PC1:



PC2:



3. Enable IPv6 on G0/0 of R1/R2 without explicitly configuring an IPv6 address.

R1:

```
R1(config-if)#int g0/0
R1(config-if)#ipv6 ?
  address           Configure IPv6 address on interface
  authentication    authentication subcommands
  dhcp              IPv6 DHCP interface subcommands
  eigrp             Configure EIGRP IPv6 on interface
  enable            Enable IPv6 on interface
  flow              NetFlow Related commands
  hello-interval    Configures IP-EIGRP hello interval
  mtu               Set IPv6 Maximum Transmission Unit
  nat               Enable IPv6 NAT on interface
  nd                IPv6 interface Neighbor Discovery subcommands
  ospf              OSPF interface commands
  rip               Configure RIP routing protocol
  summary-address   Summary prefix
  traffic-filter    Access control list for packets
  unnumbered        Preferred interface for source address selection
R1(config-if)#ipv6 enable
R1(config-if)#do sh ipv6 int br
GigabitEthernet0/0          [up/up]
    FE80::230:F2FF:FE36:4501
GigabitEthernet0/1          [up/up]
    FE80::230:F2FF:FE36:4502
    2001:DB8::230:F2FF:FE36:4502
GigabitEthernet0/2          [administratively down/down]
    unassigned
Vlan1                       [administratively down/down]
    unassigned
R1(config-if)#
```

R2:

```
R2(config-if)#int g0/0
R2(config-if)#ipv6 en
R2(config-if)#ipv6 enable
R2(config-if)#do sh ipv6 int br
GigabitEthernet0/0          [up/up]
    FE80::201:63FF:FEB0:B801
GigabitEthernet0/1          [up/up]
    FE80::201:63FF:FEB0:B802
    2001:DB8:0:1:201:63FF:FEB0:B802
GigabitEthernet0/2          [administratively down/down]
    unassigned
Vlan1                       [administratively down/down]
    unassigned
R2(config-if)#
```

4. Configure static routes on R1/R2 to enable PC1 to ping PC2.
Use the 'ipv6 route' command with '?' to learn how to use the command.
*We will study IPv6 static routes in depth in Day 33.

Copy the Link-local address from R2 and use it when configuring an entry in R1s IPv6 routing table:

```
R1(config-if)#
R1(config-if)#exit
R1(config)#ipv6 route ?
  X:X:X:X::X/<0-128>  IPv6 prefix
R1(config)#ipv6 route 2001:db8:0:1::/64 ?
  Dialer            Dialer interface
  Ethernet          IEEE 802.3
  FastEthernet      FastEthernet IEEE 802.3
  GigabitEthernet   GigabitEthernet IEEE 802.3z
  Loopback          Loopback interface
  Serial            Serial
  Vlan              Catalyst Vlans
  X:X:X:X::X        IPv6 address of next-hop
R1(config)#ipv6 route 2001:db8:0:1::/64 FE80::201:63FF:FEB0:B801
% Interface has to be specified for a link-local nexthop
R1(config)#ipv6 route 2001:db8:0:1::/64 FE80::201:63FF:FEB0:B801 ?
  <1-254>  Administrative distance
  <cr>
R1(config)#ipv6 route 2001:db8:0:1::/64 g0/0 FE80::201:63FF:FEB0:B801
R1(config)#
```

R2:

Copy the Link-local address from R1 and use it when configuring an entry in R2s IPv6 routing table:

```
R2(config-if)#
R2(config-if)#exit
R2(config)#
R2(config)#ipv6 route 2001:db8::/64 g0/0 FE80::230:F2FF:FE36:4501
R2(config)#
```

Test your IPv6 routes by pinging from PC1 to PC2:

```
Ping 2001:db8:0:1::2
```

And its successful!