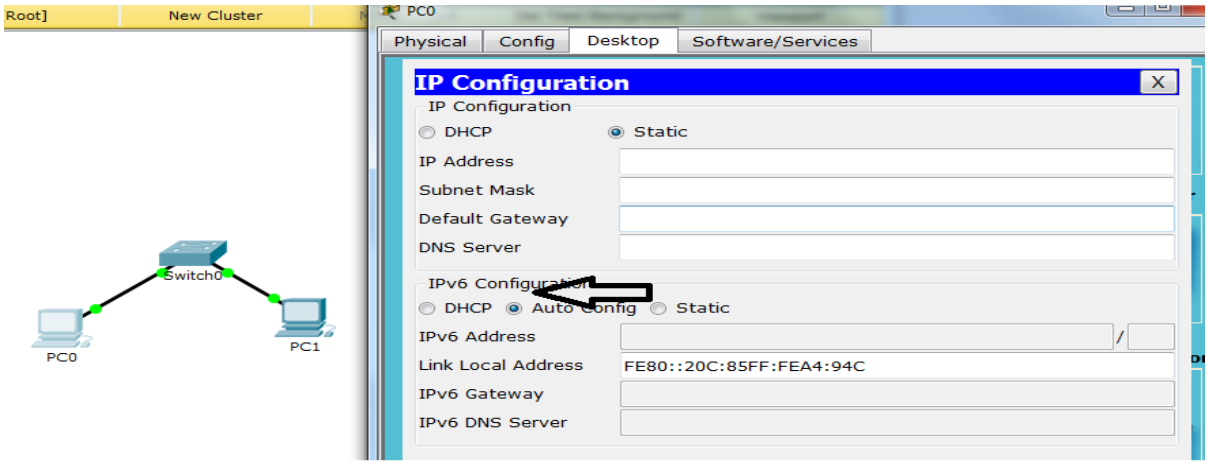
Lab 9: IPv6.

Most of the IPv6 here can be done via PT 6.0 and above. If you do it on real device, you may need to deal with PC Operating System issues such as WinXP and Windows 7 etc.

1. **Direct connection without any routers using auto configuration.**



Ping the other PC using the link local address.

PC0	PC1
C:>ipv6config /all Fast Ethernet0 Connection: (Default port) Physical Address : 000c:85a4:034c Link-local IPv6 Address : FE80::20c:86FF:FEA4:94C IPv6 Address : ::/20 Default Gateway : :: DNS Servers : :: DHCPv6 Client DUID : 00-01-00-01-A4-3A-01-82-00-0c-85-A4-09-4c	C:> ping FE80::20c:86FF:FEA4:94C Pinging FE80::20c:86FF:FEA4:94C with 32 bytes of data: Replying from FE80::20c:86FF:FEA4:94C bytes =32 times= 1ms Replying from FE80::20c:86FF:FEA4:94C bytes =32 times= 1ms Replying from FE80::20c:86FF:FEA4:94C bytes =32 times= 1ms Replying from FE80::20c:86FF:FEA4:94C bytes =32 times= 1ms C:>

You should get a ping respond.

1.2 Configure the PC with a static IPv6 address. Repeat the above process using static IPv6 address

PC0: ip address 2001:0:0:0:0:0:0:1 / 64
PC1: ip address 2001:0:0:0:0:0:0:2 / 64

To check the ipv6 address at a PC, type

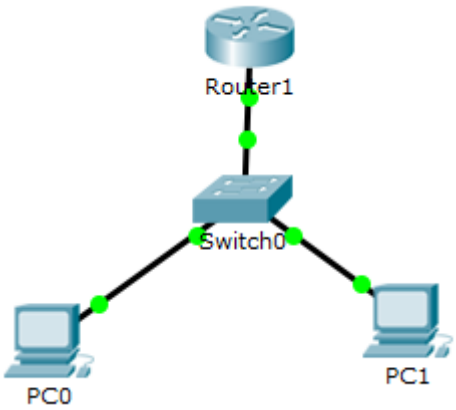
- ***ipv6config***

At PC0 command prompt, you should type

- ***ping 2001:0:0:0:0:0:0:2***

and you should be able to get a respond.

2. Static IPv6 addressing.



Add a router into the above topology, configure the g0/0 interface at Router1 with an IPv6 address of 2001:0:0:0:0:0:0:fe/64.
Write down the command for IPv6 configuration at Router1.

_____

_____

_____

_____

_____

_____

- ***ping 2001:0:0:0:0:0:0:2***

from router1.

You should be able to get a respond.

2.1 Router provided IPv6 addressing.

Change the PC0, PC1 and Router ip addressing to auto-config.
Fill in the blank below

PC0 IPv6 address	
PC0 Link Local Address	
PC0 IPv6 Default Gateway	
PC1 IPv6 address	
PC1 Link Local Address	
PC1 IPv6 Default Gateway	

Write down the output (1st 11 lines) for
#show ipv6 interface g0/0

What is your conclusion?

2.2 Router provided IPv6 addressing eui-64. (you cannot see the difference in packet tracer because packet tracer link local address for PC is using FF:FE). Skip this part if you are doing Packet Tracer.

Change the PC0 and PC1, ip addressing to auto-config. Configure the IPv6 interface at router1 (2911) int g0/0 to be eui-64 format. Write down the command.

Fill in the blank below

PC0 IPv6 address	2001::20C:85FF:FEA4:94C
PC0 Link Local Address	FE80::20C:85FF:FEA4:94C
PC0 IPv6 Default Gateway	FE80::260:5CFF:FE50:1301
PC1 IPv6 address	2001::201:63**FF:FE**28:56B8
PC1 Link Local Address	FE80::201:63FF:FE28:56B8
PC1 IPv6 Default Gateway	FE80::260:5CFF:FE50:1301

Write down the output (1st 11 lines) for
#show ipv6 interface g0/0

What is your conclusion?

2.3 Router provided IPv6 addressing and DHCP server to PC. (does not work with Packet Tracer)

Change the PC0 and PC1, ip addressing to DHCP.

```
!
ipv6 unicast-routing
!
ipv6 dhcp pool cisco
 prefix-delegation pool cisco-new
!
ipv6 local pool client-prefix 2001::1/40 64
!
interface f0/0
 no ip address
 duplex auto
 speed auto
 ipv6 address 2001::1/64
 ipv6 dhcp server cisco
```

Fill in the blank below

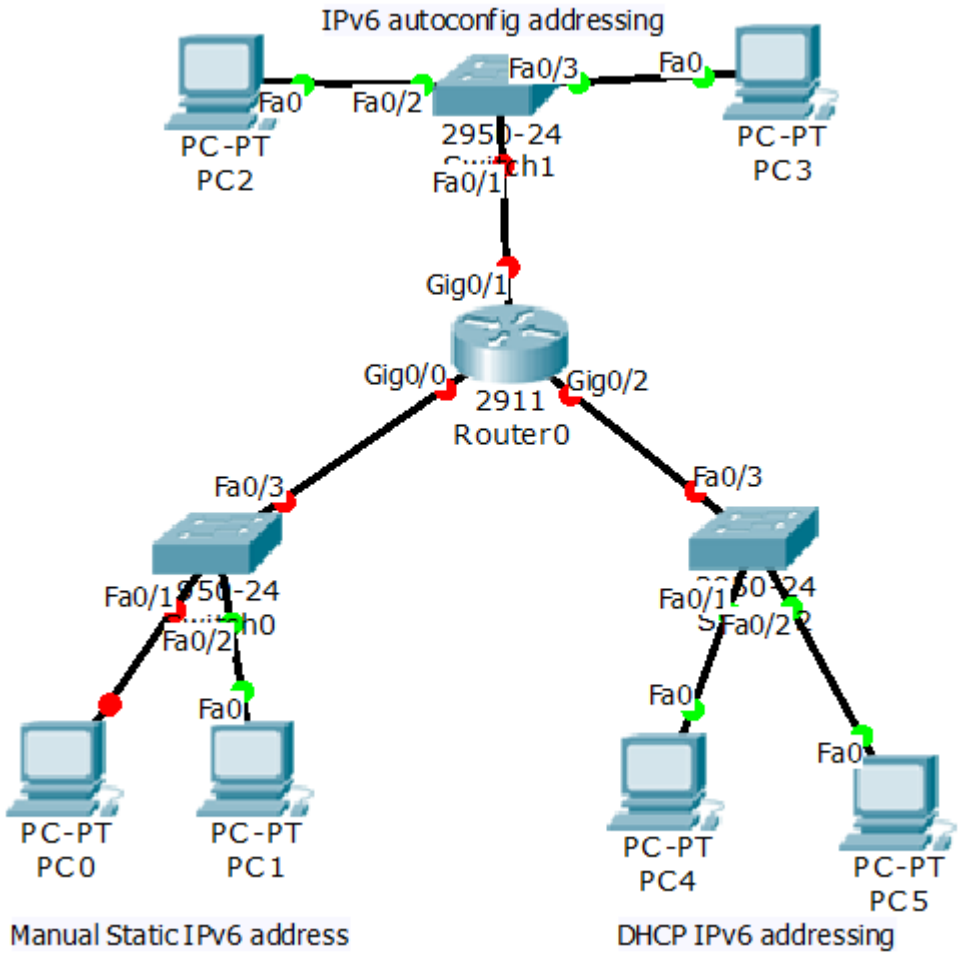
PC0 IPv6 address	2001:: 2E0:F7FF:FE36:C7DA
PC0 Link Local Address	FE80::2E0:F7FF:FE36:C7DA
PC0 IPv6 Default Gateway	FE80::210:11FF:FE17:C701
PC1 IPv6 address	
PC1 Link Local Address	
PC1 IPv6 Default Gateway	

```
Router#sh ipv6 dhcp binding
Client: 00E0.F736.C7DA (GigabitEthernet0/0)
  DUID: 0003000100E0F736C7DA
  IA PD: IA ID 0, T1 0, T2 0
    Prefix: 2001::1/64
          preferred lifetime 604800, valid lifetime 2592000
          expires at April 24 2015 5:22:5 pm (2592000 seconds)
Client: 0001.C737.A596 (GigabitEthernet0/0)
  DUID: 000300010001C737A596
  IA PD: IA ID 0, T1 0, T2 0
    Prefix: 2001::1/64
          preferred lifetime 604800, valid lifetime 2592000
          expires at April 24 2015 5:22:5 pm (2592000 seconds)
Router#
```

https://www.youtube.com/watch?v=ClbQAg7CPsE

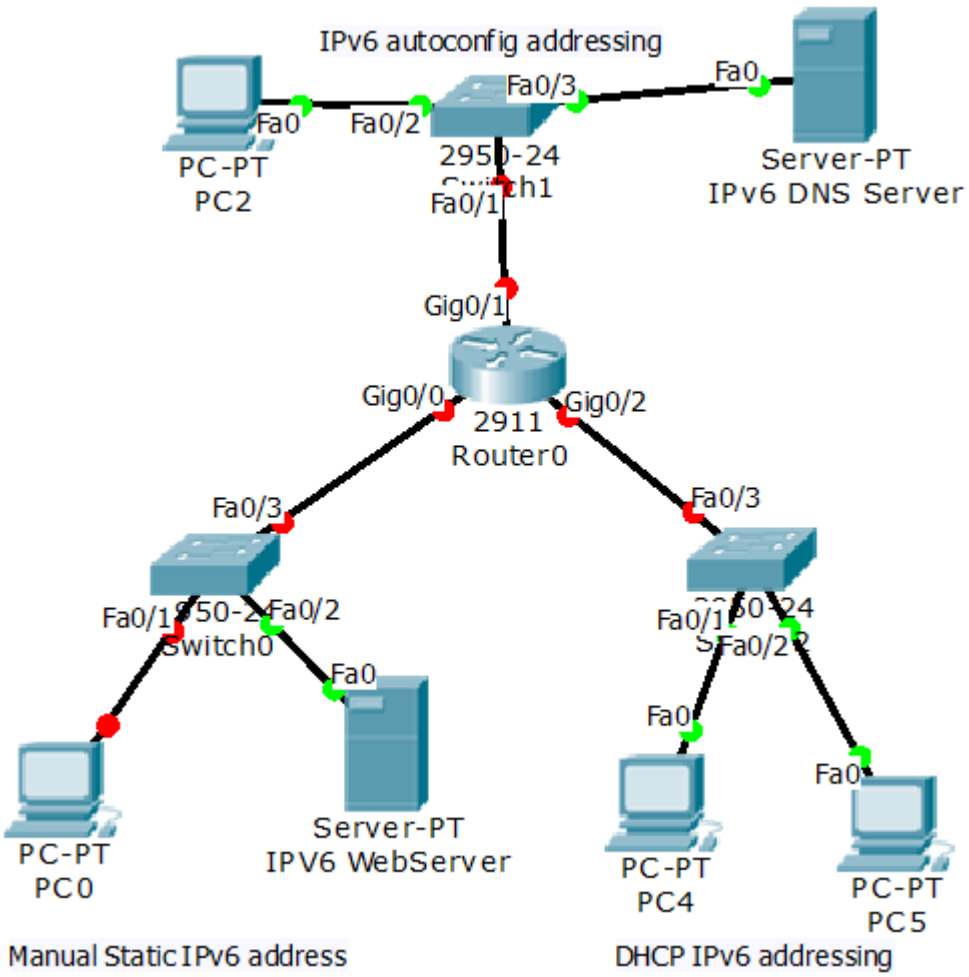
How many ways to give IPv6 address for your PC?

2.4 IPv6 addressing Challenge LAB.



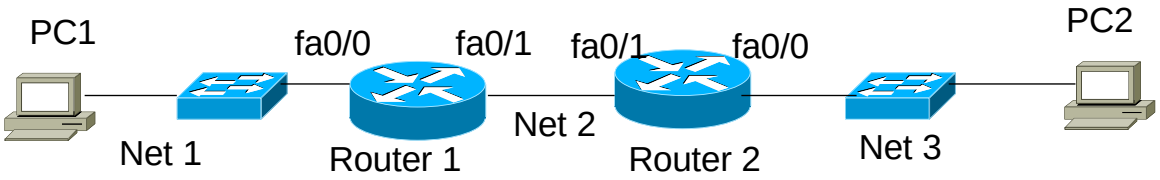
Configure the above network and make sure all PC can IPv6 ping each other. You can use your own IPv6 addressing scheme.

2.5 IPv6 addressing Challenge LAB2



Configure the above network and make sure all PC can access the webserver using the IPv6 domain nameserver. You can use your own IPv6 addressing scheme as long as you follow the restriction above. Note: Tricky question.

3. IPv6 Routing.
   3.1 Static Routing

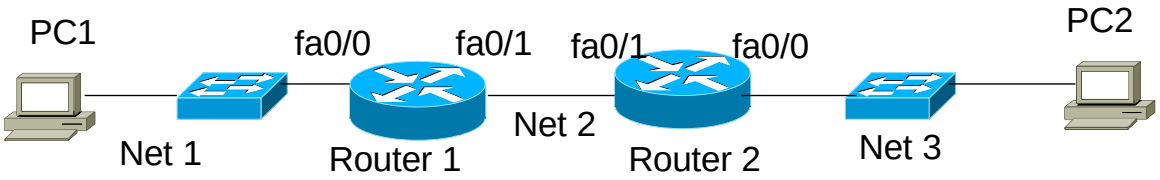


Configure IPv6 for the above network, please use a simple IPv6 address. If you want easy ping then use static IPv6 address for the PC1 so that you don't have to type out all the complicated addresses.

Configure Static Route in Router1 and Router2. IPv6 Ping PC2 from PC1
Write down the essential static route configuration for Router 1 and Router 2.

Router 1 configuration	Router 2 configuration

3. IPv6 Routing.
   3.2 Dynamic Routing



Configure IPv6 for the above network, please use a simple IPv6 address. If you want easy ping then use static IPv6 address for the PC1 so that you don't have to type out all the complicated addresses.
Remove all previous routing configuration
Configure RIP in Router1 and Router2. IPv6 Ping PC2 from PC1
Write down the essential RIP routing configuration for Router 1 and Router 2.

Router 1 IPv6 RIP configuration	Router 2 IPv6 RIP configuration

Remove all previous routing configuration
Configure OSPF in Router1 and Router2. IPv6 Ping PC2 from PC1
Write down the essential OSPF routing configuration for Router 1 and Router 2.

Router 1 IPv6 OSPF configuration	Router 2 IPv6 OSPF configuration

Remove all previous routing configuration
Configure EIGRP in Router1 and Router2. IPv6 Ping PC2 from PC1
Write down the essential EIGRP routing configuration for Router 1 and Router 2.

Router 1 IPv6 EIGRP configuration	Router 2 IPv6 EIGRP configuration

4. The rest of IPv6 configuration can be studied almost the way like IPv4. There are NAT, ACL , Route redistribution.