IPv6_Basic

Right now, many servers are using double stack, both IPv4 and IPv6

Format: XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX(HEX) 128bit 2**128

HEX 0-F 4bit

Unicast:

1.link-local (begin with FE80, one interface must have a link-local),in one single network

2.global: public (AGUA) and private (Site Local, Begin with FEC0) also begin with FC00 and FD00

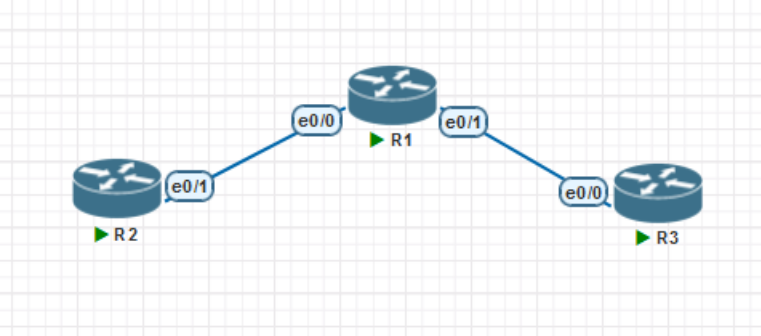
Also one host has many addresses is really common (multi host)

Automatically create the link-local address rely on mechanism called EUI-64 (using MAC addr 48 bits filling to 64 bits)

Multicast

Anycast

Configure



R1

Router>en

Router#conf t

Router(config)#hostname R1

R1(config)#interface ethernet 0/1

R1(config-if)#no shutdown

R1(config-if)#ip address 13.1.1.1 255.255.255.0

R1(config-if)#no shutdown

R1(config-if)#exit

R1(config)#interface ethernet 0/0

R1(config-if)#no shutdown

R1(config-if)#ip address 12.1.1.1 255.255.255.0

R1(config-if)#no shutdown

R1(config-if)#end

R1#show ip interface brief

```
R1#show ip interface brief
Interface                  IP-Address      OK? Method Status                Protocol
Ethernet0/0                12.1.1.1        YES manual up                    up
Ethernet0/1                13.1.1.1        YES manual up                    up
Ethernet0/2                unassigned      YES unset  administratively down down
Ethernet0/3                unassigned      YES unset  administratively down down
```

R1#conf t

R1(config)#router eigrp 90

R1(config-router)#eigrp router-id 1.1.1.1

R1(config-router)#network 12.1.1.1 0.0.0.0

R1(config-router)#network 13.1.1.1 0.0.0.0

R1(config-router)#end

R2

R2(config)#interface ethernet 0/1

R2(config-if)#no shutdown

R2(config-if)#ip address 12.1.1.2 255.255.255.0

R2(config-if)#no shutdown

R2(config-if)#end

R2#show ip interface brief

```
R2#show ip interface brief
Interface                  IP-Address      OK? Method Status                Protocol
Ethernet0/0                unassigned      YES unset  administratively down down
Ethernet0/1                12.1.1.2        YES manual up                    up
Ethernet0/2                unassigned      YES unset  administratively down down
Ethernet0/3                unassigned      YES unset  administratively down down
```

R2#conf t

R2(config)#router eigrp 90

R2(config-router)#eigrp router-id 2.2.2.2

R2(config-router)#network 12.1.1.2 0.0.0.0

R2(config-router)#end

R3

R3(config)#interface ethernet 0/0

R3(config-if)#no shutdown

R3(config-if)#ip address 13.1.1.3 255.255.255.0

R3(config-if)#no shutdown

R3(config-if)#end

R3#show ip interface brief

```
R3#show ip interface brief
Interface                  IP-Address      OK? Method Status                Protocol
Ethernet0/0                13.1.1.3        YES manual up                    up
Ethernet0/1                unassigned      YES unset  administratively down down
Ethernet0/2                unassigned      YES unset  administratively down down
Ethernet0/3                unassigned      YES unset  administratively down down
```

R3(config)#router eigrp 90

R3(config-router)#eigrp router-id 3.3.3.3

R3(config-router)#network 13.1.1.3 0.0.0.0

R3(config-router)#end

IPv6

R1

R1(config)#interface ethernet 0/1

R1(config-if)#ipv6 address 2001:0:0:13::1/64

R1(config-if)#end

R1#show ipv6 interface brief

```
R1#show ipv6 interface brief
Ethernet0/0            [up/up]
    FE80::A8BB:CCFF:FE00:100
    2001:0:0:12::1
Ethernet0/1            [up/up]
    FE80::A8BB:CCFF:FE00:110
    2001:0:0:13::1
Ethernet0/2            [administratively down/down]
    unassigned
Ethernet0/3            [administratively down/down]
    unassigned
```

```
R1#show ipv6 route
IPv6 Routing Table - default - 5 entries
Codes: C - Connected, L - Local, S - Static, U - Per-user Static route
       B - BGP, HA - Home Agent, MR - Mobile Router, R - RIP
       H - NHRP, I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea
       IS - ISIS summary, D - EIGRP, EX - EIGRP external, NM - NEMO
       ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect
       RL - RPL, O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1
       OE2 - OSPF ext 2, ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
       la - LISP alt, lr - LISP site-registrations, ld - LISP dyn-eid
       lA - LISP away, a - Application
C   2001:0:0:12::/64 [0/0]
     via Ethernet0/0, directly connected
L   2001:0:0:12::1/128 [0/0]
     via Ethernet0/0, receive
C   2001:0:0:13::/64 [0/0]
     via Ethernet0/1, directly connected
L   2001:0:0:13::1/128 [0/0]
     via Ethernet0/1, receive
L   FF00::/8 [0/0]
     via Null0, receive
```

R1#show running-config interface ethernet 0/0

```
R1#show running-config interface ethernet 0/0
Building configuration...

Current configuration : 122 bytes
!
interface Ethernet0/0
 ip address 12.1.1.1 255.255.255.0
 duplex auto
 ipv6 address 2001:0:0:12::1/64
 ipv6 enable
end
```

R2

R2(config)#interface ethernet 0/1

R2(config-if)#ipv6 enable

R2(config-if)#ipv6 address 2001:0:0:12::2/64

R2(config-if)#end

R2#show ipv6 interface brief

```
R2#show ipv6 interface brief
Ethernet0/0            [administratively down/down]
    unassigned
Ethernet0/1            [up/up]
    FE80::A8BB:CCFF:FE00:210
    2001:0:0:12::2
Ethernet0/2            [administratively down/down]
    unassigned
Ethernet0/3            [administratively down/down]
    unassigned
```

R3

R3(config)#interface ethernet 0/0

R3(config-if)#ipv6 address 2001:0:0:13::3/64

R3(config-if)#end

R3#show ipv6 route

R3#show ipv6 interface brief