

210F:0000:0000:0000:CCCC:0000:0000:000D

Rule 1: Omit leading zeroes

0001 -leading

1000 -Trailing

Rule 2: Replace continuous occurrences of zeroes with :: (use only once)

210F:0000:0000:0000:CCCC:0000:0000:000D

210F::CCCC:0:0:D

210F:0000:0000:000A:CCCC:0000:0000:000D

210F::A:CCCC:0:0:D

OR

210F:0:0:A:CCCC::D

Prefix-64 bits Interface-ID -64 bits

Unicast

Global unicast Address (GUA)

2000::/3

0010 - 2

0011 - 3

GUA starts 2 or 3 (original)

Link Local Address (LLA) Apipa

FE80::/10

F E 8

1111 1110 10|00 -FE8

1111 1110 10|01 -FE9

1111 1110 10|10 -FEA

1111 1110 10|11 -FEB

::1/128 Loopback ipv4 127.0.0.0/8

::/128 Unspecified

Unique Local Rfc 1918 ipv4

10.0.0.0/8 ,172.16.0.0/12,192.168.0.0/16

FC00::/7

F C
1111 110|0 =FC
1111 110|1 =FD

GUA 2,3
ULA FC,FD
LLA FE8
::1/128 loopback
::/128 Unspecified
MCast FF

IPv6 is enabled, link-local address is FE80::A8BB:CCFF:FE00:100 ---> LLA
No Virtual link-local address(es):
Global unicast address(es):
2001::1, subnet is 2001::/64 --> GUA
Joined group address(es):
FF02::1 ---> All systems ipv6 Mcast address =224.0.0.1
FF02::2 --> All routers ipv6 mcast Add = 224.0.0.2
FF02::1:FF00:1
FF02::1:FF00:100

FE80::A8BB:CCFF:FE00:100
a8bb:ccFF:FE00:0100

aabb.cc00.0100 -48 bit Mac address
aabb.cc 00.0100 ---> Split the mac address into 2 halves (24 bit each)
aabb.cc FFFE 00.0100 ---> 16 bits FFFE is inserted between the 2 halves.
aabb:ccFF:FE00:0100 ---> Flip the 7th bit (if the 7th bit is 0 make it 1 and viceversa)
7
1010 1010
1010 1000

2001::1
00:0001

FF02::1:FF --> 104 BITS ipv6 128 bits

FF02:0000:0000:0000:0000:FF00:0001
FF02::1:FF00:100

DAD
ARP
NDP/ICMPV6
NS
NA

Manual:
conf t
int e0/0

```
ipv6 add 2001::1/64
no sh
exit
```

```
Eui-64
int e0/1
ipv6 add 2002::/64 eui-64
no shut
exit
```

```
Link local
int e0/2
ipv6 add FD11::1234:5678 link-local
no sh
exit
```

SLAAC:

```
R1
conf t
ipv6 unicast-routing
int e0/0
ipv6 add 2001::1/64
no sh
exit
```

SLAAC with option

```
conf t
ipv6 unicast-routing
int e0/0
ipv6 add 2001::1/64
no sh
exit
```

! Dhcpv6 config

```
ipv6 dhcp pool ABC
dns-server 2001::1000
exit
```

```
int e0/0
ipv6 dhcp-server ABC
ipv6 nd other-config-flag
exit
```

Statefull DHCPv6

```
R1:
conf t
ipv6 unicast-routing
int e0/0
```

```
ipv6 add 2001::1/64
no sh
exit
```

```
! Dhcpv6 config
```

```
ipv6 dhcp pool abc
address prefix 2001::/64
dns-server 2001::1000
exit
```

```
int e0/0
ipv6 dhcp server abc
ipv6 nd managed-config-flag
ipv6 nd other-config-flag
ipv6 nd prefix 2001::/64
exit
```

```
Client
conf t
int e0/0
ipv6 enable
ipv6 add dhcp
no sh
exit
```

```
sh ipv6 dhcp int e0/0
```

```
R2
conf t
int e0/0
ipv6 add 2001::2/64
no sh
ip add 10.12.1.2 255.255.255.0
int e0/1
ipv6 add 2222::2222/64
ip add 10.23.1.2 255.255.255.0
no sh
int e0/2
ipv6 add FD22::2222/64
ip add 192.168.2.2 255.255.255.0
no sh
exit
```

```
conf t
int e0/0
ipv6 add 3333::3333/64
no sh
ip add 10.23.1.3 255.255.255.0
int e0/1
```

```
ipv6 add FD33::3333/64
ip add 192.168.3.3 255.255.255.0
no sh
exit
```

OSPFv3

R1

```
ipv6 unicast-routing
```

```
ipv6 router ospf 1
router-id 1.1.1.1
exit
```

```
int range e0/0-1
ipv6 ospf 1 a 0
exit
```

R2

```
ipv6 unicast-routing
```

```
ipv6 router ospf 1
router-id 2.2.2.2
exit
```

```
int range e0/0-2
ipv6 ospf 1 a 0
exit
```

R3

```
ipv6 unicast-routing
```

```
ipv6 router ospf 1
router-id 3.3.3.3
exit
```

```
int range e0/0-1
ipv6 ospf 1 a 0
exit
```

```
do sh ospfv3 nei
```

```
sh ipv6 route
sh ip route
```

```
Router ospfv3
Dual Stack
```

