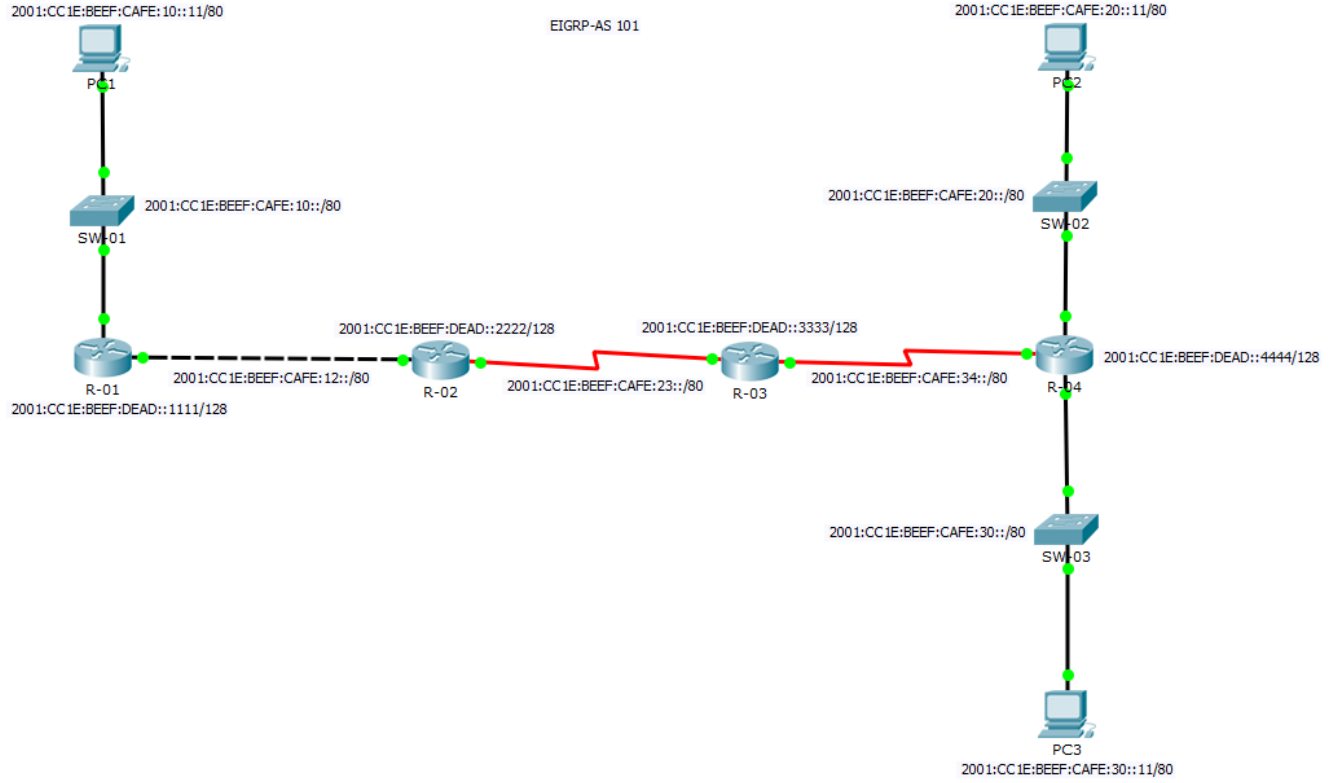


# LAB-222



## Hedef

Router'larda EIGRP Ipv6 konfigurasyonu gerekleřtirerek farklı Ipv6 networklerinin haberleřmesini saęlamak.

PC'lerin IP konfigurasyonları

|     |         |                               |   |
|-----|---------|-------------------------------|---|
| PC1 | VLAN 10 | 2001:CC1E:BEEF:CAFE:10::11/80 | Default GateWay 2001:CC1E:BEEF:CAFE:10::1 |
| PC2 | VLAN 10 | 2001:CC1E:BEEF:CAFE:20::11/80 | Default GateWay 2001:CC1E:BEEF:CAFE:20::1 |
| PC3 | VLAN 10 | 2001:CC1E:BEEF:CAFE:20::11/80 | Default GateWay 2001:CC1E:BEEF:CAFE:30::1 |

## Çalışma-01

Bu çalışmamızda IPv6 taşımacılığı yapmak üzere EIGRP konfigürasyonu gerçekleştireceğiz.

EIGRP IPv6 konfigürasyonu yaparken dikkat edeceğimiz hususlar şunlar olacaktır: Cisco router'lar default ayarlarında IPv6 routing özelliği kapalı gelir. İlk olarak bu özelliği açacak olan **ipv6 unicast-routing** komutunu aktive edeceğiz. IPv6 routing yapılandırmalarında **network** komutu kullanılmamaktadır. Direkt olarak dahil etmek istediğimiz interface'e gidip interface altında gerekli olan komutu girerek, ilgili interface'in EIGRP'ye dahil olmasını sağlayacağız. Stub networkleri **passive-interface** olarak tanımlayarak bu interfacelerden EIGRP *Hello* paketlerinin gitmesini engelleyeceğiz. Bunun hem gereksiz trafiği engellediğini hemde ilgi networklerden yapılabilecek EIGRP ataklarına karşı bir güvenlik tedbiri olduğunu belirtmek isterim. EIGRP IPv6 yapılandırmasında bir diğer önemli husus ise mevcut interface'lerde 32 bitlik bir adres olmadığı için, ihtiyaç duyulan **Router-ID** değerini manuel olarak vermemizin bizden bekleniyor olduğudur.

EIGRP IPv6 konfigürasyonu sayesinde routerlar üzerlerindeki ve öğrendikleri IPv6 networklerin bilgilerini, birbirleriyle paylaşacaklardır. Bu paylaşım neticesinde PC'lerin birbirleri ile IPv6 haberleşmesi de sağlanmış olacaktır.

```
R-01#configure terminal
R-01(config)#ipv6 unicast-routing
R-01(config)#
R-01(config)#ipv6 router eigrp 101
R-01(config-rtr)#eigrp router-id 1.1.1.1
R-01(config-rtr)#no shutdown
R-01(config-rtr)#passive-interface GigabitEthernet 0/0
R-01(config-rtr)#exit
R-01(config)#interface loopback 0
R-01(config-if)#ipv6 eigrp 101
R-01(config-if)#
R-01(config-if)#interface GigabitEthernet0/1
R-01(config-if)#ipv6 eigrp 101
R-01(config-if)#
R-01(config-if)#interface GigabitEthernet0/0
R-01(config-if)#ipv6 eigrp 101
R-01(config-if)#end
R-02#configure terminal
R-02(config)#ipv6 unicast-routing
R-02(config)#
R-02(config)#ipv6 router eigrp 101
R-02(config-rtr)#eigrp router-id 2.2.2.2
R-02(config-rtr)#no shutdown
R-02(config-rtr)#exit
R-02(config)#
R-02(config)#interface loopback 0
R-02(config-if)#ipv6 eigrp 101
R-02(config-if)#
R-02(config-if)#interface GigabitEthernet0/1
R-02(config-if)#ipv6 eigrp 101
```

```
R-02(config-if)#  
R-02(config-if)#interface Serial10/0/0  
R-02(config-if)#ipv6 eigrp 101  
R-02(config-if)#end  
R-02#
```

```
R-03#configure terminal  
R-03(config)#ipv6 unicast-routing  
R-03(config)#  
R-03(config)#ipv6 router eigrp 101  
R-03(config-rtr)#eigrp router-id 3.3.3.3  
R-03(config-rtr)#no shutdown  
R-03(config-rtr)#exit  
R-03(config)#  
R-03(config)#interface loopback 0  
R-03(config-if)#ipv6 eigrp 101  
R-03(config-if)#  
R-03(config-if)#interface Serial10/0/0  
R-03(config-if)#ipv6 eigrp 101  
R-03(config-if)#  
R-03(config-if)#interface Serial10/0/1  
R-03(config-if)#ipv6 eigrp 101  
R-03(config-if)#end  
R-03#
```

```
R-04#configure terminal  
R-04(config)#ipv6 unicast-routing  
R-04(config)#  
R-04(config)#ipv6 router eigrp 101  
R-04(config-rtr)#eigrp router-id 4.4.4.4  
R-04(config-rtr)#no shutdown  
R-04(config-rtr)#exit  
R-04(config)#  
R-04(config)#interface loopback 0  
R-04(config-if)#ipv6 eigrp 101  
R-04(config-if)#  
R-04(config-if)#interface GigabitEthernet 0/0  
R-04(config-if)#ipv6 eigrp 101  
R-04(config-if)#  
R-04(config-if)#interface GigabitEthernet 0/1  
R-04(config-if)#ipv6 eigrp 101  
R-04(config-if)#  
R-04(config-if)#interface Serial10/0/0  
R-04(config-if)#ipv6 eigrp 101  
R-04(config-if)#end  
R-04#
```

Router R-02'de IPV6 Routing tablosuna bakalım.

```
R-02#sh ipv6 route
IPv6 Routing Table - 13 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route, M - MIPv6
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
       D - EIGRP, EX - EIGRP external
D  2001:CC1E:BEEF:CAFE:10::/80 [90/3072]
   via FE80::2E0:A3FF:FE46:7B02, GigabitEthernet0/1
C  2001:CC1E:BEEF:CAFE:12::/80 [0/0]
   via GigabitEthernet0/1, directly connected
L  2001:CC1E:BEEF:CAFE:12::2/128 [0/0]
   via GigabitEthernet0/1, receive
D  2001:CC1E:BEEF:CAFE:20::/80 [90/2682112]
   via FE80::210:11FF:FE0E:9D01, Serial0/0/0
C  2001:CC1E:BEEF:CAFE:23::/80 [0/0]
   via Serial0/0/0, directly connected
L  2001:CC1E:BEEF:CAFE:23::2/128 [0/0]
   via Serial0/0/0, receive
D  2001:CC1E:BEEF:CAFE:30::/80 [90/2682112]
   via FE80::210:11FF:FE0E:9D01, Serial0/0/0
D  2001:CC1E:BEEF:CAFE:34::/80 [90/2681856]
   via FE80::210:11FF:FE0E:9D01, Serial0/0/0
D  2001:CC1E:BEEF:DEAD::1111/128 [90/130816]
   via FE80::2E0:A3FF:FE46:7B02, GigabitEthernet0/1
C  2001:CC1E:BEEF:DEAD::2222/128 [0/0]
   via Loopback0, directly connected
D  2001:CC1E:BEEF:DEAD::3333/128 [90/2297856]
   via FE80::210:11FF:FE0E:9D01, Serial0/0/0
D  2001:CC1E:BEEF:DEAD::4444/128 [90/2809856]
   via FE80::210:11FF:FE0E:9D01, Serial0/0/0
L  FF00::/8 [0/0]
   via Null0, receive
R-02#
R-02#
```

Bu tablo bize bütün loopback IP'lerinin, bütün router'lar arasındaki bağlantı IP'lerinin ve en arkadaki PC networklerinin başarılı bir şekilde routerlar arasında taşındığını göstermektedir. Tabloya göre R-02 2001:CC1E:BEEF:DEAD::4444/128 networküne 2809856 metric uzaklıktaymiş.

R-02#**show ipv6 eigrp interfaces**

IPv6-EIGRP interfaces for process 101

|           |       | Xmit Queue  | Mean | Pacing Time | Multicast  |        |
|-----------|-------|-------------|------|-------------|------------|--------|
| Pending   |       |             |      |             |            |        |
| Interface | Peers | Un/Reliable | SRTT | Un/Reliable | Flow Timer | Routes |
| Lo0       | 0     | 0/0         | 1236 | 0/10        | 0          | 0      |
| Gig0/1    | 1     | 0/0         | 1236 | 0/10        | 0          | 0      |
| Se0/0/0   | 1     | 0/0         | 1236 | 0/10        | 0          | 0      |

R-02#

R-02#**show ipv6 eigrp neighbors**

IPv6-EIGRP neighbors for process 101

| H | Address   | Interface | Hold (sec) | Uptime   | SRTT (ms) | RTO  | Q Cnt | Seq Num |
|---|---|-----------|------------|----------|-----------|------|-------|---------|
| 0 | Link-local address:<br>FE80::2E0:A3FF:FE46:7B02 | Gig0/1    | 12         | 00:11:03 | 40        | 1000 | 0     | 15      |
| 1 | Link-local address:<br>FE80::210:11FF:FE0E:9D01 | Se0/0/0   | 14         | 00:08:33 | 40        | 1000 | 0     | 15      |

R-02#

R-02#**show ipv6 eigrp topology**

IPv6-EIGRP Topology Table for AS 101/ID(2.2.2.2)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,  
r - Reply status

```

P 2001:CC1E:BEEF:CAFE:10::/80, 1 successors, FD is 3072
    via FE80::2E0:A3FF:FE46:7B02 (3072/2816), GigabitEthernet0/1
P 2001:CC1E:BEEF:CAFE:12::/80, 1 successors, FD is 2816
    via Connected, GigabitEthernet0/1
P 2001:CC1E:BEEF:CAFE:20::/80, 1 successors, FD is 2682112
    via FE80::210:11FF:FE0E:9D01 (2682112/2170112), Serial0/0/0
P 2001:CC1E:BEEF:CAFE:23::/80, 1 successors, FD is 2169856
    via Connected, Serial0/0/0
P 2001:CC1E:BEEF:CAFE:30::/80, 1 successors, FD is 2682112
    via FE80::210:11FF:FE0E:9D01 (2682112/2170112), Serial0/0/0
P 2001:CC1E:BEEF:CAFE:34::/80, 1 successors, FD is 2681856
    via FE80::210:11FF:FE0E:9D01 (2681856/2169856), Serial0/0/0
P 2001:CC1E:BEEF:DEAD::1111/128, 1 successors, FD is 130816
    via FE80::2E0:A3FF:FE46:7B02 (130816/128256), GigabitEthernet0/1
P 2001:CC1E:BEEF:DEAD::2222/128, 1 successors, FD is 128256
    via Connected, Loopback0
P 2001:CC1E:BEEF:DEAD::3333/128, 1 successors, FD is 2297856
    via FE80::210:11FF:FE0E:9D01 (2297856/128256), Serial0/0/0
P 2001:CC1E:BEEF:DEAD::4444/128, 1 successors, FD is 2809856
    via FE80::210:11FF:FE0E:9D01 (2809856/2297856), Serial0/0/0

```

R-02#

R-02#**show ipv6 eigrp topology all-links**

IPv6-EIGRP Topology Table for AS 101/ID(2.2.2.2)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,  
r - Reply status

```
P 2001:CC1E:BEEF:CAFE:10::/80, 1 successors, FD is 3072
    via FE80::2E0:A3FF:FE46:7B02 (3072/2816), GigabitEthernet0/1
P 2001:CC1E:BEEF:CAFE:12::/80, 1 successors, FD is 2816
    via Connected, GigabitEthernet0/1
P 2001:CC1E:BEEF:CAFE:20::/80, 1 successors, FD is 2682112
    via FE80::210:11FF:FE0E:9D01 (2682112/2170112), Serial0/0/0
P 2001:CC1E:BEEF:CAFE:23::/80, 1 successors, FD is 2169856
    via Connected, Serial0/0/0
P 2001:CC1E:BEEF:CAFE:30::/80, 1 successors, FD is 2682112
    via FE80::210:11FF:FE0E:9D01 (2682112/2170112), Serial0/0/0
P 2001:CC1E:BEEF:CAFE:34::/80, 1 successors, FD is 2681856
    via FE80::210:11FF:FE0E:9D01 (2681856/2169856), Serial0/0/0
P 2001:CC1E:BEEF:DEAD::1111/128, 1 successors, FD is 130816
    via FE80::2E0:A3FF:FE46:7B02 (130816/128256), GigabitEthernet0/1
P 2001:CC1E:BEEF:DEAD::2222/128, 1 successors, FD is 128256
    via Connected, Loopback0
P 2001:CC1E:BEEF:DEAD::3333/128, 1 successors, FD is 2297856
    via FE80::210:11FF:FE0E:9D01 (2297856/128256), Serial0/0/0
P 2001:CC1E:BEEF:DEAD::4444/128, 1 successors, FD is 2809856
    via FE80::210:11FF:FE0E:9D01 (2809856/2297856), Serial0/0/0
```

R-02#

Bu yapıda yedekli bir yol olmadığı için üstteki tablo ile bir önceki arasında bir fark göremiyoruz.

R-02#**show ipv6 protocols**

IPv6 Routing Protocol is "connected"

IPv6 Routing Protocol is "ND"

IPv6 Routing Protocol is "eigrp 101"

**EIGRP metric weight K1=1, K2=0, K3=1, K4=0, K5=0**

EIGRP maximum hopcount 100

EIGRP maximum metric variance 1

Interfaces:

**Loopback0**

**GigabitEthernet0/1**

**Serial0/0/0**

Redistributing: eigrp 101

Maximum path: 16

Distance: internal 90 external 170

R-02#

```
R-01#show ipv6 protocols
IPv6 Routing Protocol is "connected"
IPv6 Routing Protocol is "ND"
IPv6 Routing Protocol is "eigrp 101"
  EIGRP metric weight K1=1, K2=0, K3=1, K4=0, K5=0
  EIGRP maximum hopcount 100
  EIGRP maximum metric variance 1
Interfaces:
  Loopback0
  GigabitEthernet0/1
  GigabitEthernet0/0 (passive)
Redistributing: eigrp 101
  Maximum path: 16
  Distance: internal 90 external 170

R-01#
```

Bu arada PC'lerin haberleşmelerine bir bakalım. PC1'den diğerlerine ping atalım.

```
PC>ping 2001:CC1E:BEEF:CAFE:20::11
```

```
Pinging 2001:CC1E:BEEF:CAFE:20::11 with 32 bytes of data:
```

```
Reply from 2001:CC1E:BEEF:CAFE:20::11: bytes=32 time=2ms TTL=124
Reply from 2001:CC1E:BEEF:CAFE:20::11: bytes=32 time=2ms TTL=124
Reply from 2001:CC1E:BEEF:CAFE:20::11: bytes=32 time=2ms TTL=124
Reply from 2001:CC1E:BEEF:CAFE:20::11: bytes=32 time=13ms TTL=124
```

```
Ping statistics for 2001:CC1E:BEEF:CAFE:20::11:
```

```
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 13ms, Average = 4ms
```

```
PC>
```

```
PC>ping 2001:CC1E:BEEF:CAFE:30::11
```

```
Pinging 2001:CC1E:BEEF:CAFE:30::11 with 32 bytes of data:
```

```
Reply from 2001:CC1E:BEEF:CAFE:30::11: bytes=32 time=2ms TTL=124
Reply from 2001:CC1E:BEEF:CAFE:30::11: bytes=32 time=12ms TTL=124
Reply from 2001:CC1E:BEEF:CAFE:30::11: bytes=32 time=2ms TTL=124
Reply from 2001:CC1E:BEEF:CAFE:30::11: bytes=32 time=2ms TTL=124
```

```
Ping statistics for 2001:CC1E:BEEF:CAFE:30::11:
```

```
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 12ms, Average = 4ms
```

```
PC>
```



## Router'ların son config'leri

```
R-01#show running-config
Building configuration...

Current configuration : 1124 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R-01
!
no ip cef
ipv6 unicast-routing
!
no ipv6 cef
!
license udi pid CISCO2901/K9 sn FTX1524ALVY
!
no ip domain-lookup
!
spanning-tree mode pvst
!
interface Loopback0
  no ip address
  ipv6 address 2001:CC1E:BEEF:DEAD::1111/128
  ipv6 eigrp 101
!
interface GigabitEthernet0/0
  no ip address
  duplex auto
  speed auto
  ipv6 address 2001:CC1E:BEEF:CAFE:10::1/80
  ipv6 eigrp 101
!
interface GigabitEthernet0/1
  no ip address
  duplex auto
  speed auto
  ipv6 address 2001:CC1E:BEEF:CAFE:12::1/80
  ipv6 eigrp 101
!
```

```
!  
interface Serial0/0/0  
  no ip address  
  clock rate 2000000  
  shutdown  
!  
interface Serial0/0/1  
  no ip address  
  clock rate 2000000  
  shutdown  
!  
interface Vlan1  
  no ip address  
  shutdown  
!  
ipv6 router eigrp 101  
  eigrp router-id 1.1.1.1  
  no shutdown  
  passive-interface GigabitEthernet0/0  
!  
ip classless  
!  
ip flow-export version 9  
!  
line con 0  
  exec-timeout 0 0  
  logging synchronous  
!  
line aux 0  
!  
line vty 0 4  
  login  
!  
end
```

```
R-02#show running-config
Building configuration...

Current configuration : 1086 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R-02
!
no ip cef
ipv6 unicast-routing
!
no ipv6 cef
!
license udi pid CISCO2901/K9 sn FTX15240R13
!
no ip domain-lookup
!
spanning-tree mode pvst
!
interface Loopback0
  no ip address
  ipv6 address 2001:CC1E:BEEF:DEAD::2222/128
  ipv6 eigrp 101
!
interface GigabitEthernet0/0
  no ip address
  duplex auto
  speed auto
  shutdown
!
interface GigabitEthernet0/1
  no ip address
  duplex auto
  speed auto
  ipv6 address 2001:CC1E:BEEF:CAFE:12::2/80
  ipv6 eigrp 101
!
interface Serial0/0/0
  no ip address
  ipv6 address 2001:CC1E:BEEF:CAFE:23::2/80
  ipv6 eigrp 101
  clock rate 2000000
!
```

```
!  
interface Serial0/0/1  
  no ip address  
  clock rate 2000000  
  shutdown  
!  
interface Vlan1  
  no ip address  
  shutdown  
!  
ipv6 router eigrp 101  
  eigrp router-id 2.2.2.2  
  no shutdown  
!  
ip classless  
!  
ip flow-export version 9  
!  
line con 0  
  exec-timeout 0 0  
  logging synchronous  
!  
line aux 0  
!  
line vty 0 4  
  login  
!  
end
```

```
R-03#show running-config
Building configuration...

Current configuration : 1066 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R-03
!
no ip cef
ipv6 unicast-routing
!
no ipv6 cef
!
license udi pid CISCO2901/K9 sn FTX1524073W
!
no ip domain-lookup
!
spanning-tree mode pvst
!
interface Loopback0
  no ip address
  ipv6 address 2001:CC1E:BEEF:DEAD::3333/128
  ipv6 eigrp 101
!
interface GigabitEthernet0/0
  no ip address
  duplex auto
  speed auto
  shutdown
!
interface GigabitEthernet0/1
  no ip address
  duplex auto
  speed auto
  shutdown
!
interface Serial0/0/0
  no ip address
  ipv6 address 2001:CC1E:BEEF:CAFE:23::3/80
  ipv6 eigrp 101
!
```

```
!  
interface Serial0/0/1  
  no ip address  
  ipv6 address 2001:CC1E:BEEF:CAFE:34::3/80  
  ipv6 eigrp 101  
  clock rate 2000000  
!  
interface Vlan1  
  no ip address  
  shutdown  
!  
ipv6 router eigrp 101  
  eigrp router-id 3.3.3.3  
  no shutdown  
!  
ip classless  
!  
ip flow-export version 9  
!  
line con 0  
  exec-timeout 0 0  
  logging synchronous  
!  
line aux 0  
!  
line vty 0 4  
  login  
!  
end
```

```
R-04#show running-config
```

```
Building configuration...
```

```
Current configuration : 1112 bytes
```

```
!  
version 15.1  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname R-04  
!  
ip cef  
ipv6 unicast-routing  
!  
no ipv6 cef  
!  
license udi pid CISCO2901/K9 sn FTX1524UDPU  
!  
no ip domain-lookup  
!  
spanning-tree mode pvst  
!  
interface Loopback0  
  no ip address  
  ipv6 address 2001:CC1E:BEEF:DEAD::4444/128  
  ipv6 eigrp 101  
!  
interface GigabitEthernet0/0  
  no ip address  
  duplex auto  
  speed auto  
  ipv6 address 2001:CC1E:BEEF:CAFE:20::1/80  
  ipv6 eigrp 101  
!  
interface GigabitEthernet0/1  
  no ip address  
  duplex auto  
  speed auto  
  ipv6 address 2001:CC1E:BEEF:CAFE:30::1/80  
  ipv6 eigrp 101  
!  
interface Serial0/0/0  
  no ip address  
  ipv6 address 2001:CC1E:BEEF:CAFE:34::4/80  
  ipv6 eigrp 101  
!
```

```
!  
interface Serial0/0/1  
  no ip address  
  clock rate 2000000  
  shutdown  
!  
interface Vlan1  
  no ip address  
  shutdown  
!  
ipv6 router eigrp 101  
  eigrp router-id 4.4.4.4  
  no shutdown  
!  
ip classless  
!  
ip flow-export version 9  
!  
line con 0  
  exec-timeout 0 0  
  logging synchronous  
!  
line aux 0  
!  
line vty 0 4  
  login  
!  
end
```

<https://goo.gl/Lvidal>



Umarım faydalı bir LAB çalışması olmuştur.  
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