

## **EIGRP Unable to Establish Neighbourhood (ASN Mismatch)**

**OSI Layer** Layer 3 - Network Layer

### **Problem Definition**

Dynamic routing protocols facilitate network management and improve network performance by automatically updating network routing tables in large and complex network infrastructures. Among these protocols, Enhanced Interior Gateway Routing Protocol (EIGRP) is a hybrid routing protocol developed by Cisco that combines both distance vector and state-based protocol features. For EIGRP to work properly, routers must be configured under the same Autonomous System Number (ASN). Otherwise, even if the routers can receive "Hello" packets from each other, they cannot establish a neighbourhood relationship, which prevents the sharing of routing information.

### **Detection Steps**

-Checking the Physical Connection: Verify that the connection between both routers is physically established and that the FastEthernet0/1 interfaces are in the "up/up" state.

The following command is used for this operation:

```
show ip interface brief
```

-Checking the Correctness of the IP Configuration: It is examined whether the IP addresses assigned to the interfaces of both routers are correct.

For example:

Router 0 → 10.0.0.0.1

Router 1 → 10.0.0.0.2

With the ping command, it is tested that the routers can reach each other:

```
ping 10.0.0.0.2
```

-Comparison of EIGRP Processes: The following command displays the EIGRP process (ASN) active on each router:

```
show ip protocols
```

By comparing the outputs obtained, it is checked whether both routers are operating under the same ASN (Autonomous System Number).

-Questioning the Neighbourhood Status:

EIGRP neighbourhood information is queried with the following command:

```
show ip eigrp neighbours
```

### **Admin Guide Steps:**

**Step 1:** Examination of Protocol Information and EIGRP Processes: Active EIGRP configurations are displayed on both routers:

```
R1# show ip protocols
```

```
R2# show ip protocols
```

ASN numbers, routed networks and passive interfaces, if any, are checked here.

**Step 2:** ASN Mapping: Routers must operate under the same ASN (Autonomous System Number). Otherwise, neighbourhood cannot be established.

Example of correct configuration:

```
Router(config)# router eigrp 100
```

```
Router(config-router)# network 10.0.0.0.0
```

```
Router(config-router)# network 192.168.0.0
```

```
Router(config-router)# no auto-summary
```

**Step 3:** Deletion of Misconfiguration (If any)

Previous EIGRP processes defined under a different ASN are removed:

```
Router(config)# no router eigrp 200
```

#### **Step 4:** Activating the Correct EIGRP Process

EIGRP is redefined with the appropriate ASN and the relevant networks are configured:

```
Router(config)# router eigrp 100
```

```
Router(config-router)# network 10.0.0.0
```

```
Router(config-router)# network 192.168.0.0
```

#### **Step 5:** Verification of Neighbourhood

Neighbourhood status:

```
Router# show ip eigrp neighbours
```

It is checked that EIGRP routes are added to the routing table:

```
Router# show ip route
```

**Step 6:** Continuous Ping Test (Connection Health Monitoring): Continuity of the connection to the neighbour router is tested

```
Router# ping 10.0.0.0.X repeat 100
```

#### **Simulation**

The aim of this simulation is to demonstrate the ASN (Autonomous System Number) mismatch between two routers that causes the failure to establish EIGRP neighbourhood and to identify and resolve the problem.

Correct EIGR connection

Router0:

FastEthernet0/0: 192.168.0.1/24

FastEthernet0/1: 10.0.0.0.1/24

EIGRP ASN: 100

Router1:

FastEthernet0/0: 192.168.0.2/24

FastEthernet0/1: 10.0.0.0.2/24

EIGRP ASN: 100

Faulty EIGRP connection

Router0:

FastEthernet0/0: 192.168.0.1/24

FastEthernet0/1: 10.0.0.0.1/24

EIGRP ASN: 100

Router1:

FastEthernet0/0: 192.168.0.2/24

FastEthernet0/1: 10.0.0.0.2/24

EIGRP ASN: 200 (erroneous ASN)

The screenshot shows a Cisco Packet Tracer console window for Router0. The window has tabs for Physical, Config, CLI, and Attributes, with CLI selected. The title bar says "Router0". The console output shows the following sequence of commands and responses:

```
Would you like to enter the initial configuration dialog? [yes/no]:
Press RETURN to get started!

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 192.168.0.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#ip address 10.0.0.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

Router(config-if)#exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Router(config)#router eigrp 100
Router(config-router)#network 192.168.0.0
Router(config-router)#network 10.0.0.0
Router(config-router)#no auto-summary
Router(config-router)#exit
Router(config)#
%DUAL-5-NBRCHANGE: IP-EIGRP 100: Neighbor 10.0.0.2 (FastEthernet0/1) is up: new adjacency

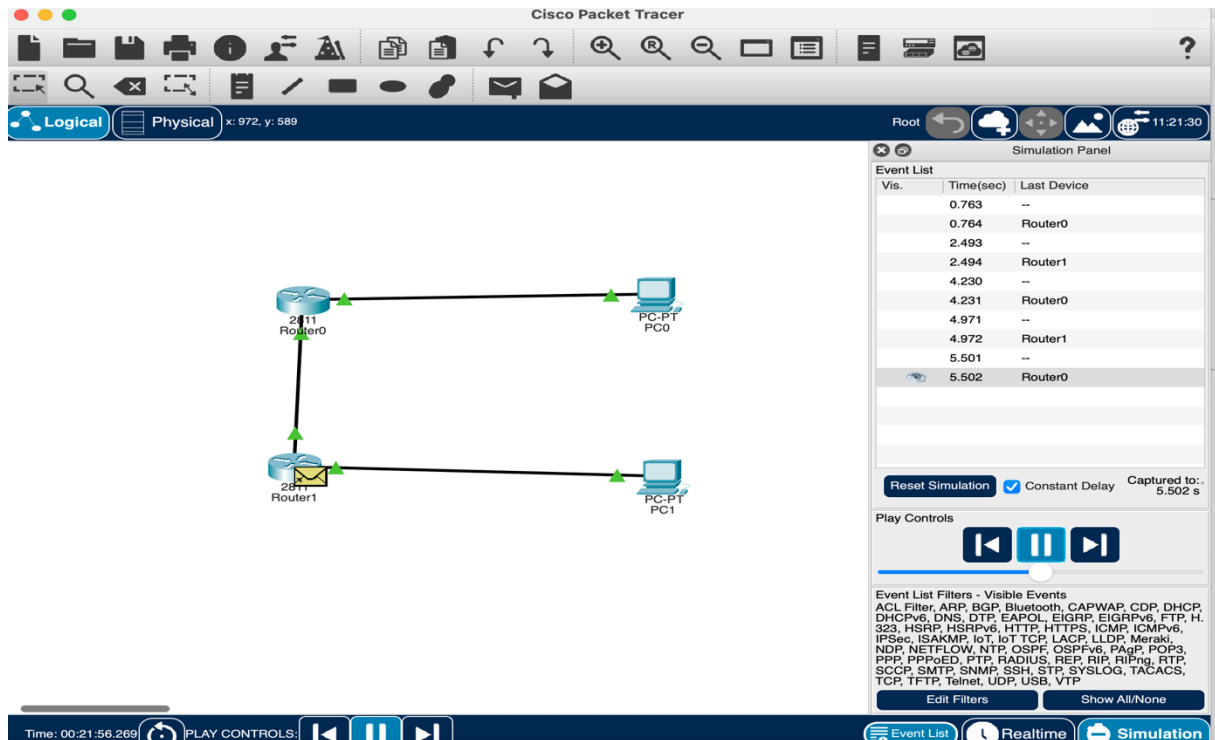
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip eigrp neighbors
IP-EIGRP neighbors for process 100
H  Address          Interface      Hold Uptime   SRTT  RTO  Q  Seq
(sec)              (ms)
0  10.0.0.2          Fa0/1         10  00:02:56   40    1000  0  1

Router#
```

At the bottom right of the console window, there are "Copy" and "Paste" buttons. At the bottom left, there is a "Top" button.

In the first case, the neighbourhood is established.



EIGRP Hello packets are sent between Router 0 and Router 1.

Router0

Physical Config CLI Attributes

IOS Command Line Interface

```

Router(config)#router eigrp 100
Router(config-router)#network 192.168.0.0
Router(config-router)#network 10.0.0.0
Router(config-router)#no auto-summary
Router(config-router)#exit
Router(config)#
%DUAL-5-NBRCHANGE: IP-EIGRP 100: Neighbor 10.0.0.2 (FastEthernet0/1) is up: new adjacency

Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip eigrp neighbors
IP-EIGRP neighbors for process 100
H  Address          Interface    Hold Uptime   SRTT  RTO  Q  Seq
 (sec)              (ms)                  Cnt  Num
0   10.0.0.2          Fa0/1        10   00:02:56   40    1000  0   1

Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router eigrp 100
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#sho
%DUAL-5-NBRCHANGE: IP-EIGRP 100: Neighbor 10.0.0.2 (FastEthernet0/1) is down: holding time expir
Router#show ip eigrp neighbors
IP-EIGRP neighbors for process 100

Router#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    10.0.0.0/24 is directly connected, FastEthernet0/1
L    10.0.0.1/32 is directly connected, FastEthernet0/1
C    192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.0.0/24 is directly connected, FastEthernet0/0
L    192.168.0.1/32 is directly connected, FastEthernet0/0

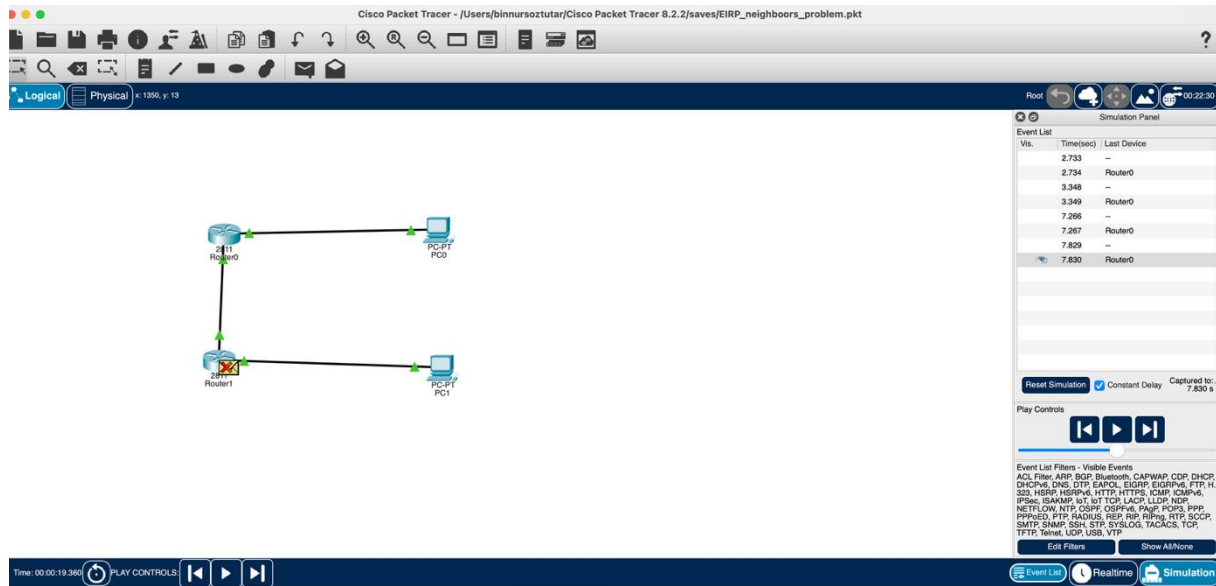
Router#

```

Copy Paste

Top

When the neighbourhood is removed and the eigrp values are made different, the neighbourhood cannot be established and ASN mismatch occurs.



Packages cannot be sent.

In case of using different ASNs, even if the physical connection and IP configurations are correct, the routers cannot establish neighbourhood.

**Simulation File Name:**

**P8\_210316084\_BinnurSöztutar\_EIGRP\_neighboors\_problem(ASN\_Mismatch).pkt**