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 neighbourborship 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 (AS number) 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 10.0.0.0.0

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

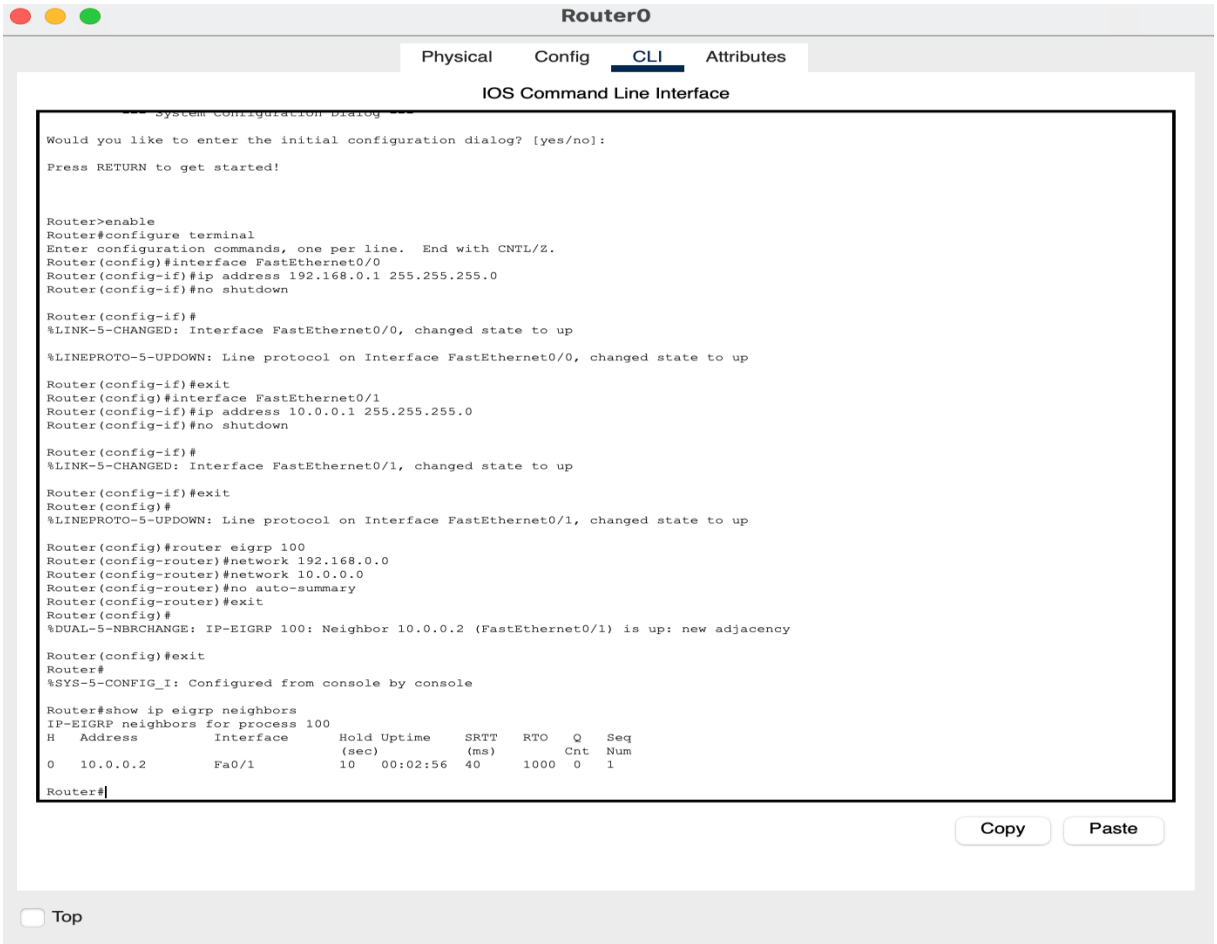
EIGRP ASN: 100

Router1:

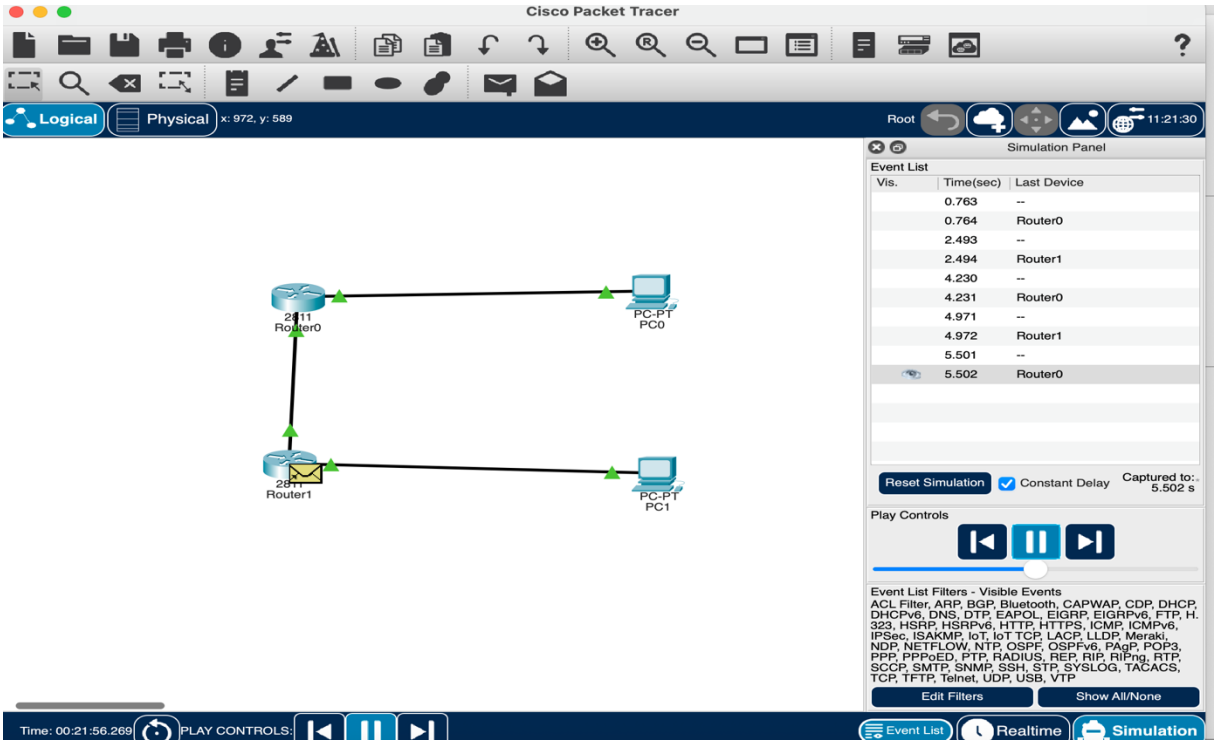
FastEthernet0/0: 192.168.0.2/24

FastEthernet0/1: 10.0.0.0.2/24

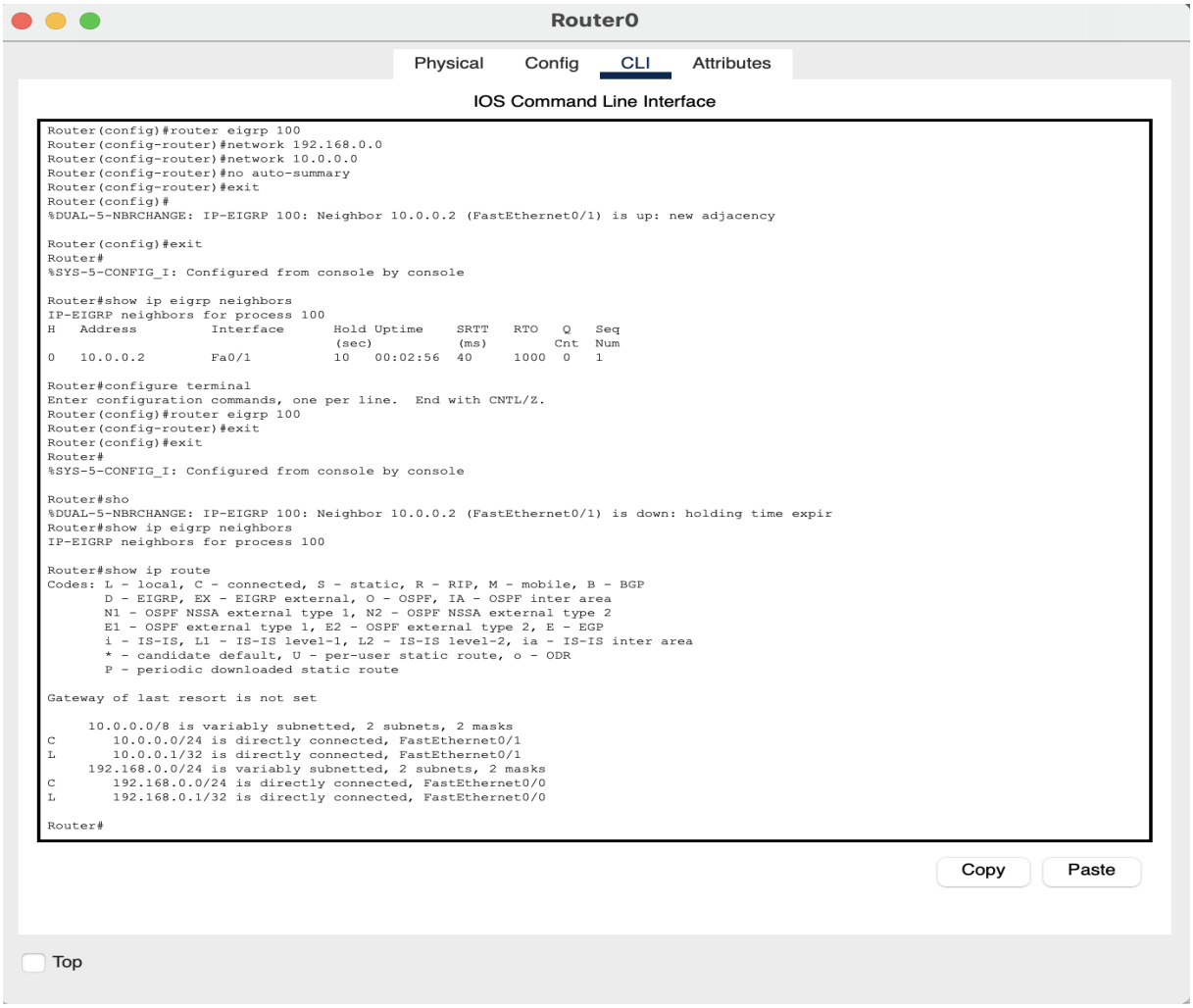
EIGRP ASN: 200 (erroneous ASN)



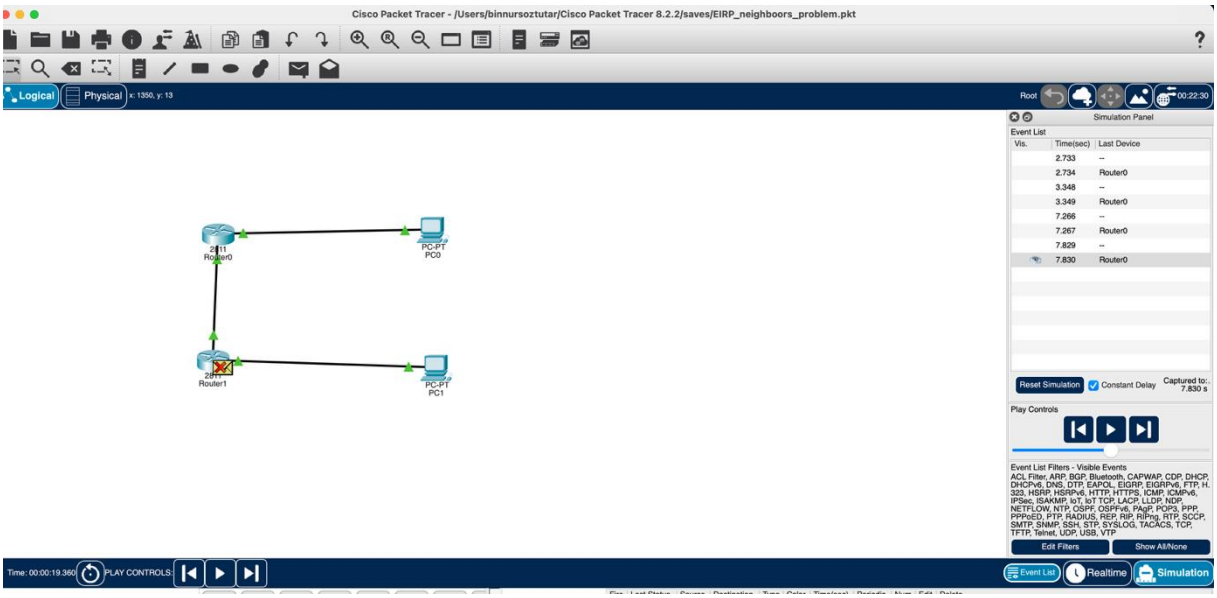
In the first case, the neighbourhood is established.



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



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