

ADVANCED NETWORKING III

CASE STUDY PART - 2

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ISSUE 1:

The actual issue and what the problematic network device is.

- SVI vlan 110 has an incorrect ip address configured
- The problematic device is DLS2

Troubleshooting approach used to find the issue.

- Follow the path

Steps that were taken to find the issue (must follow selected troubleshooting approach).

- Tried to request an ip address from the DHCP server for the connected host
- Show ip dhcp pool command is used to verify pool of IP addresses
- Show ip int brief command is used to make sure that the VLAN on which the host is connected is configured with the correct address
- We found out that vlan 110 had an incorrect IP 10.110.1.15 configured on DLS2. The device must have an interface with an IP address that is a part of a pool. This ensures that the clients are in the same subnet as the DHCP server. In this case, the correct address should be 10.1.110.5/24

Commands entered to correct the issue.

DLS2:

```
interface vlan110
no ip address 10.110.1.5 255.255.255.0
ip address 10.1.110.5 255.255.255.0
no shut
exit
```

Verification that the issue has been resolved.

- Issue a “show interface vlan 110” on DLS2 to verify that the correct IP address is configured

ISSUE 2:

The actual issue and what the problematic network device is.

- DLS2 and R4 could not form RIP neighbor adjacency
- The problematic device is R4

Troubleshooting approach used to find the issue.

- Divide and Conquer

Steps that were taken to find the issue (must follow selected troubleshooting approach).

- Pings were sent from R4 to R3 to see if DLS2 sends a packet to R3 but it failed

- We then checked the routing table using the show ip route and did not find any route to R3
- show ip int brief was used to check if the ip address is configured on the interface of R4 and on DLS2
- Interface E0/1 was shut down on R4 which stopped it to form neighbor adjacency with DLS2

Commands entered to correct the issue.

R4:

```
interface e0/1
no shutdown
exit
```

Verification that the issue has been resolved.

- Issue a “show interfaces e0/1 description” to verify if status and protocol of e0/1 are up.

ISSUE 3:

The actual issue and what the problematic network device is.

- R3 cannot form a neighbor adjacency with R4
- The problematic device is R3

Troubleshooting approach used to find the issue.

- Follow the path

Steps that were taken to find the issue (must follow selected troubleshooting approach).

- Ping failed from R3 to R4.
- We double checked the ip address configured by doing a show ip interface brief on R3 and we see that E0/1 on R3 has an incorrect ip address configured.

Commands entered to correct the issue.

R3:

```
interface e0/1
no ip address 10.16.8.1 255.255.255.252
ip address 10.15.8.1 255.255.255.252
```

Verification that the issue has been resolved.

- Issue a “show interface e0/1” on R3 to verify that an accurate IP address is configured

ISSUE 4:

The actual issue and what the problematic network device is.

- An inside port on DLS1 is acting as an outside (global) port. It should be considered as an inside port because it is part of the private network.

- The Problematic device is DLS1

Troubleshooting approach used to find the issue.

-

Steps that were taken to find the issue (must follow selected troubleshooting approach).

-

Commands entered to correct the issue.

On DLS1:

```
interface e0/1
no ip nat outside
ip nat inside
```

Verification that the issue has been resolved.

- Issue a “show ip nat statistics” on DLS1 to verify whether the interfaces are placed inside or outside

ISSUE 5:

The actual issue and what the problematic network device is.

- R1 is not able to form EIGRP neighbor adjacency with DLS1
- The Problematic device is R1

Troubleshooting approach used to find the issue.

- Divide and Conquer

Steps that were taken to find the issue (must follow selected troubleshooting approach).

- Pings from R1 and R2 failed and neighbors did not appear in the neighbor table
- Pings did not work between R1 and R2. It would have worked if there were an EIGRP neighbor adjacency
- Routers do not have any neighbors at this point
- Since pings failed and the neighbor table did not contain any neighbors. So the first verification we took was to check for correct authentication and we found the error:
 - R1 had an incorrect keychain configuration. In DLS1 Keychain is eigrpAuth whereas in R1 it was keychain eigrpauth which means that both routers created a different keychain since keychains are case sensitive.

```
R1#show eigrp address-family ipv4 interfaces detail e0/0 | include Auth
Authentication mode is HMAC-SHA-256, key-chain is "eigrpauth"
```

```
DLS1#show eigrp address-family ipv4 interfaces detail e0/1 | include Auth
Authentication mode is HMAC-SHA-256, key-chain is "eigrpAuth"
```

Commands entered to correct the issue.

To fix the issue on R1:

- First, remove the incorrect key chain, remove it from inside the interface, which is running EIGRP protocol, and authenticate packets using new keychains

R1:

```
no key chain eigrpauth
key chain eigrpAuth
key 1
key-string cisco123
```

```
router eigrp CASESTUDY
address-family ipv4 unicast autonomous-system 1
af-interface Ethernet0/0
no authentication key-chain eigrpauth
authentication key-chain eigrpAuth
exit af-interface
exit-address-family
exit
router eigrp CASESTUDY
address-family ipv6 unicast autonomous-system 1
af-interface Ethernet0/0
no authentication key-chain eigrpauth
authentication key-chain eigrpAuth
exit af-interface
exit-address-family
exit
```

ISSUE 6:

The actual issue and what the problematic network device is.

- Adjacency between DLS1 and R2 are not forming.
- The Problematic device is R2

Troubleshooting approach used to find the issue.

- Follow the path

Steps that were taken to find the issue (must follow selected troubleshooting approach).

- Ping from R1 to R2 failed.
- Show ip route on R2 only showed it's a connected route
- Eigrp neighbor table on R2 is empty
- After seeing the neighbor table being empty we issued a show ip protocols command on R2 where it showed that interface e0/0 was passive. This stopped all hello packets from being answered by R2

Commands entered to correct the issue.

```

R2:
router eigrp CASESTUDY
address-family ipv4 unicast autonomous-system 1
af-interface Ethernet0/0
no passive-interface
exit-af-interface
exit-address-family
address-family ipv6 unicast autonomous-system 1
af-interface Ethernet0/0
no passive-interface
exit-af-interface
exit-address-family

```

Verification that the issue has been resolved.

- On R2, issue a “show ip protocol” to verify if there is still a passive interface configured on R2 and also a “show ip eigrp neighbor” to see if R2 is forming a neighbor with DLS1.
- Lastly, a ping to DLS1’s 10.15.5.2 address can verify that there is indeed a neighbor adjacency between the two.

ISSUE 7:

The actual issue and what the problematic network device is.

- R5 and DLS1 not able to form a TCP connection
- The problematic device is R5

Troubleshooting approach used to find the issue.

- Divide and Conquer

Steps that were taken to find the issue (must follow selected troubleshooting approach).

- Ping from DLS1 to R5’s loopback failed as well as pings from DLS1 to R5’s interface failed
- Show ip route is used on both DLS1 and R5 to check for routes of DLS1 and R5’s interface which were not visible
- Since no route appeared in the routing table and pings failed which indicates an issue in the peer relationship
- To check if the connection was established we used show ip bgp summary. We found out that R5 is in the active state and DLS1 is in the idle state
- Active and idle state indicates that both devices are not exchanging routes since they cannot make a TCP connection with one another
- We use debug ip tcp intercept to check why these two routers are not forming TCP connection
- This command showed that R5 is using loopback as its source address which leads to TCP connection failure

```
R5#show log | begin update
*Dec 5 13:06:26.073: BGP: 10.15.0.2 passive open failed - 10.15.0.1 is not update-source Loopback1's address (203.15.0.1)
*Dec 5 13:06:26.073: BGP: 10.15.0.2 remote connection attempt failed(due to session creation failure, local address 10.15.0.1)
*Dec 5 13:06:26.073: TCP: sending RST, seq 3370037681, ack 0
*Dec 5 13:06:26.073: TCP0: state was ESTAB -> CLOSED [179 -> 10.15.0.2(4103)]
```

Commands entered to correct the issue.

R5:

```
router bgp 15
no neighbor 10.15.0.2 update-source loopback 0
neighbor 10.15.0.2 remote-as 15
exit
```

Verification that the issue has been resolved.

- On R5 issue a “show ip bgp summary” to see the state it is in.
- R5 issue a “show ip bgp” to see if the next hop is the neighbors IP address.
- Lastly, ping DLS1’s IP address (10.15.0.2) to verify connectivity