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1. Verification of the issue

→

```
R3#ping 2.2.2.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
R3#traceroute 2.2.2.2 source 10.1.80.0
% Invalid source address- IP address not on any of our up interfaces
R3#show ip int bri
Any interface listed with OK? value "NO" does not have a valid configuration

Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0/0   unassigned      YES unset  administratively down down
GigabitEthernet0/0/1   10.1.2.14       YES TFTP   up                    up
GigabitEthernet0/0/2   unassigned      YES unset  down                  down
Serial0/1/0            unassigned      NO  unset  up                    down
Serial0/1/1            unassigned      NO  unset  up                    down
GigabitEthernet0       unassigned      YES TFTP   administratively down down
Loopback0              10.1.203.1      YES TFTP   up                    up
Loopback1              10.1.80.129     YES TFTP   up                    up
Loopback2              10.1.80.1       YES TFTP   up                    up
R3#traceroute 2.2.2.2 source 10.1.80.1
Type escape sequence to abort.
Tracing the route to 2.2.2.2
VRF info: (vrf in name/id, vrf out name/id)
  1  *  *  *
  2  *  *  *
  3  *  *  *
  4  *  *  *
  5  *  *  *
  6  *  *  *
  7  *  *  *
  8  *  *  *
```

2. Troubleshooting method used

Follow the path: Starting from Judith's host on the 10.1.80.0/25 subnet, we tested connectivity hop-by-hop towards the internet target 2.2.2.2, verifying each default gateway and routing decision along the path. Ping failed so it's probably an L2 or vlan issue.

Divide and Conquer: after confirming that the end-to-end connectivity to 2.2.2.2 was failing, we can use divide and conquer approach. Instead of checking every hop we start from a midpoint in the path (R3's Lo2 interface) to test reachability towards both the internet and the users' subnet.

3. Steps taken to find the issue(s)

1. **R3 no default routes**

→ R3 has no default routes (0.0.0.0/0)

```
R3#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, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

      10.0.0.0/8 is variably subnetted, 14 subnets, 4 masks
C        10.1.2.12/30 is directly connected, GigabitEthernet0/0/1
L        10.1.2.14/32 is directly connected, GigabitEthernet0/0/1
O IA     10.1.30.0/24 [110/2] via 10.1.2.13, 00:21:46, GigabitEthernet0/0/1
C        10.1.80.0/25 is directly connected, Loopback2
L        10.1.80.1/32 is directly connected, Loopback2
C        10.1.80.128/25 is directly connected, Loopback1
L        10.1.80.129/32 is directly connected, Loopback1
O IA     10.1.99.0/24 [110/2] via 10.1.2.13, 00:21:46, GigabitEthernet0/0/1
O IA     10.1.100.0/24 [110/2] via 10.1.2.13, 00:21:46, GigabitEthernet0/0/1
O IA     10.1.110.0/24 [110/2] via 10.1.2.13, 00:21:46, GigabitEthernet0/0/1
O IA     10.1.120.0/24 [110/2] via 10.1.2.13, 00:21:46, GigabitEthernet0/0/1
O IA     10.1.200.0/24 [110/2] via 10.1.2.13, 00:21:46, GigabitEthernet0/0/1
C        10.1.203.1/32 is directly connected, Loopback0
O        10.1.212.1/32 [110/2] via 10.1.2.13, 00:21:46, GigabitEthernet0/0/1
R3#
```

```
R3#show ip protocols
*** IP Routing is NSF aware ***

Routing Protocol is "application"
  Sending updates every 0 seconds
  Invalid after 0 seconds, hold down 0, flushed after 0
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Maximum path: 32
  Routing for Networks:
  Routing Information Sources:
    Gateway         Distance      Last Update
  Distance: (default is 4)

Routing Protocol is "eigrp 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Default networks flagged in outgoing updates
  Default networks accepted from incoming updates
  EIGRP-IPv4 VR(HQ) Address-Family Protocol for AS(1)
    Metric weight K1=1, K2=0, K3=1, K4=0, K5=0 K6=0
    Metric rib-scale 128
    Metric version 64bit
    Soft SIA disabled
    NSF-aware route hold timer is 240
  EIGRP NSF disabled
     NSF signal timer is 20s
     NSF converge timer is 120s
    Router-ID: 10.1.203.1
    Topology : 0 (base)
      Active Timer: 3 min
      Distance: internal 90 external 170
      Maximum path: 4
      Maximum hopcount 100
      Maximum metric variance 1
      Total Prefix Count: 0
      Total Redist Count: 0

  Automatic Summarization: disabled
  Maximum path: 4
  Routing for Networks:
    10.1.81.0/24
  Routing Information Sources:
    Gateway         Distance      Last Update
  Distance: internal 90 external 170

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 3.0.0.3
  It is an autonomous system boundary router
 Redistributing External Routes from,
    eigrp with metric mapped to 100, includes subnets in redistribution
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    10.1.2.12 0.0.0.3 area 0
    10.1.203.1 0.0.0.0 area 0
  Passive Interface(s):
    GigabitEthernet0/0/0
    GigabitEthernet0/0/2
    Serial0/1/0
    Serial0/1/1
    Loopback0
    Loopback1
    Loopback2
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1              110      00:24:00
  Distance: (default is 110)

R3#
```

2. **Duplicate router-id**

→ both DLS1 and DLS2 have a duplicate route-id which is evident as OSPF gives us a error message

→ the correct router-id for DLS2 should be 2.2.2.2

```
DLS2#
Nov 21 16:22:25: %OSPF-4-DUP_RTRID_NBR: OSPF detected duplicate router-id 1.1.1.1 from 10.1.30.252 on interface V
lan300
DLS2#
Nov 21 16:23:30: %OSPF-4-DUP_RTRID_NBR: OSPF detected duplicate router-id 1.1.1.1 from 10.1.30.252 on interface V
lan300
```

```
DLS1#
Nov 21 16:21:51.459: %OSPF-4-DUP_RTRID_NBR: OSPF detected duplicate router-id 1.1.1.1 from 10.1.30.253 on interfa
ce Vlan300
DLS1#
Nov 21 16:22:58.239: %OSPF-4-DUP_RTRID_NBR: OSPF detected duplicate router-id 1.1.1.1 from 10.1.30.253 on interfa
ce Vlan300
DLS1#
```

3. Incorrect area in vlan 300

→ correct area should be area 0 instead of area 1

```
DLS1#show ip ospf rib

            OSPF Router with ID (1.1.1.1) (Process ID 1)


                Base Topology (MTID 0)

OSPF local RIB
Codes: * - Best, > - Installed in global RIB

*   10.1.2.0/30, Intra, cost 1, area 0, Connected
      via 10.1.2.1, GigabitEthernet1/0/11
*   10.1.30.0/24, Intra, cost 1, area 1, Connected
      via 10.1.30.252, Vlan300
*   10.1.99.0/24, Intra, cost 1, area 1, Connected
      via 10.1.99.252, Vlan99
*   10.1.100.0/24, Intra, cost 1, area 1, Connected
      via 10.1.100.252, Vlan100
*   10.1.110.0/24, Intra, cost 1, area 1, Connected
      via 10.1.110.252, Vlan110
*   10.1.120.0/24, Intra, cost 1, area 1, Connected
      via 10.1.120.252, Vlan120
*   10.1.200.0/24, Intra, cost 1, area 1, Connected
      via 10.1.200.252, Vlan200
*   10.1.211.1/32, Intra, cost 1, area 0, Connected
      via 10.1.211.1, Loopback0
*>  192.168.1.1/32, Intra, cost 2, area 0
      via 10.1.2.2, GigabitEthernet1/0/11
DLS1#
```

```
DLS2#show ip ospf rib

            OSPF Router with ID (1.1.1.1) (Process ID 1)


                Base Topology (MTID 0)

OSPF local RIB
Codes: * - Best, > - Installed in global RIB

*   10.1.2.12/30, Intra, cost 1, area 0, Connected
      via 10.1.2.13, GigabitEthernet1/0/11
*   10.1.30.0/24, Intra, cost 1, area 1, Connected
      via 10.1.30.253, Vlan300
*   10.1.99.0/24, Intra, cost 1, area 1, Connected
      via 10.1.99.253, Vlan99
*   10.1.100.0/24, Intra, cost 1, area 1, Connected
      via 10.1.100.253, Vlan100
*   10.1.110.0/24, Intra, cost 1, area 1, Connected
      via 10.1.110.253, Vlan110
*   10.1.120.0/24, Intra, cost 1, area 1, Connected
      via 10.1.120.253, Vlan120
*   10.1.200.0/24, Intra, cost 1, area 1, Connected
      via 10.1.200.253, Vlan200
*>  10.1.203.1/32, Intra, cost 2, area 0
      via 10.1.2.14, GigabitEthernet1/0/11
*   10.1.212.1/32, Intra, cost 1, area 0, Connected
      via 10.1.212.1, Loopback0
DLS2#
```

4. **Trunks**

```
DLS1#show interfaces trunk

Port        Mode             Encapsulation  Status        Native vlan
Po1         on               802.1q         trunking      666
Po10        on               802.1q         trunking      666

Port        Vlans allowed on trunk
Po1         99,110,120,200
Po10        99-100,110,120,200,300

Port        Vlans allowed and active in management domain
Po1         99,110,120,200
Po10        99-100,110,120,200,300

Port        Vlans in spanning tree forwarding state and not pruned
Po1         99,110,120,200
Po10        99-100,110,120,200,300
DLS1#
```

5. **Wrong IP address assigned on R3 Lo2**

```
R3#show ip int br
Any interface listed with OK? value "NO" does not have a valid configuration

Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0/0   unassigned      YES unset  administratively down down
GigabitEthernet0/0/1   10.1.2.14       YES TFTP   up                    up
GigabitEthernet0/0/2   unassigned      YES unset  down                  down
Serial0/1/0            unassigned      NO  unset  up                    down
Serial0/1/1            unassigned      NO  unset  up                    down
GigabitEthernet0       unassigned      YES TFTP   administratively down down
Loopback0              10.1.203.1      YES TFTP   up                    up
Loopback1              10.1.80.129     YES TFTP   up                    up
Loopback2              10.1.80.1       YES TFTP   up                    up
R3#
```

6. **BGP Peer**

```
R1#show ip bgp
BGP table version is 2, local router ID is 11.0.0.11
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
              x best-external, a additional-path, c RIB-compressed,
              t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

     Network          Next Hop            Metric LocPrf Weight Path
 *>   0.0.0.0          192.168.2.1              0             0 65502 i
R1#
```

```
R2#show ip bgp
BGP table version is 2, local router ID is 22.0.0.22
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
              x best-external, a additional-path, c RIB-compressed,
              t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

     Network          Next Hop            Metric LocPrf Weight Path
 *>   0.0.0.0          0.0.0.0                  0         32768 i
```

4. Description of the issue

1. R3 no default routes:
    - R1 was not advertising a default route into OSPF, and the distribution switches had misconfigured OSPF area which prevented proper route distribution. Without a default route, R3 could not forward traffic towards external destinations like 2.2.2.2. Any devices in the 10.1.80.0/25 subnet that used R3 as their gateway also lost internet connectivity.
2. Duplicate router id
    - Each router must have its own router ID
    - With the same router ID OSPF will think that they are the same router and this might cause a loop or a deadend breaking connectivity
3. Incorrect area in VLAN 300
    - An incorrect OSPF area in VLAN 300 can prevent the link between R1 and the distribution layer to exchange routes
4. Trunks
    - According to the topology given the correct vlans that are allowed in?????
5. Wrong IP address assigned on R3 Lo2
    - With a wrong IP address of Lo2 you will be pining/tracerouting the wrong address
    - Advertisements for EIGRP and OSPF will cause more problems with connectivity since it won't be sending traffic to the correct places

5. Commands entered to fix the issue

1. R3 no default routes

Commands entered on R1:
→ ip route 0.0.0.0 0.0.0.0 2.2.2.2
→ router ospf 1
→ default-information originate

```
R1(config)#ip route 0.0.0.0 0.0.0.0 2.2.2.2
R1(config)#
Nov 21 17:40:25.721: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:ip route 0.0.0.0 0.0.0.0 2.2.2.2
R1(config)#router ospf 1
R1(config-router)#de
Nov 21 17:40:35.747: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:router ospf 1
R1(config-router)#default-information originate
```

2. **Duplicate router-id**

Commands entered on DLS2:
→router ospf 1
→router-id 2.2.2.2
→ clear ip ospf process

```
lan300
DLS2(config)#router ospf 1
DLS2(config-router)#
Nov 21 17:05:45: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:router ospf 1
DLS2(config-router)#router-id 2.2.2.2
% OSPF: Reload or use "clear ip ospf process" command, for this to take effect
```

3. **Incorrect area in vlan 300**

Commands entered on DLS2:
→ router ospf 1
→ no network 10.1.30.0 0.0.0.255 area 1
→ network 10.1.30.0 0.0.0.255 area 0
→ no shut

```
DLS2(config)#router ospf 1
DLS2(config-router)#
Nov 21 17:15:50: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:router ospf 1
DLS2(config-router)#no network 10.1.30.0 0.0.0.255 area 1
DLS2(config-router)#net
Nov 21 17:17:04: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:no network 10.1.30.0 0.0.0.255 area 1
Nov 21 17:17:04: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on vlan300 from FULL to DOWN, Neighbor Down: Interface do
wn or detached
DLS2(config-router)#network 10.1.30.0 0.0.0.255 area 0
DLS2(config-router)#
Nov 21 17:17:30: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:network 10.1.30.0 0.0.0.255 area 0
DLS2(config-router)#no shutdown
DLS2(config-router)#exit
Nov 21 17:17:34: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:no shutdown
DLS2(config-router)#exit
```

Commands entered on DLS1:
→ router ospf 1
→ no network 10.1.30.0 0.0.0.255 area 1
→ network 10.1.30.0 0.0.0.255 area 0
→ no shut

```
DLS1(config)#router ospf 1
DLS1(config-router)#no ne
Nov 21 17:18:30.909: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:router ospf 1
DLS1(config-router)#no network
Nov 21 17:18:32.322: %OSPF-4-ERRRCV: Received invalid packet: mismatched area ID from backbone area from 10.1.30.
253, Vlan300
DLS1(config-router)#no network 10.1.
Nov 21 17:18:41.422: %OSPF-4-ERRRCV: Received invalid packet: mismatched area ID from backbone area from 10.1.30.
253, Vlan300
DLS1(config-router)#no network 10.1.30.0 0.0.0.255 area 1
Nov 21 17:18:50.993: %OSPF-4-ERRRCV: Received invalid packet: mismatched area ID from backbone area from 10.1.30.
253, Vlan300
DLS1(config-router)#no network 10.1.30.0 0.0.0.255 area 1
DLS1(config-router)#ne
Nov 21 17:18:57.093: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:no network 10.1.30.0 0.0.0.255 area
 1
DLS1(config-router)#network 10.1.30.0 0.0.0.255 area 0
DLS1(config-router)#n
Nov 21 17:19:13.502: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:network 10.1.30.0 0.0.0.255 area 0
Nov 21 17:19:13.507: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Vlan300 from LOADING to FULL, Loading Done
DLS1(config-router)#no shutdown
DLS1(config-router)#ex
Nov 21 17:19:16.478: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:no shutdown
DLS1(config-router)#exit
DLS1(config)#
Nov 21 17:19:18.109: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:exit
DLS1(config)#
```

4. **Wrong allowed trunks**

Commands entered on DLS1:
→

5. **Wrong IP address assigned on R3 Lo2**

Commands entered on R3:
→ int lo2
→ no ip address 10.1.80.1 255.255.255.128
→ ip address 10.1.80.0 255.255.255.255

6. **BGP Peer**

Commands entered on R1:
→ router bgp 65501
→ network 192.168.1.1 mask 255.255.255.0

Commands entered on R1:
→ ip route 0.0.0.0 0.0.0.0 209.165.200.226
→ router ospf 1
→ default-information originate

```
R1(config)#ip route 0.0.0.0 0.0.0.0 209.165.200.226
R1(config)#
Nov 21 18:09:22.472: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:ip route 0.0.0.0 0.0.0.0 209.165.
200.226
R1(config)#router ospf 1
R1(config-router)#
Nov 21 18:09:29.961: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:router ospf 1
R1(config-router)#default-information originate
R1(config-router)#end
Nov 21 18:09:41.496: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:default-information originate
R1(config-router)#end
```

```
R3(config)#int lo2
R3(config-if)#
Nov 21 17:21:21.461: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:interface Loopback2
R3(config-if)#no ip address 10.1.80.1 255.255.255.255
Invalid address
R3(config-if)#
Nov 21 17:21:44.094: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:no ip address 10.1.80.1 255.255.255
.255
R3(config-if)#
R3(config-if)#
R3(config-if)#do show ip int bri
Any interface listed with OK? value "NO" does not have a valid configuration

Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0/0   unassigned      YES unset  administratively down down
GigabitEthernet0/0/1   10.1.2.14       YES TFTP   up                    up
GigabitEthernet0/0/2   unassigned      YES unset  down                  down
Serial0/1/0            unassigned      NO  unset  up                    down
Serial0/1/1            unassigned      NO  unset  up                    down
GigabitEthernet0       unassigned      YES TFTP   administratively down down
Loopback0              10.1.203.1      YES TFTP   up                    up
Loopback1              10.1.80.129     YES TFTP   up                    up
Loopback2              10.1.80.1       YES TFTP   up                    up
R3(config-if)#no ip address 10.1.80.1 255.255.255.128
R3(config-if)#
Nov 21 17:23:07.793: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:no ip address 10.1.80.1 255.255.255
.128
R3(config-if)#ip address 10.1.80.0 255.255.255.128
Bad mask /25 for address 10.1.80.0
R3(config-if)#
Nov 21 17:23:46.830: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:ip address 10.1.80.0 255.255.255.12
8
R3(config-if)#no ip address 10.1.80.0 255.255.255.128
Bad mask /25 for address 10.1.80.0
R3(config-if)#
Nov 21 17:24:01.581: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:no ip address 10.1.80.0 255.255.255
.128
R3(config-if)#ip address 10.1.80.0 255.255.255.255
R3(config-if)#end
Nov 21 17:24:13.375: %PARSER-5-CFGLOG_LOGGEDCMD: User:console  logged command:ip address 10.1.80.0 255.255.255.25
5
R3(config-if)#no shut
R3(config-if)#end
```

6. Verification the issue is resolved

1. R3 no default route

```
R1#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, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is 192.168.2.1 to network 0.0.0.0

B*    0.0.0.0/0 [20/0] via 192.168.2.1, 01:40:15
      10.0.0.0/8 is variably subnetted, 12 subnets, 3 masks
C        10.1.2.0/30 is directly connected, GigabitEthernet0/0/1
L        10.1.2.2/32 is directly connected, GigabitEthernet0/0/1
O        10.1.2.12/30 [110/3] via 10.1.2.1, 00:20:53, GigabitEthernet0/0/1
O        10.1.30.0/24 [110/2] via 10.1.2.1, 00:20:57, GigabitEthernet0/0/1
O IA     10.1.99.0/24 [110/2] via 10.1.2.1, 01:39:24, GigabitEthernet0/0/1
O IA     10.1.100.0/24 [110/2] via 10.1.2.1, 01:39:24, GigabitEthernet0/0/1
O IA     10.1.110.0/24 [110/2] via 10.1.2.1, 01:39:24, GigabitEthernet0/0/1
O IA     10.1.120.0/24 [110/2] via 10.1.2.1, 01:39:24, GigabitEthernet0/0/1
O IA     10.1.200.0/24 [110/2] via 10.1.2.1, 01:39:24, GigabitEthernet0/0/1
O        10.1.203.1/32 [110/4] via 10.1.2.1, 00:20:53, GigabitEthernet0/0/1
O        10.1.211.1/32 [110/2] via 10.1.2.1, 01:39:24, GigabitEthernet0/0/1
O        10.1.212.1/32 [110/3] via 10.1.2.1, 00:20:53, GigabitEthernet0/0/1
      192.168.1.0/32 is subnetted, 1 subnets
C        192.168.1.1 is directly connected, Loopback0
      192.168.2.0/32 is subnetted, 1 subnets
S        192.168.2.1 [1/0] via 209.165.200.226
      209.165.200.0/24 is variably subnetted, 2 subnets, 2 masks
C        209.165.200.224/30 is directly connected, GigabitEthernet0/0/0
L        209.165.200.225/32 is directly connected, GigabitEthernet0/0/0
R1#
```

2. **Duplicate router-id**

```
DLS2#
Nov 21 17:12:55: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Vlan300 from LOADING to FULL, Loading Done
DLS2#show run | sec ospf
 ip ospf network point-to-point
router ospf 1
 router-id 2.2.2.2
 passive-interface default
 no passive-interface Vlan300
 no passive-interface GigabitEthernet1/0/11
 network 10.1.2.12 0.0.0.3 area 0
 network 10.1.30.0 0.0.0.255 area 1
 network 10.1.99.0 0.0.0.255 area 1
 network 10.1.100.0 0.0.0.255 area 1
 network 10.1.110.0 0.0.0.255 area 1
 network 10.1.120.0 0.0.0.255 area 1
 network 10.1.200.0 0.0.0.255 area 1
 network 10.1.212.1 0.0.0.0 area 0
DLS2#
```

3. **Incorrect area in vlan 300**

```
DLS1(config)#do show ip ospf rib

            OSPF Router with ID (1.1.1.1) (Process ID 1)


                Base Topology (MTID 0)

OSPF local RIB
Codes: * - Best, > - Installed in global RIB

*   10.1.2.0/30, Intra, cost 1, area 0, Connected
      via 10.1.2.1, GigabitEthernet1/0/11
*>  10.1.2.12/30, Intra, cost 2, area 0
      via 10.1.30.253, Vlan300
*   10.1.30.0/24, Intra, cost 1, area 0, Connected
      via 10.1.30.252, Vlan300
*   10.1.99.0/24, Intra, cost 1, area 1, Connected
      via 10.1.99.252, Vlan99
*   10.1.100.0/24, Intra, cost 1, area 1, Connected
      via 10.1.100.252, Vlan100
*   10.1.110.0/24, Intra, cost 1, area 1, Connected
      via 10.1.110.252, Vlan110
*   10.1.120.0/24, Intra, cost 1, area 1, Connected
      via 10.1.120.252, Vlan120
*   10.1.200.0/24, Intra, cost 1, area 1, Connected
      via 10.1.200.252, Vlan200
*>  10.1.203.1/32, Intra, cost 3, area 0
      via 10.1.30.253, Vlan300
*   10.1.211.1/32, Intra, cost 1, area 0, Connected
      via 10.1.211.1, Loopback0
*>  10.1.212.1/32, Intra, cost 2, area 0
      via 10.1.30.253, Vlan300
*>  192.168.1.1/32, Intra, cost 2, area 0
      via 10.1.2.2, GigabitEthernet1/0/11
DLS1(config)#
```

```
DLS2(config)#do show ip ospf rib

            OSPF Router with ID (2.2.2.2) (Process ID 1)


                Base Topology (MTID 0)

OSPF local RIB
Codes: * - Best, > - Installed in global RIB

*>  10.1.2.0/30, Intra, cost 2, area 0
      via 10.1.30.252, Vlan300
*   10.1.2.12/30, Intra, cost 1, area 0, Connected
      via 10.1.2.13, GigabitEthernet1/0/11
*   10.1.30.0/24, Intra, cost 1, area 0, Connected
      via 10.1.30.253, Vlan300
*   10.1.99.0/24, Intra, cost 1, area 1, Connected
      via 10.1.99.253, Vlan99
*   10.1.100.0/24, Intra, cost 1, area 1, Connected
      via 10.1.100.253, Vlan100
*   10.1.110.0/24, Intra, cost 1, area 1, Connected
      via 10.1.110.253, Vlan110
*   10.1.120.0/24, Intra, cost 1, area 1, Connected
      via 10.1.120.253, Vlan120
*   10.1.200.0/24, Intra, cost 1, area 1, Connected
      via 10.1.200.253, Vlan200
*>  10.1.203.1/32, Intra, cost 2, area 0
      via 10.1.2.14, GigabitEthernet1/0/11
*>  10.1.211.1/32, Intra, cost 2, area 0
      via 10.1.30.252, Vlan300
*   10.1.212.1/32, Intra, cost 1, area 0, Connected
      via 10.1.212.1, Loopback0
*>  192.168.1.1/32, Intra, cost 3, area 0
      via 10.1.30.252, Vlan300
DLS2(config)#
```

4. **Wrong Allowed trunks**

5. **Wrong IP address assigned on R3 Lo2**

```
R3#show ip int bri
Any interface listed with OK? value "NO" does not have a valid configuration

Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0/0   unassigned      YES unset  administratively down down
GigabitEthernet0/0/1   10.1.2.14       YES TFTP   up                    up
GigabitEthernet0/0/2   unassigned      YES unset  down                  down
Serial0/1/0            unassigned      NO  unset  up                    down
Serial0/1/1            unassigned      NO  unset  up                    down
GigabitEthernet0       unassigned      YES TFTP   administratively down down
Loopback0              10.1.203.1      YES TFTP   up                    up
Loopback1              10.1.80.129     YES TFTP   up                    up
Loopback2              10.1.80.0       YES manual up                    up
R3#
```

Successful ping!!!!!!!!!!!!!!!!!!

```
R1#ping 2.2.2.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R1#
```