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1. Verification of the issue

```
DLS1#show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
1.0.0.1           1   FULL/BDR        00:00:32    10.1.2.2        GigabitEthernet1/0/11
DLS1#
```

```
DLS2#show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
3.0.0.3           1   FULL/BDR        00:00:39    10.1.2.14       GigabitEthernet1/0/11
DLS2#
```

→ no neighbors listed on VLAN 300

2. Troubleshooting method used

- Follow-the-path: starting at the failing adjacency (VLAN 300 between D1 and D2) then checking neighbor table, ospf interface, and interface configs for authentication

3. Steps taken to find the issue(s)

```
DLS1#show ip ospf int vlan 300
Vlan300 is up, line protocol is up
  Internet Address 10.1.30.252/24, Interface ID 49, Area 0
  Attached via Network Statement
  Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
  Topology-MTID    Cost    Disabled    Shutdown      Topology Name
        0           1         no          no            Base
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 1.1.1.1, Interface address 10.1.30.252
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    oob-resync timeout 40
    No Hellos (Passive interface)
  Supports Link-local Signaling (LLS)
  Cisco NSF helper support enabled
  IETF NSF helper support enabled
  Can be protected by per-prefix Loop-Free FastReroute
  Can be used for per-prefix Loop-Free FastReroute repair paths
  Index 1/3/8, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 0, maximum is 0
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
DLS1#
```

```
DLS2#show ip ospf int vlan 300
Vlan300 is up, line protocol is up
  Internet Address 10.1.30.253/24, Interface ID 49, Area 0
  Attached via Network Statement
  Process ID 1, Router ID 2.2.2.2, Network Type BROADCAST, Cost: 1
  Topology-MTID    Cost    Disabled    Shutdown      Topology Name
        0           1         no          no            Base
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 2.2.2.2, Interface address 10.1.30.253
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    oob-resync timeout 40
    Hello due in 00:00:05
  Supports Link-local Signaling (LLS)
  Cisco NSF helper support enabled
  IETF NSF helper support enabled
  Can be protected by per-prefix Loop-Free FastReroute
  Can be used for per-prefix Loop-Free FastReroute repair paths
  Index 1/2/8, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 0, maximum is 0
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
  Cryptographic authentication enabled
    Youngest key id is 1
DLS2#
```

→

```
DLS2#SHOW IP OSPF NEIGHBOR

Neighbor ID     Pri   State           Dead Time   Address         Interface
3.0.0.3           1   FULL/BDR        00:00:35    10.1.2.14       GigabitEthernet1/0/11
DLS2#
```

```
DLS1#SHOW IP OSPF NEIGHBOR

Neighbor ID     Pri   State           Dead Time   Address         Interface
1.0.0.1           1   FULL/BDR        00:00:35    10.1.2.2        GigabitEthernet1/0/11
DLS1#
```

→ No neighbors have been established on vlan 300

```
DLS1#show ip ospf interface vlan 300
Vlan300 is up, line protocol is up
  Internet Address 10.1.30.252/24, Interface ID 49, Area 0
  Attached via Network Statement
  Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
  Topology-MTID    Cost    Disabled    Shutdown      Topology Name
        0           1         no          no            Base
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 1.1.1.1, Interface address 10.1.30.252
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    oob-resync timeout 40
    No Hellos (Passive interface)
  Supports Link-local Signaling (LLS)
  Cisco NSF helper support enabled
  IETF NSF helper support enabled
  Can be protected by per-prefix Loop-Free FastReroute
  Can be used for per-prefix Loop-Free FastReroute repair paths
  Index 1/3/8, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 0, maximum is 0
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
  Cryptographic authentication enabled
      No key configured, using default key id 0
```

```
DLS2#show ip ospf interface vlan 300
Vlan300 is up, line protocol is up
  Internet Address 10.1.30.253/24, Interface ID 49, Area 0
  Attached via Network Statement
  Process ID 1, Router ID 2.2.2.2, Network Type BROADCAST,
  Topology-MTID    Cost    Disabled    Shutdown      Topol
        0           1         no          no            Ba
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 2.2.2.2, Interface address 10.1.3
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40,
    oob-resync timeout 40
    Hello due in 00:00:08
  Supports Link-local Signaling (LLS)
  Cisco NSF helper support enabled
  IETF NSF helper support enabled
  Can be protected by per-prefix Loop-Free FastReroute
  Can be used for per-prefix Loop-Free FastReroute repair
  Index 1/2/8, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 0, maximum is 0
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
  Cryptographic authentication enabled
    Youngest key id is 1
```

→

```
DLS1#show running-config int vlan 300
Building configuration...

Current configuration : 261 bytes
!
interface Vlan300
 ip address 10.1.30.252 255.255.255.0
 no ip proxy-arp
 ip ospf authentication message-digest
 ip ospf message-digest-key 1 md5 7 071C29494F0F
 ipv6 address FE80::D1 link-local
 ipv6 address 2001:DB8:CAFE:300::D1/64
 ipv6 ospf 1 area 0
end

DLS1#
```

```
DLS2#show running-config interface vlan 300
Building configuration...

Current configuration : 481 bytes
!
interface Vlan300
 ip address 10.1.30.253 255.255.255.0
 no ip proxy-arp
 ip ospf authentication message-digest
 ip ospf message-digest-key 1 md5 7 15010309052C
 ipv6 address dhcp
 ipv6 address FE80::D2 link-local
 ipv6 address 2001:DB8:CAFE:300::D2/64
 ipv6 address autoconfig
 ipv6 enable
 ipv6 dhcp client request vendor
 ipv6 ospf authentication ipsec spi 500 sha1 7 135445415F59527D737D7862677147524054590F090901075A564E410101070200
06005E0D515F0107
 ipv6 ospf 1 area 0
end

DLS2#
```

→ missing ip ospf authentication message-digest

→ no MD5 configured

```
DLS2#show run | section router ospf
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 0
 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 3
ipv6 router ospf 1
 router-id 22.22.22.22
 passive-interface default
 no passive-interface Vlan300
 no passive-interface GigabitEthernet1/0/11
DLS2#
```

```
DLS1#show run | section router ospf
router ospf 1
 router-id 1.1.1.1
 passive-interface default
 no passive-interface GigabitEthernet1/0/11
 network 10.1.2.0 0.0.0.3 area 0
 network 10.1.30.0 0.0.0.255 area 0
 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 10.1.211.1 0.0.0.0 area 0
ipv6 router ospf 1
 router-id 11.11.11.11
 passive-interface default
 no passive-interface Vlan300
 no passive-interface GigabitEthernet1/0/11
DLS1#
```

→ confirms only vlan 300 in area 0 was intended to use MD5

4. Description of the issue

1. DLS2 is needed MD5 message-direct authentication for OSPF on VLAN 300
2. DLS1 did not have MD5 authentication configured on that interface

→ DLS1 sent unauthorized hellos and dls2 is expecting md5-authenticated hellos, the packets were rejected and the neighbor relationship on VLAN 300 could not form, breaking the secure ospf peering

5. Commands entered to fix the issue

6. Verification the issue is resolved

```
DLS1#ping 10.1.30.253
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.30.253, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/3 ms
DLS1#
```

```
DLS2#ping 10.1.30.252
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.30.252, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
DLS2#
```

```
DLS1#ping 10.1.30.253
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.30.253, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/3 ms
DLS1#show ip route ospf
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, 18 subnets, 3 masks
O IA     10.1.1.0/30 [110/2] via 10.1.2.2, 00:41:31, GigabitEthernet1/0/11
O        10.1.201.1/32 [110/2] via 10.1.2.2, 00:41:31, GigabitEthernet1/0/11
O IA     10.1.202.1/32 [110/3] via 10.1.2.2, 00:41:31, GigabitEthernet1/0/11
DLS1#
```

```
DLS2#show ip route ospf
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, 16 subnets, 3 masks
O IA     10.1.203.1/32 [110/2] via 10.1.2.14, 00:43:47, GigabitEthernet1/0/11
```