

OSPF-How to propagate a default route to the non-backbone area? (Stub area,DFL-1660 and DGS-3612)

[Prerequisites]

- 1.The essential knowledge of OSPF version 2.
- 2.DFL-1660 x1 (Firmware version 2.27.04.01-TP)
- 3.DFL-3612 x1 (Firmware version 2.80.B50)

Note. If you test the scenario by earlier firmware versions (Netdefend series, v2.27.02.11 or eariler), you will encounter following known issues on Netdefend series:

1. The LSA database will not be updated when link status changes.
2. The OSPF-Hello packets send periodically from the interface which has been set to "Passive" interface.

[Scenario]

In the current scenario, DFL-1660 works as a last hop (edge router) in this OSPF autonomous system, in another words, all the traffic inside DFL-1660 only has one way out that is via DGS-3612, therefore DFL-1660 is not necessary to exchange or learn the routing entries from LSA-TYPE5 and LSA-TYEP4, only the default route and some interior routing entries(LSA-Type1,LSA-Type2 and partial LSA-Type3) are required.

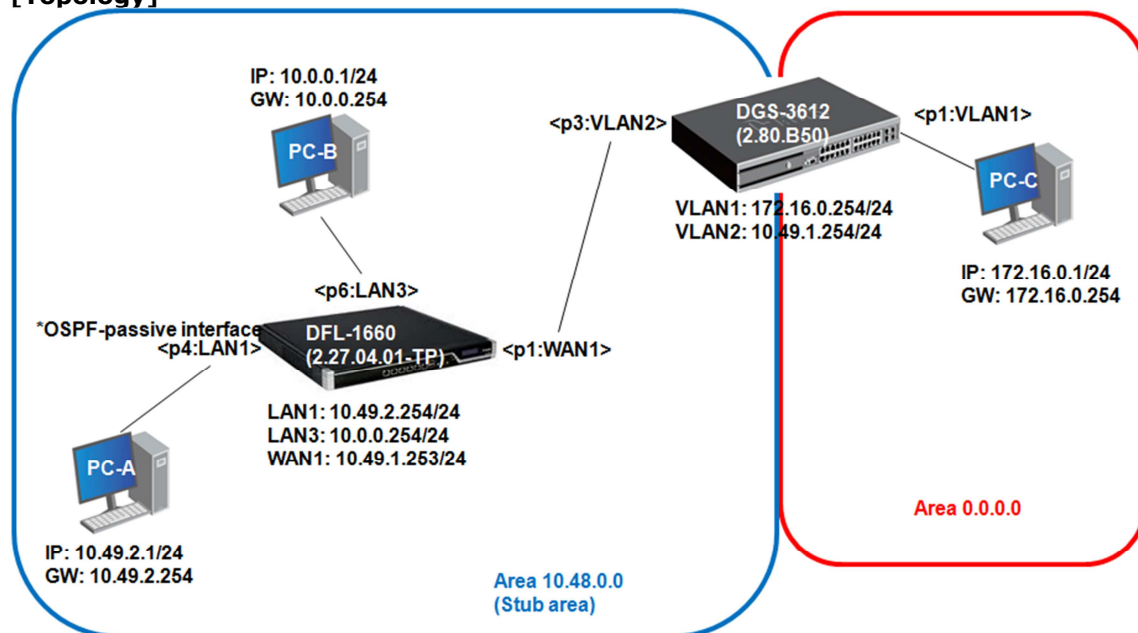
Based on the previous description, the best implement will be set this non-backbone area to "Stub area" or "Total Stubby area", in the case we will demonstrate HOW-TO for the "Stub area". Below is the compared table for each kind of area.

Link State Types	Type 1 & 2	Type 3	Type 4	Type 5	Type 7
Bcakbone (area 0)	YES	YES	YES	YES	No
Non-backbone, non-stub	YES	YES	YES	YES	No
Stub	YES	YES	No	No	No
Totally Stubby	YES	No*	No	No	No
Not-so Stubby	YES	YES	YES	No	YES

Table of which LSAs are allowed in which areas.

* No Type 3 (ASR Summary LSA) except for a single type 3 LSA to advertise the default route

[Topology]



[Configuration]

The settings of DGS-3612

```
#####
config ipif System ipaddress 172.16.0.254/24 state enable
config vlan default delete 3
create vlan v2 tag 2 type 1q_vlan
config vlan v2 add untagged 3
create ipif if-v2 10.49.1.254/24 v2 state enable
#Configure the Area 10.48.0.0 to Stub Area
create ospf area 10.48.0.0 type stub
config ospf ipif if-v2 area 10.48.0.0 state enable
config ospf ipif System area 0.0.0.0 state enable
enable ospf
```

#####

The settings of DFL-1660

```
#####
set Interface Ethernet wan1 DHCPEnabled=No AutoDefaultGatewayRoute=No
AutoInterfaceNetworkRoute=No
set Interface Ethernet lan1 DHCPEnabled=No AutoDefaultGatewayRoute=No
AutoInterfaceNetworkRoute=No
set Address IP4Address InterfaceAddresses/wan1_ip Address=10.49.1.253
set Address IP4Address InterfaceAddresses/wan1net Address=10.49.1.0/24
set Address IP4Address InterfaceAddresses/lan1_ip Address=10.49.2.254
set Address IP4Address InterfaceAddresses/lan1net Address=10.49.2.0/24
set Address IP4Address InterfaceAddresses/lan3_ip Address=10.0.0.254
set Address IP4Address InterfaceAddresses/lan3net Address=10.0.0.0/24
set Interface Ethernet wan2 AutoInterfaceNetworkRoute=No AutoDefaultGatewayRoute=No
set Interface Ethernet lan2 AutoInterfaceNetworkRoute=No AutoDefaultGatewayRoute=No
set Interface Ethernet dmz AutoInterfaceNetworkRoute=No AutoDefaultGatewayRoute=No
add OSPFProcess ospf-100 RouterID=InterfaceAddresses/lan1_ip
cc OSPFProcess ospf-100
add OSPFArea area-10-48-0-0 AreaID=10.48.0.0 Stub=Yes
cc OSPFArea area-10-48-0-0
# There has no router behind LAN1 interface, therefore we can set the LAN1 interface to
Passive interface prevent from leaking the routing information.
add OSPFInterface lan1 Passive=Yes Network=InterfaceAddresses/lan1net
add OSPFInterface wan1 Network=InterfaceAddresses/wan1net
cc
add DynamicRoutingRule OSPFProcess=ospf-100 From=OSPF LogEnabled=Yes Name=import-ospf-
to-main
cc DynamicRoutingRule 1(import-ospf-to-main)
add DynamicRoutingRuleAddRoute Destination=main OverwriteDefault=Yes
cc
add Interface InterfaceGroup L1-L3-W1 Members=lan1,lan3,wan1
add IPRule Action=Allow SourceInterface=L1-L3-W1 SourceNetwork=all-nets
DestinationInterface=L1-L3-W1 DestinationNetwork=all-nets Service=all_services Index=1
LogEnabled=Yes Name=allow-L1-L3-W1

cc RoutingTable main
add Route Interface=wan1 Network=InterfaceAddresses/wan1net RouteMonitor=Yes
MonitorLinkStatus=Yes
add Route Interface=lan1 Network=InterfaceAddresses/lan1net RouteMonitor=Yes
MonitorLinkStatus=Yes
```

Save then Activate

#####

[Expected result]

In the DFL-1660

1. Check the OSPF database by issuing the command of "**ospf -database -verbose**", there shall

have following information:

```
DFL-1660:/> ospf -database -verbose
-----
      OSPF Router with ID 10.49.2.254 (ospf-100)
            Router Link States (Area 10.48.0.0)

ID   Link ID          ADV Router      Age   Seq#           Chksum  Link count
16   10.49.2.254      10.49.2.254    178  0x8000000d    0x8773  2
     Transit network 10.49.1.254:10.49.1.253 [cost:10] [flags:]
     Stub 10.49.2.0:255.255.255.0 [cost:10] [flags:]

32   172.16.0.254    172.16.0.254   179  0x80000004    0x6bf7  1
     Transit network 10.49.1.254:10.49.1.254 [cost:1] [flags:B]

            Net Link States (Area 10.48.0.0)

ID   Link ID          ADV Router      Age   Seq#           Chksum
39   10.49.1.254      172.16.0.254   179  0x80000001    0x3934
     172.16.0.254/255.255.255.0
     10.49.2.254/255.255.255.0

            Summary Link States (Area 10.48.0.0)

ID   Link ID          ADV Router      Age   Seq#           Chksum
43   0.0.0.0          10.49.2.254    163  0x80000001    0x9d85
     0.0.0.0/0.0.0.0 [cost:0]

33   0.0.0.0          172.16.0.254   168  0x80000004    0x019e
     0.0.0.0/0.0.0.0 [cost:1]

34   172.16.0.0       172.16.0.254   221  0x80000001    0x8164
     172.16.0.0/255.255.255.0 [cost:1]

-----
DFL-1660:/> █
```

2. Check the neighbor's status by issuing the command of "**ospf -neighbor**", there shall have following information:

```
DFL-1660:/> ospf -neighbor
-----
Neighbor: 172.16.0.254 (10.49.1.254)
Interface: wan1
Prio: 1
Options:
State: FULL
Expire: 33
DR: 10.49.1.254
BDR: 10.49.1.253

ID   Type              Link ID          Age   Seq#
-----
39   Network-LSA       10.49.1.254     263  0x80000001
34   Summary-LSA (IP)  172.16.0.0      305  0x80000001
33   Summary-LSA (IP)  0.0.0.0         252  0x80000004
32   Router-LSA        172.16.0.254    263  0x80000004
-----
```

3. Check the routing table by issuing the command of "**routes**", there shall have following routing information, the flag "**O**" stands for the routing learnt from OSPF.

```
DFL-1660:/> routes
Flags Network          Iface      Gateway      Local IP      Metric
-----
M   10.49.1.0/24        wan1
M   10.49.2.0/24        lan1
O   172.16.0.0/24       wan1        10.49.1.254  11
O   10.0.0.0/24         lan3        10.49.1.254  100
O   0.0.0.0/0           wan1        10.49.1.254  11
DFL-1660:/>
```

In the DGS-3612

1. Check the neighbor's status by issuing the command of "**show ospf all**" and "**show ospf neighbor**".

```
DGS-3612:admin#show ospf all
Command: show ospf all

Interface Name: if-v2                IP Address: 10.49.1.254/24 (Link Up)
Network Medium Type: BROADCAST      Metric: 1
Area ID: 10.48.0.0                  Administrative State: Enabled
Priority: 1                           DR State: DR
DR Address: 10.49.1.254              Backup DR Address: 10.49.1.253
Hello Interval: 10                   Dead Interval: 40
Transmit Delay: 1                    Retransmit Time: 5
Authentication: None

Interface Name: System                IP Address: 172.16.0.254/24 (Link Up)
Network Medium Type: BROADCAST      Metric: 1
Area ID: 0.0.0.0                    Administrative State: Enabled
Priority: 1                           DR State: DR
DR Address: 172.16.0.254              Backup DR Address: None
Hello Interval: 10                   Dead Interval: 40
Transmit Delay: 1                    Retransmit Time: 5
Authentication: None

Total Entries : 2
```

```
DGS-3612:admin#show ospf neighbor
Command: show ospf neighbor

IP Address of Neighbor      Router ID of Neighbor      Neighbor Priority Neighbor State
-----
10.49.1.253                 10.49.2.254               1                       Full

Total Entries : 1

DGS-3612:admin#show ospf neighbor 10.49.1.253
Command: show ospf neighbor 10.49.1.253

Neighbor ID: 10.49.2.254      IP Address: 10.49.1.253
Neighbor Options: 0           Neighbor Priority: 1
Neighbor State: Full          State Changes: 5 times
```

2. Check the routing table by issuing the command of "**show iproute**", there shall have following routing information:

```
DGS-3612:admin#show iproute
Command: show iproute
```

Routing Table

IP Address/Netmask	Gateway	Interface	Cost	Protocol
10.49.1.0/24	0.0.0.0	if-v2	1	Local
10.49.2.0/24	10.49.1.253	if-v2	11	OSPF
172.16.0.0/24	0.0.0.0	System	1	Local

```
Total Entries : 3
```

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