

GWN78XX Series - OSPF Guide

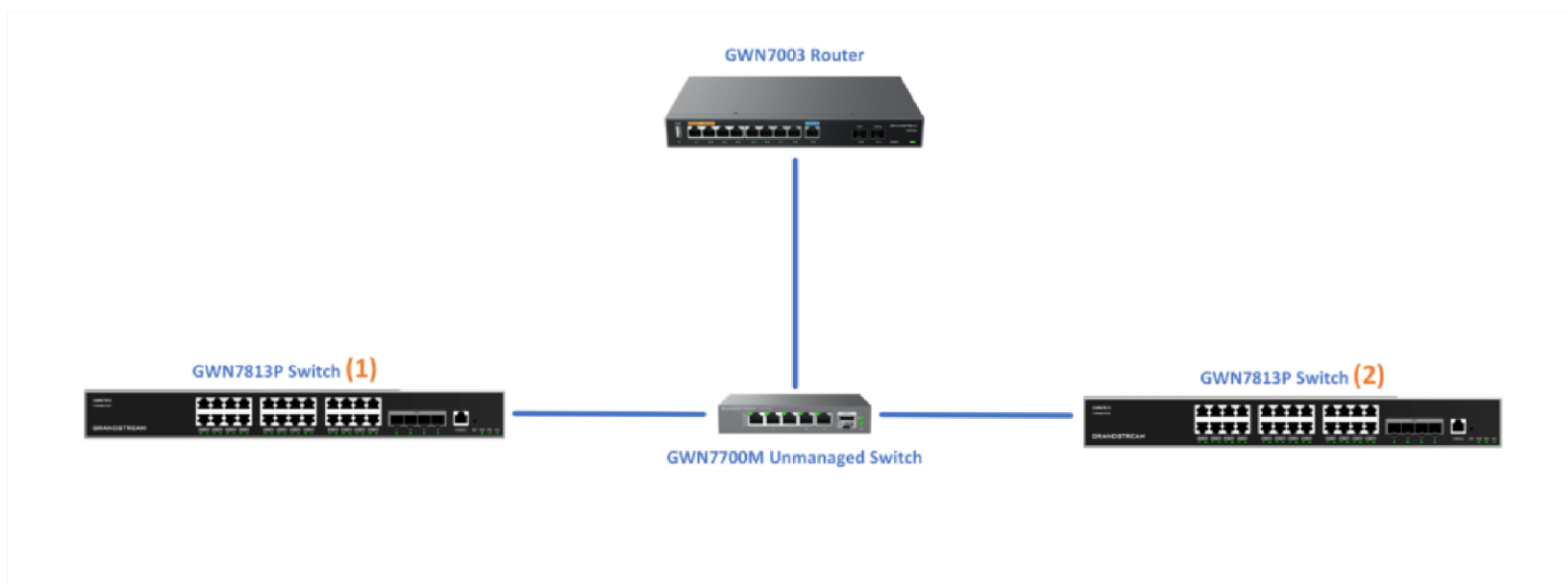
OVERVIEW

OSPF stands for Open Shortest Path First, it's a routing protocol and uses a link-state routing algorithm, in other words, it collects information about the state of each link in the network to build an overall map of the whole network topology. OSPF is an interior gateway protocol (IGP) same as RIP (Routing Information Protocol), it's a protocol based on distance vector algorithms. OSPF has many advantages over other routing protocols, such as RIP.

Some Advantages of OSPF protocol:

- OSPF can perform route summarization, which reduces the size of the routing table and improves scalability.
- OSPF supports IPv4 and IPv6.
- OSPF can split the network into areas, which are logical groups of routers that share the same link state information. This reduces the amount of routing information that needs to be exchanged and processed by each router.
- OSPF can use authentication to secure the exchange of routing information between routers.
- OSPF can deal with variable-length subnet masks (VLSM), which allows for more efficient use of IP addresses and network design.




In this example, we will be using two GWN781x(P) switches directly connected (neighbors) and a router serving as a DHCP server. Please refer to the figure below:



Example – two GWN781x(P)

CONFIGURATION

Step 1:

-  Enable OSPF
-  Set router ID
-  Set area ID and area type

Web GUI

To start using OSPF, please navigate to **Web UI** → **Routing** → **OSPF**:

1. Toggle ON OSPF and enter the Router ID (it can be any IPv4 address) then scroll down to the bottom of the page and click the **"OK"** button, please refer to the figure below:

OSPF – Global

2. Adding a new area to the switch can be performed only using CLI, please refer to the corresponding command in the following section. Once, a new area is added, the user can modify the type by clicking on the edit icon.

Edit Area

3. Repeat the same steps on the other switches.

CLI

1. Enter the switch's global configuration mode by entering the command below.

```
GWN7813P# config
```

2. Then enable OSPF in the switch by using the command below

```
GWN7813P(config)# router ospf
```

3. Set a router ID for the switch, this ID is used purely to identify the switch with the OSPF configuration. The ID takes the format of IPv4 format. To set the router ID, please enter the command below.

```
GWN7813P(config-ospf-router)# router-id 1.1.1.1
```

4. By default, the switch is set with the area ID 0, which is the backbone area. This area cannot be set as a Standard area, Stub area, Totally Stubby area, or Not So Stubby area. In this example, we're setting the switch to a stub area 1

with no summary area type, also known as the Totally Stubby area.




```
GWN7813P(config-ospf-router)# area 1 stub no-summary
```

5. Repeat the same steps on the other switches while considering giving each switch a unique router ID, otherwise OSPF might not work as intended or not work at all.

Note











If an adjacency relationship has been established, the OSPF process needs to be rebooted for the router ID to take effect. Caution: this action will invalidate OSPF routing and result in recalculation. Please use it with caution.

Step 2:

-  Enable OSPF on the interface
-  View the neighbor information
-  View the routing table and the new OSPF-acquired routes

Web GUI

On the Interface Settings tab, click on the **"Edit"** icon to enable the [VLAN IP Interface](#).

OSPF							
Global	Area Settings	Interface Settings	NBMA Neighbor	Neighbor Info	Database Info		
Interface	Status	Interface Address	Area ID	Network Type	Interface Suppression	Ignore MTU Validation	LS In Operation
VLAN 1	Enabled	192.168.80.211/24	0.0.0.0	Broadcast	Disabled	Disabled	5  
VLAN 7	Enabled	70.0.0.1/24	0.0.0.0	Broadcast	Disabled	Disabled	5  
VLAN 10	Enabled	10.0.0.1/8	0.0.0.0	Broadcast	Disabled	Disabled	5  
VLAN 20	Enabled	20.0.0.1/24	0.0.0.0	Broadcast	Disabled	Disabled	5  
VLAN 90	Enabled	90.0.0.1/24	0.0.0.0	Broadcast	Disabled	Disabled	5  

OSPF – Interface Settings

Toggle ON the OSPF on the selected interface then scroll down and click on **"OK"** button.

Interface Settings > **Edit Interface**

Interface: VLAN 10

Interface Address: 10.0.0.1/24

OSPF:

Area ID: 0.0.0.0 Must be in IPv4 format or within range 0-4294967295

Network Type: Broadcast

Interface Suppression:

Ignore MTU Validation:

LSA Retransmission Interval (s): 5 Valid range is 3-65535

LSA Transmission Delay (s): 1 Valid range is 1-500

Fast Hello:

Hello Interval (s): 10 Valid range is 1-65535

Neighbor Expiration Interval (s): 40 Valid range is 1-65535

OSPF – Interface Settings – Edit Interface

Please do the same steps on the second switch, then on the **Neighbor Info** tab, click on the **"refresh"** button for the adjacent (directly connected) switches to appear.

OSPF

Global Area Settings Interface Settings NBMA Neighbor Neighbor Info Database Info

Refresh

Neighbor ID	Priority	Status	Dead Time	Neighbor Address	Interface Address	Up Time	Operation
192.168.80.116	1	Full/DR	39.660s	192.168.80.116	vlan1:192.168.80.211	0000:00:35:12	ⓘ

OSPF – Neighbor Info

Navigate to the Routing table **Web UI → Routing → Routing table** to confirm that the routing table contains routes to the previously created VLAN IP Interfaces on the other switch. Please refer to the figure below:

Routing Table

IPv4 Routing Table IPv6 Routing Table

Refresh

All Types

Destination IP Address	Mask Length	Protocol Type	Priority	Next Hop	Outgoing Interface	Flags ⓘ
0.0.0.0	0	DHCP	1	192.168.80.1	VLAN 1	SFA
192.168.80.0	24	Direct	0	0.0.0.0	VLAN 1	SFA
192.168.7.0	24	Static	1	0.0.0.0	VLAN 1	SFA
90.0.0.0	24	OSPF	110	192.168.80.211	VLAN 1	SFA
80.0.0.0	16	Static	1	0.0.0.0	VLAN 1	SFA
70.0.0.0	24	OSPF	110	192.168.80.211	VLAN 1	SFA
50.0.0.0	24	OSPF	110	192.168.80.211	VLAN 1	SFA
20.0.0.0	24	OSPF	110	192.168.80.211	VLAN 1	SFA
10.0.0.0	8	OSPF	110	192.168.80.211	VLAN 1	SFA

IPv4 Routing Table

To check the **LSDB** (Link State DataBase), click on the **Database Info tab**, select the type (database) then click on the **“Query”** Button to see the Database info which is a list of all **LSA** (Link State Advertisements) that the OSPF routers use to get information about other routers running OSPF protocol and that is what helps to populate the routing table for the best route to each destination.

OSPF

Global Area Settings Interface Settings NBMA Neighbor Neighbor Info Database Info

Type database

Self-Originate database

asbr-summary

nssa-external

external

network

summary

router

opaque-link

Database Info

OSPF Router with ID (192.168.80.116)

Router Link States (Area 0.0.0.0)

Link ID	ADV Router	Age	Seq#	CkSum	Link count
192.168.80.116	192.168.80.116	359	0x8000000b	0xf730	1
192.168.80.211	192.168.80.211	201	0x80000015	0x6275	5

Net Link States (Area 0.0.0.0)

Link ID	ADV Router	Age	Seq#	CkSum
192.168.80.211	192.168.80.211	360	0x80000003	0xa0e0

Summary Link States (Area 0.0.0.0)

Link ID	ADV Router	Age	Seq#	CkSum	Route
50.0.0.0	192.168.80.211	201	0x80000001	0x0e85	50.0.0.0/24
192.168.13.0	192.168.80.211	3	0x80000001	0x59f5	192.168.13.0/24

OSPF – Database Info

CLI

1. From the switch's global configuration mode, please enter the following command to enter the VLAN interface setting. In this example, we are using VLAN ID 20.

```
GWN7813P(config)# int vlan 20
```

2. Then enable OSPF in the VLAN interface and specify the area to which this interface belongs.

```
GWN7813P(config-if)# ip ospf area 1
```

3. Repeat steps 1 and 2 on the other switches

4. Check the OSPF information on one of the switches.

```
GWN7813P# show ip ospf route
```

SUPPORTED DEVICES

The table below lists all the devices which this guide applies to with the respective minimum firmware version of each model.

Supported Models	Minimum Firmware Version
GWN7811(P)	1.0.1.8
GWN7812P	
GWN7813P	
GWN7816(P)	1.0.3.8
GWN7830	1.0.3.1
GWN7831	1.0.3.1
GWN7832	1.0.3.1