Manuals+ — User Manuals Simplified.

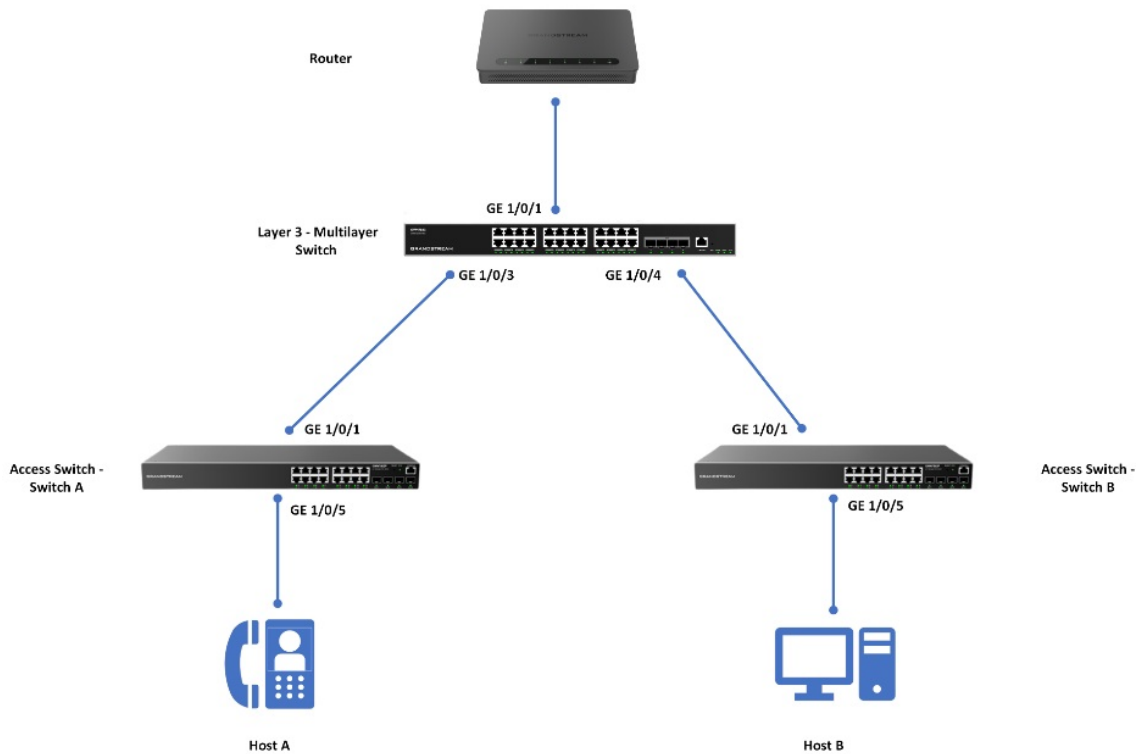# Documentation GWN78XX Series Multi Layer Switching User Guide

Contents

Documentation GWN78XX Series Multi Layer Switching

Product Information

Specifications

- Product Model: GWN78XX Series
- Protocol: OSPF (Open Shortest Path First)
- Routing Algorithm: Link-State
- Interior Gateway Protocol: Yes

Product Usage Instructions

Configuration:

Step 1

1. **Enable OSPF:** Set router ID, area ID, and area type.
    - **Web GUI:** Navigate to Web UI Routing OSPF, toggle ON OSPF, enter Router ID, and click OK.
    - **CLI:** Enter global configuration mode, enable OSPF, set router ID, and define area type.
2. Repeat the steps on other switches.

Interface Configuration:

Step 2:

1. **Enable OSPF on the interface:** View neighbor

   information and routing table.
    - **Web GUI:** Edit VLAN IP Interface settings.
    - **CLI:** Enter VLAN interface settings to view LSDB and query database info.

Frequently Asked Questions (FAQ)

- **Q: What is OSPF and how does it differ from RIP?**
  A: OSPF (Open Shortest Path First) is a link-state routing protocol that collects information about network links to build a topology map. It differs from RIP (Routing Information Protocol) by using a more advanced algorithm and offering various advantages over RIP.
- **Q: How to set a unique router ID for each switch in OSPF configuration?**
  A: In OSPF configuration, you can set a unique router ID for each switch by following the steps outlined in the user manual. It is crucial to ensure that each switch has a distinct router ID to prevent issues with OSPF functionality.

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:
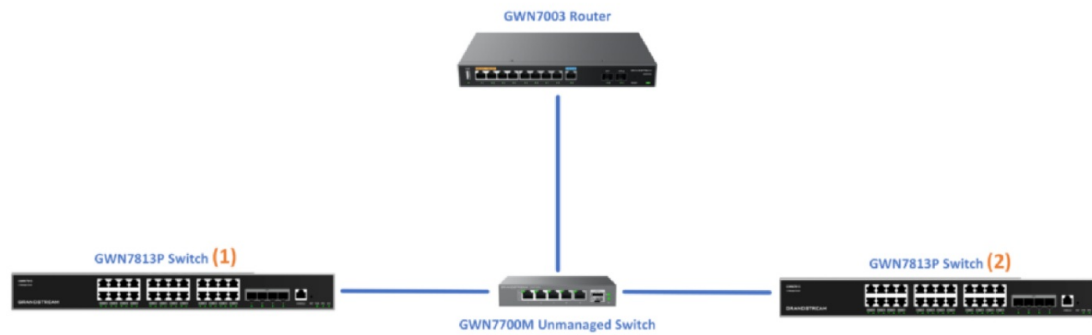
Example – two GWN781x(P)

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.

Area Settings > **Edit Area**

Area ID	0.0.0.2
Area Type	○ None ● Stub ○ NSSA
No Summary	🔵

Cancel OK

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 – Interface Settings

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

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 – 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 | Q Destination IP Address/Next... |

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

database
asbr-summary
nssa-external
external
network
summary
router
opaque-link

Self-Originate

Database Info

```
        OSPF Router with ID (19

              Router Link St

    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

Documents / Resources

Documentation GWN78XX Series Multi Layer Switching [pdf] User Guide
7813P, 781x P, GWN78XX Series Multi Layer Switching, GWN78XX, Series Multi Layer Switching, Multi Layer Switching, Layer Switching, Switching

References

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- **documentation.grandstream.com/wp-content/uploads/2023/07/Screenshot-2023-08-07-163403.jpg**
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- **documentation.grandstream.com/wp-content/uploads/2023/08/Switching-1.png**
- **User Manual**