

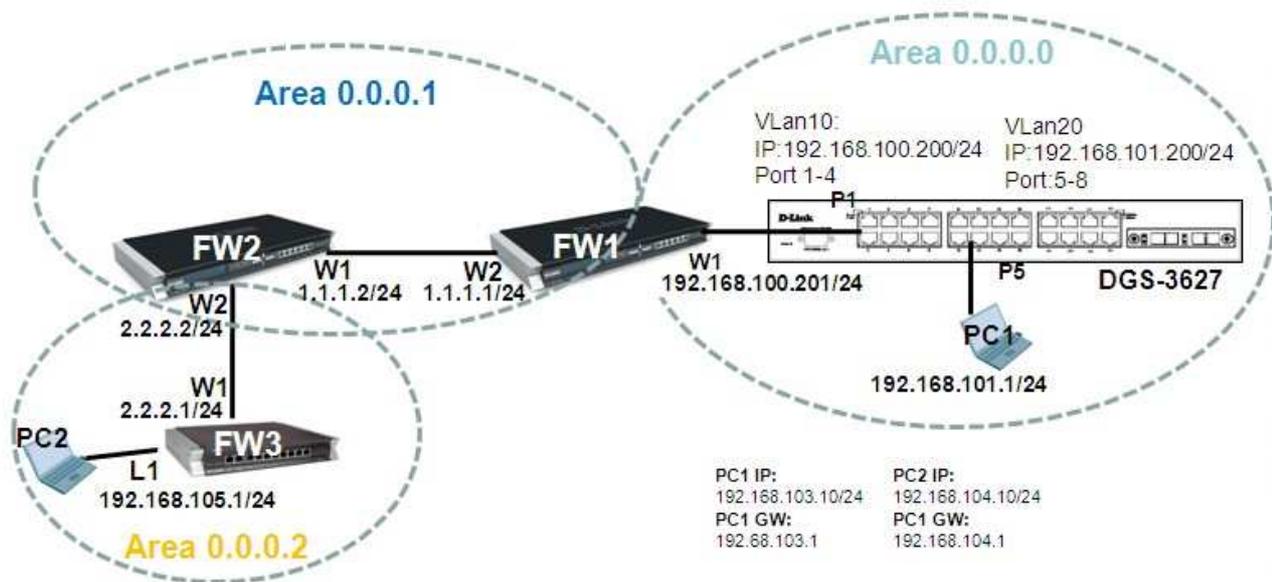
How to connect OSPF mutiple area with virtual link

Before the scenario hands-on, we assume that the readers already along with following abilities:

1. Basic knowledge of OSPF.
2. Basic concept of IP routing.

Scenario summary:

DFL-210/800/1600/2500 f/w:v2.26 or later



Object:

Enable OSPF routing protocol in the scenario above, and SW1 can learn FW3's lan1 interface route and FW3 can learn SW1's vlan20 route with any routing redistribution. Note in this scenario, FW3 must use OSPF virtual link to connect back to area 0.0.0.0, according to OSPF protocol define.

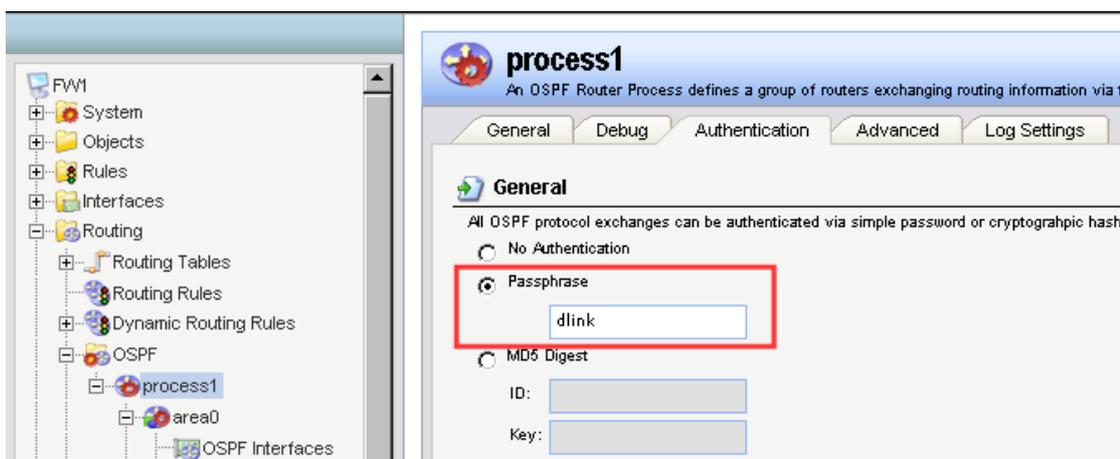
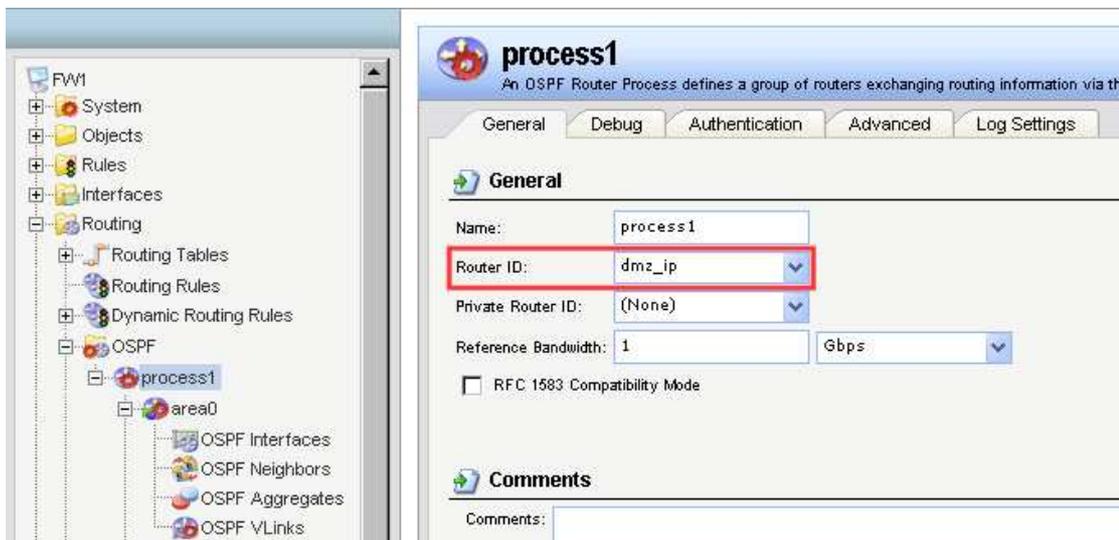
FW1

Step1. Set the IP address for LAN and WAN respectively

```
FW1:/> routes -all -verbose
```

Flags	Network	Iface	Gateway	Local IP	Metric
	10.1.2.1	core	(Iface IP)		0
	10.1.1.1	core	(Iface IP)		0
	192.168.103.1	core	(Iface IP)		0
	10.1.3.1	core	(Iface IP)		0
	1.1.1.1	core	(Iface IP)		0
	192.168.100.201	core	(Iface IP)		0
	127.0.0.1	core	(Shared IP)		0
	192.168.100.0/24	wan1			100
	1.1.1.0/24	wan2			100
	10.1.3.0/24	dmz			100
	192.168.103.0/24	lan1			100
	10.1.1.0/24	lan2			100
	10.1.2.0/24	lan3			100
	224.0.0.0/4	core	(Iface IP)		0

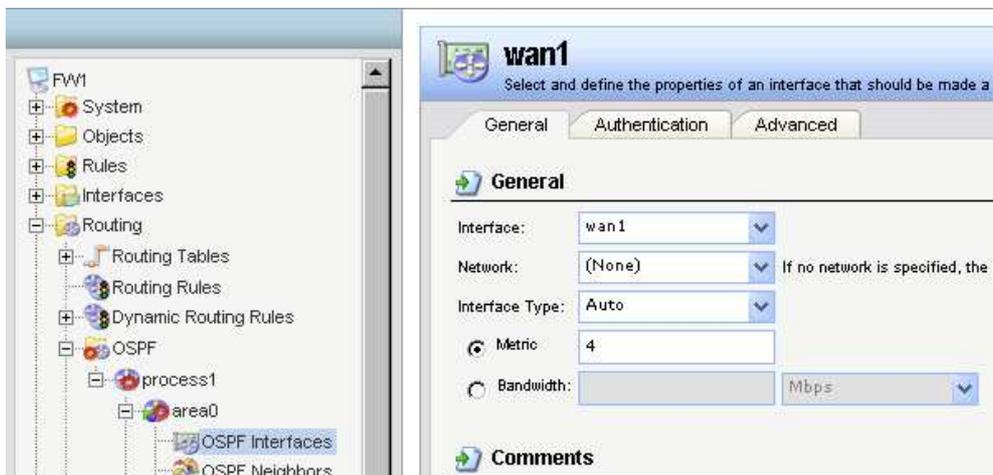
Step2. Create an OSPF process as the screenshot. Note the Route ID option will be used on remote neighbor's virtual link setting. And then enable authentication feature. In this case, use 'dlink' to be a pre-share key



Step3. Create an OSPF area, 0.0.0.0.



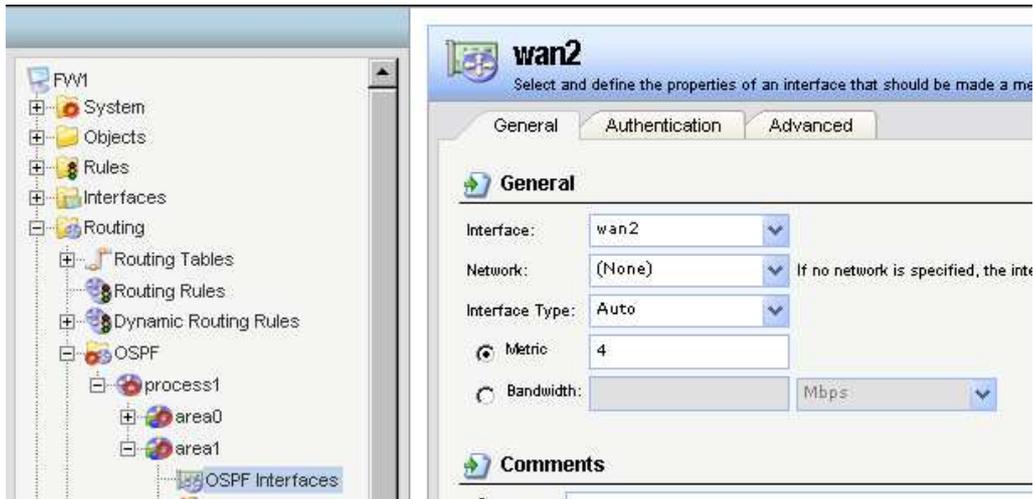
Step4. Add interface wan1 in area 0.0.0.0.



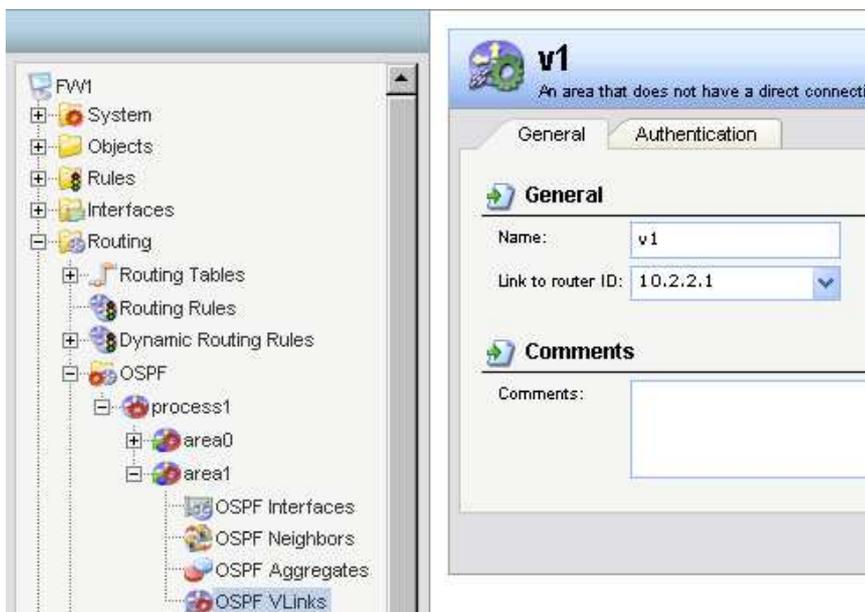
Step5. Create another OSPF area, 0.0.0.1.



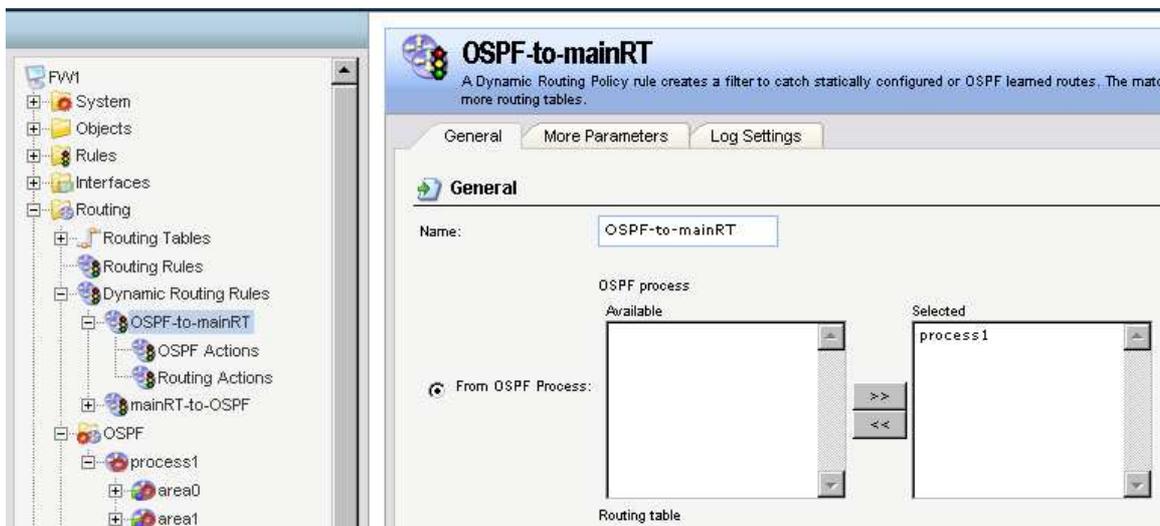
Step6. Add interface wan2 in area 0.0.0.1.



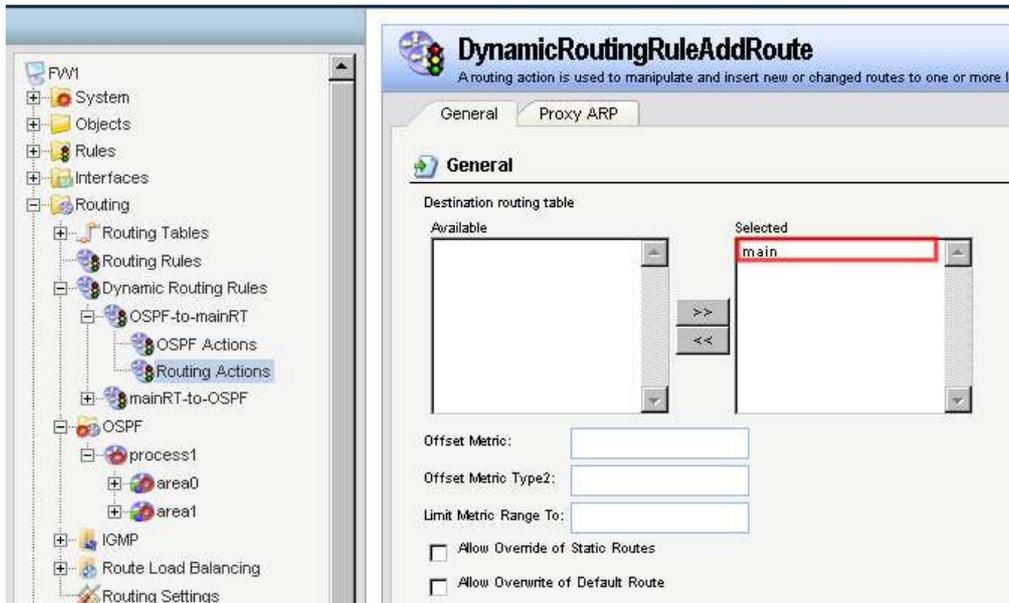
Step7. Enable OSPF virtual link feature and put the remote router’s OSPF id in the ‘Link to router ID’ option. In this case, should use the FW2’s OSPF ID



Step8. Create a Dynamic Routing Rules to allow the routes are learnt by OSPF to inject in main routing table



Step9. In the rule created above, add a Routing Actions as the screenshot. Select “main” routing table to be the Destination Routing table.



Step10. Add two IPrules for the PC1 and PC2

IP Rules
IP rules are used to filter IP-based network traffic. In addition, they provide means for address translation as well as Server Load Balancing.

Add ▾

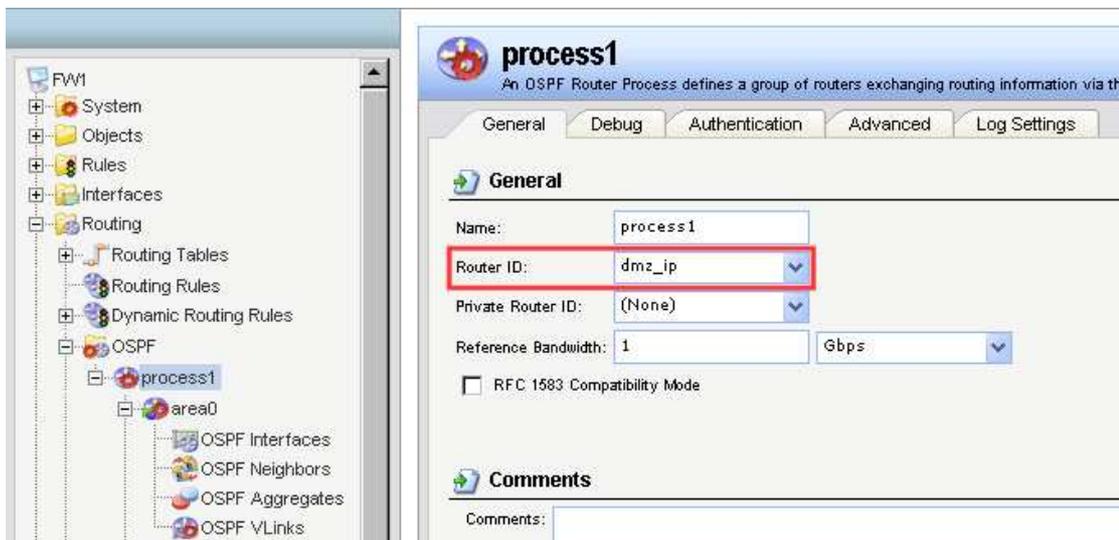
#	Name	Action	Src If	Src Net	Dest If	Dest Net	Service
1	wan2-to-wan1	Allow	wan2	192.168.105.0/24	wan1	192.168.101.0/24	all_tcpudpicmp
2	wan1-to-wan2	Allow	wan1	192.168.101.0/24	wan2	192.168.105.0/24	all_tcpudpicmp

FW2

Step1. Set the IP address for LAN and WAN respectively

```
FW2:/> routes -all -verbose
Flags Network          Iface          Gateway        Local IP       Metric
-----
10.2.4.1              core           (Iface IP)     0
10.2.3.1              core           (Iface IP)     0
192.168.104.1        core           (Iface IP)     0
10.2.2.1              core           (Iface IP)     0
2.2.2.2              core           (Iface IP)     0
1.1.1.2              core           (Iface IP)     0
127.0.0.1            core           (Shared IP)    0
1.1.1.0/24           wan1           100
2.2.2.0/24           wan2           100
10.2.2.0/24          dmz            100
192.168.104.0/24    lan1           100
10.2.3.0/24          lan2           100
10.2.4.0/24          lan3           100
224.0.0.0/4         core           (Iface IP)     0
```

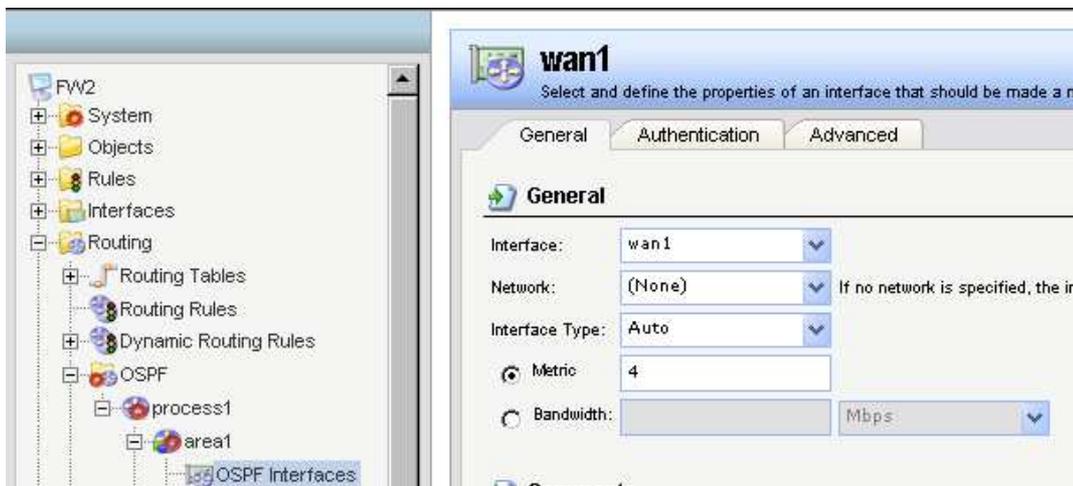
Step2. Create an OSPF process as the screenshot. Note the Route ID option will be used on remote neighbor's virtual link setting. And then enable authentication feature. In this case, use 'dlink' to be a pre-share key



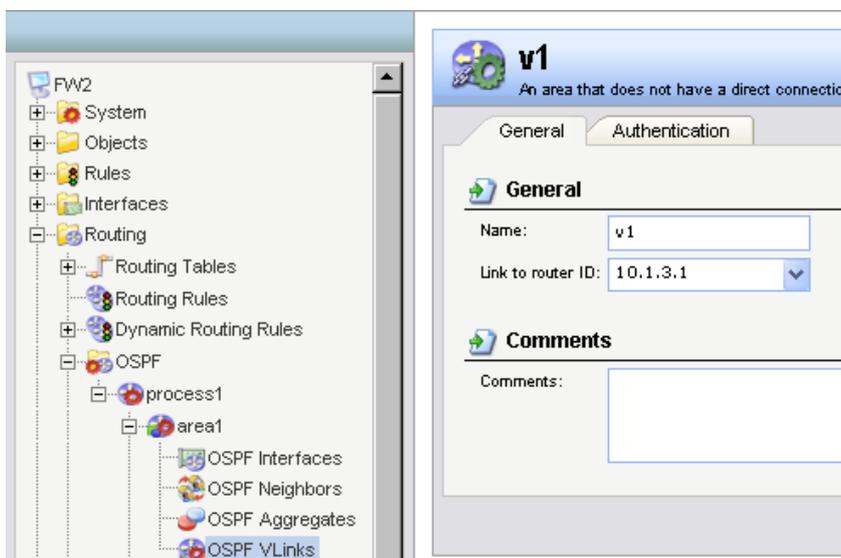
Step3. Create an OSPF area, 0.0.0.1.



Step4. Add interface wan1 in area 0.0.0.1.



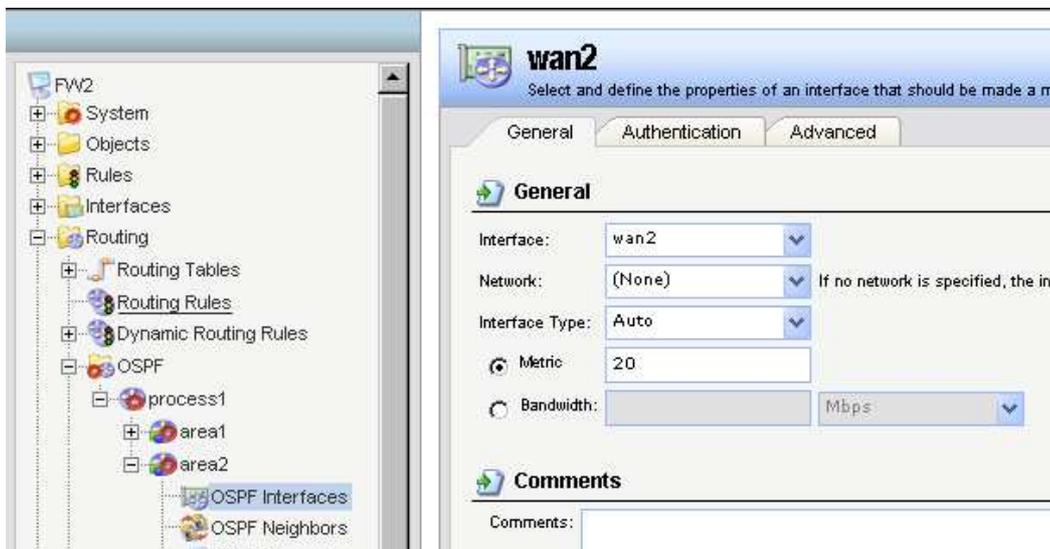
Step5. Enable OSPF virtual link feature and put the remote router's OSPF id in the 'Link to router ID' option. In this case, should use the FW1's OSPF ID



Step6. Create another OSPF area, 0.0.0.2.



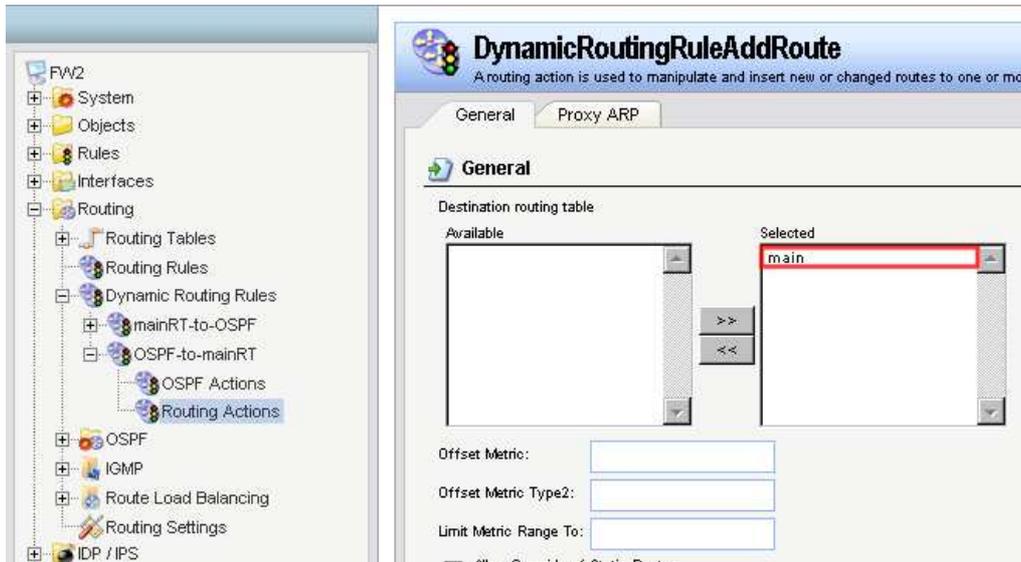
Step7. Add interface wan2 in area 0.0.0.2.



Step8. Create a Dynamic Routing Rules to allow the routes are learnt by OSPF to inject in main routing table



Step9. In the rule created above, add a Routing Actions as the screenshot. Select "main" routing table to be the Destination Routing table.



Step10. Add two IPrules for the PC1 and PC2

IP Rules
IP rules are used to filter IP-based network traffic. In addition, they provide means for address translation as well as Server Load Balancing.

Add ▾

#	Name	Action	Src If	Src Net	Dest If	Dest Net	Service
1	wan2-to-wan1	Allow	wan2	192.168.105.0/24	wan1	192.168.101.0/24	all_tcpudpicmp
2	wan1-to-wan2	Allow	wan1	192.168.101.0/24	wan2	192.168.105.0/24	all_tcpudpicmp

FW3

Step1. Set the IP address for LAN and WAN respectively

```
FW3:/> routes -all -verbose
```

Flags	Network	Iface	Gateway	Local IP	Metric
	192.168.105.1	core	(Iface IP)		0
	172.17.100.254	core	(Iface IP)		0
	192.168.120.254	core	(Iface IP)		0
	2.2.2.1	core	(Iface IP)		0
	127.0.0.1	core	(Iface IP)		0
	2.2.2.0/24	wan1			100
	192.168.120.0/24	wan2			100
	172.17.100.0/24	dmz			100
	192.168.105.0/24	lan			100
	224.0.0.0/4	core	(Iface IP)		0

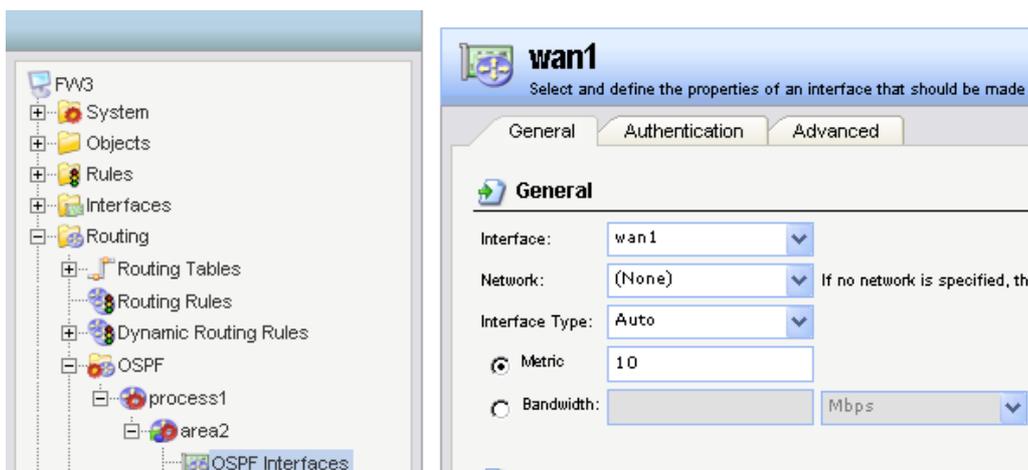
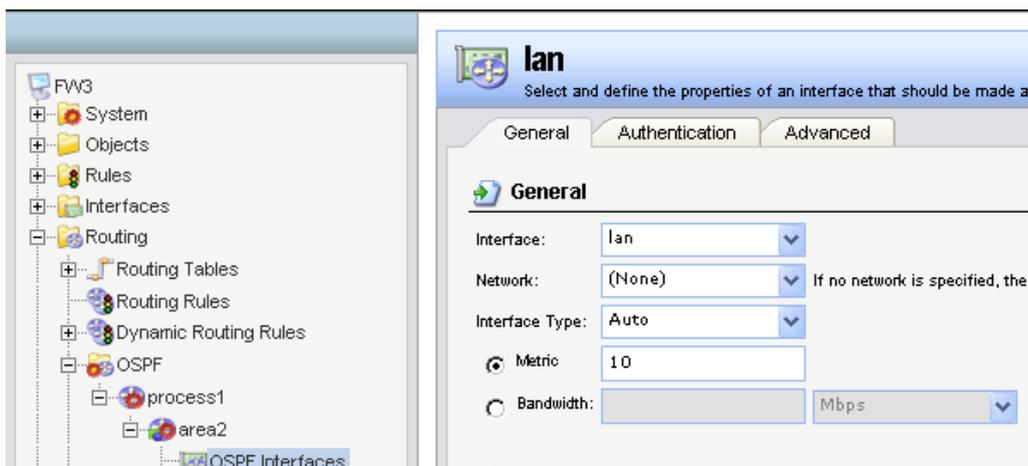
Step2. Create an OSPF process as the screenshot. And then enable authentication feature. In this case, use 'dlink' to be a pre-share key

The image displays two screenshots of the OSPF process configuration interface. The top screenshot shows the 'General' tab with the following settings: Name: process1, Router ID: dmz_ip, Reference Bandwidth: 1 Gbps, and RFC 1583 Compatibility Mode is unchecked. The bottom screenshot shows the 'Authentication' tab with 'Passphrase' selected and 'dlink' entered in the text field. The 'ID' and 'Key' fields are also visible but empty.

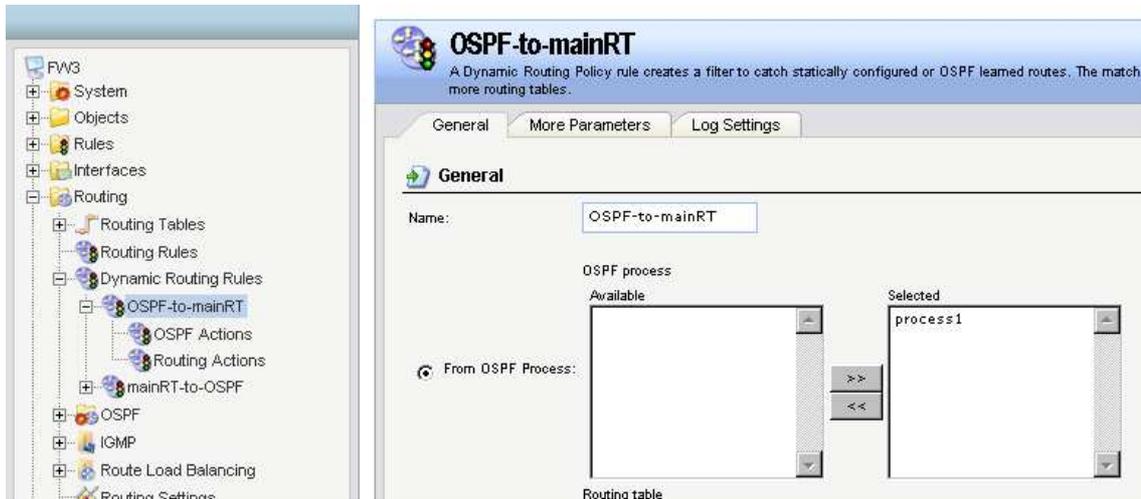
Step3. Create an OSPF area, 0.0.0.2.



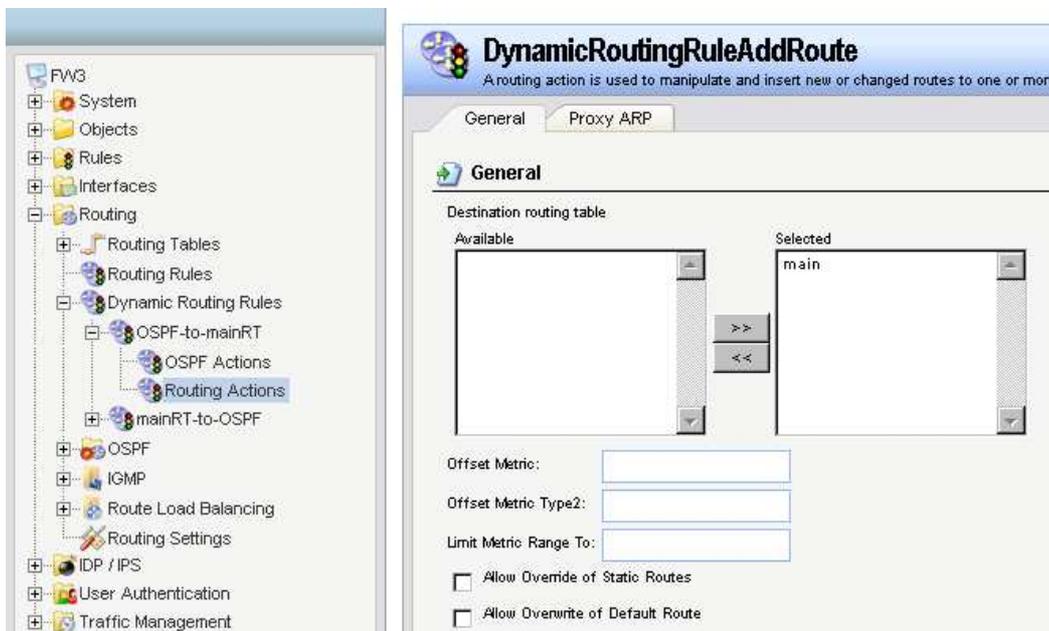
Step4. Add interface wan1 and lan in area 0.0.0.2. Once the interface lan is not added in the area, its route must be used redistribution way to pass to other area. However, it doesn't meet the requirement of this document.



Step5. Create a Dynamic Routing Rules to allow the routes are learnt by OSPF to inject in main routing table



Step6. In the rule created above, add a Routing Actions as the screenshot. Select “main” routing table to be the Destination Routing table.



Step10. Add two IPrules for the PC1 and PC2

IP Rules
IP rules are used to filter IP-based network traffic. In addition, they provide means for address translation as well as Server Load Balancing.

Add ▾

#	Name	Action	Src If	Src Net	Dest If	Dest Net	Service
1	lan-to-wan1	Allow	lan	192.168.105.0/24	wan1	192.168.101.0/24	all_tcpudpicmp
2	wan1-to-lan	Allow	wan1	192.168.101.0/24	lan	192.168.105.0/24	all_tcpudpicmp

SW1:

```
config vlan default delete 1-27
config vlan default add untagged 13-27
config vlan default advertisement enable
create vlan V10 tag 10
config vlan V10 add untagged 1-4 advertisement disable
create vlan V20 tag 20
config vlan V20 add untagged 5-8 advertisement disable
create vlan V30 tag 30
config vlan V30 add untagged 9-12 advertisement disable
```

```
create ipif V10 192.168.100.200/24 V10 state enable
config ipif V10 proxy_arp disable
create ipif V20 192.168.101.200/24 V20 state enable
config ipif V20 proxy_arp disable
create ipif V30 192.168.102.200/24 V30 state enable
config ipif V30 proxy_arp disable
```

```
config ospf ipif System area 0.0.0.0 priority 1 hello_interval 10 dead_interval 40
config ospf ipif System authentication none metric 1 state disable
config ospf ipif V10 area 0.0.0.0 priority 1 hello_interval 10 dead_interval 40
config ospf ipif V10 authentication simple dlink metric 1 state enable
config ospf ipif V20 area 0.0.0.0 priority 1 hello_interval 10 dead_interval 40
config ospf ipif V20 authentication none metric 1 state enable
config ospf ipif V30 area 0.0.0.0 priority 1 hello_interval 10 dead_interval 40
config ospf ipif V30 authentication none metric 1 state enable
config ospf router_id 10.10.10.101
enable ospf
```

Show the routing table on the SW1

```
DGS-3627:admin#show iproute
Command: show iproute

Routing Table

IP Address/Netmask  Gateway          Interface        Cost           Protocol
-----
1.1.1.0/24          192.168.100.201 V10              5              OSPF
2.2.2.0/24          192.168.100.201 V10              25             OSPF
192.168.100.0/24    0.0.0.0          V10              1              Local
192.168.101.0/24    0.0.0.0          V20              1              Local
192.168.103.0/24    192.168.100.201 V10              2              OSPF
192.168.104.0/24    192.168.100.201 V10              6              OSPF
192.168.105.0/24    192.168.100.201 V10              35             OSPF
```

Show the routing table on the FW3

```
FW3:/> routes -all -verbose
```

Flags	Network	Iface	Gateway	Local IP	Metric
	192.168.105.1	core	(Iface IP)		0
	172.17.100.254	core	(Iface IP)		0
	192.168.120.254	core	(Iface IP)		0
	2.2.2.1	core	(Iface IP)		0
	127.0.0.1	core	(Iface IP)		0
O	192.168.104.0/24	wan1	2.2.2.2		11
	Originator: OSPF process "process1"				
O	1.1.1.0/24	wan1	2.2.2.2		14
	Originator: OSPF process "process1"				
O	192.168.103.0/24	wan1	2.2.2.2		15
	Originator: OSPF process "process1"				
O	192.168.100.0/24	wan1	2.2.2.2		18
	Originator: OSPF process "process1"				
O	192.168.101.0/24	wan1	2.2.2.2		19
	Originator: OSPF process "process1"				
	2.2.2.0/24	wan1			100
	192.168.120.0/24	wan2			100
	172.17.100.0/24	dmz			100
	192.168.105.0/24	lan			100
	224.0.0.0/4	core	(Iface IP)		0