

# Injecting Information Dynamically into BGP

## Configuration Command References:

```
admin@XorPlus# set policy policy-statement <Policy-name> term <Term-name> from protocol <bgp/connected/ospf4
/ospf6/rip/static>
```

Note: This command is to specify a policy name and a protocol to be operated.

```
admin@XorPlus# set policy policy-statement <Policy-name> term <Term-name> then <action>
```

Note: This command is to specify an action for the policy-name.

```
admin@XorPlus# set protocols bgp export <Policy-name>
```

Note: This command is to export a special policy which has been defined by the Policy-name.

```
admin@XorPlus# set protocols bgp peer <Peer-IPv6-Address> export <Policy-Name>
```

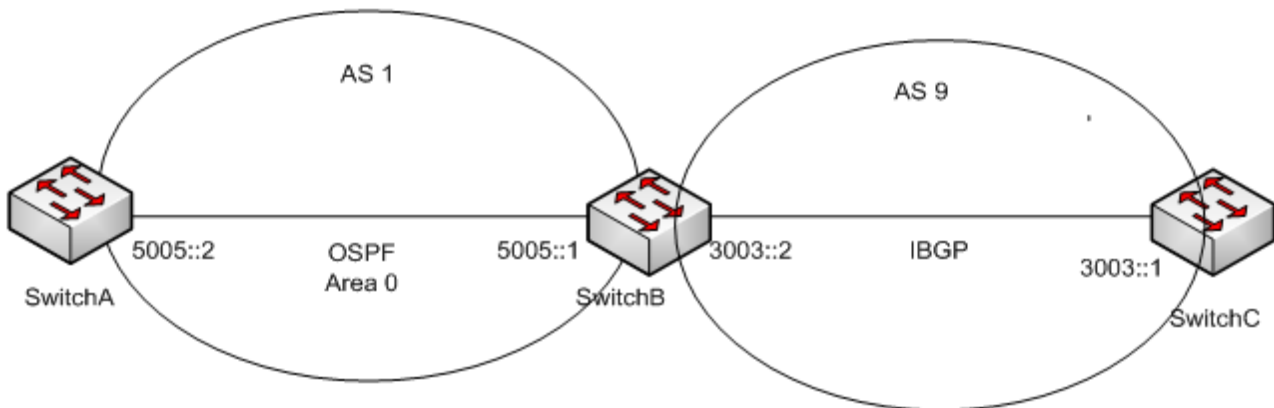
Note: This command is to export the defined policy on a special BGP peer, and the exported BGP route propagates to this special BGP peer.

Inject information dynamically into BGP via route policy, and use export routing policy to inject external route information dynamically into BGP. Reference the section on routing policy for more details about policy.

## Configure Example 1:

The following diagram shows that the policy is applied on the global BGP.

Figure 1-10



### Step 1: Switch A Switch B enable ospfv3

Switch A:

```
admin@XorPlus# set protocols ospf6 instance-id 1
admin@XorPlus# set protocols ospf6 router-id 1.1.1.1
admin@XorPlus# set protocols ospf6 area 0.0.0.0 interface vif vif vif address 5005::2
```

Switch B:

```
admin@XorPlus# set protocols ospf6 instance-id 1
admin@XorPlus# set protocols ospf6 router-id 9.9.9.9
admin@XorPlus# set protocols ospf6 area 0.0.0.0 interface vlan500 vif vlan500 address 5005::1
```

### Step 2: Check ospfv3 neighbor status on Switch B:

Note: OSPFv3 is established.

```
admin@XorPlus# run show ospf6 neighbor
Address                               Interface                               State   Router ID   Pri   Dead
-----                               -
fe80::200:5ff:fe6c:f993              vlan500/vlan500                       Full    1.1.1.1     0     37
```

### Step 3: Switch A propagates two ospfv3 routes to Switch B. Check ospf route table on Switch B

Note: Two ospfv3 route entry, 8888::/64 8888:0:0:1::/64, can be seen:

```
admin@XorPlus# run show route table ipv6 unicast ospf
8888::/64      [ospf(110)/1]
                > to fe80::200:5ff:fe6c:f993 via vlan500/vlan500
8888:0:0:1::/64 [ospf(110)/1]
                > to fe80::200:5ff:fe6c:f993 via vlan500/vlan500
admin@XorPlus# run show route forward-route ipv6 all
Destination                               NetMask                               NextHopMac                               Port
-----                               -
-
3003::                                       ffff:ffff:ffff:ffff::                C8:0A:A9:AE:0A:
66  connected
5005::                                       ffff:ffff:ffff:ffff::                C8:0A:A9:AE:0A:
66  connected
4001::                                       ffff:ffff:ffff:ffff::                04:7D:7B:62:93:FF  te-1/1
/46
2001::                                       ffff:ffff:ffff:ffff::                C8:0A:A9:AE:0A:
66  connected
8888::                                       ffff:ffff:ffff:ffff::                00:00:05:6C:F9:93  te-1/1
/44
8888:0:0:1::                               ffff:ffff:ffff:ffff::                00:00:05:6C:F9:93  te-1/1
/44
```

### Step 4: Switch B Switch C Enable IBGP

Switch B:

```
admin@XorPlus# set protocols bgp bgp-id 9.9.9.9
admin@XorPlus# set protocols bgp local-as "9"
admin@XorPlus# set protocols bgp peer 3003::1 local-ip "3003::2"
admin@XorPlus# set protocols bgp peer 3003::1 as "9"
admin@XorPlus# set protocols bgp peer 3003::1 ipv6-unicast true
admin@XorPlus# set protocols bgp peer 3003::1 next-hop-self true
```

Switch C:

```

admin@XorPlus# set protocols bgp bgp-id 6.6.6.6
admin@XorPlus# set protocols bgp local-as "9"
admin@XorPlus# set protocols bgp peer 3003::2 local-ip "3003::1"
admin@XorPlus# set protocols bgp peer 3003::2 as "9"
admin@XorPlus# set protocols bgp peer 3003::2 ipv6-unicast true
admin@XorPlus# set protocols bgp peer 3003::2 next-hop-self true

```

### Step 5: Check BGP peer status

Switch B:

```

admin@XorPlus# run show bgp peers detail 3003::1
Peer 1: local 3003::2/50235 remote 3003::1/179
  Peer ID: 6.6.6.6
  Peer State: ESTABLISHED
  Admin State: START
  Negotiated BGP Version: 4
  Peer AS Number: 9
  Updates Received: 2, Updates Sent: 0
  Messages Received: 6, Messages Sent: 4
  Time since last received update: 63 seconds
  Number of transitions to ESTABLISHED: 3
  Time since last entering ESTABLISHED state: 63 seconds
  Retry Interval: 120 seconds
  Hold Time: 90 seconds, Keep Alive Time: 30 seconds
  Configured Hold Time: 90 seconds, Configured Keep Alive Time: 30 seconds
  Minimum AS Origination Interval: 0 seconds
  Minimum Route Advertisement Interval: 0 seconds

```

Switch C:

```

admin@XorPlus# run show bgp peers detail 3003::2
Peer 1: local 3003::1/179 remote 3003::2/50235
  Peer ID: 9.9.9.9
  Peer State: ESTABLISHED
  Admin State: START
  Negotiated BGP Version: 4
  Peer AS Number: 9
  Updates Received: 0, Updates Sent: 2
  Messages Received: 6, Messages Sent: 9
  Time since last received update: n/a
  Number of transitions to ESTABLISHED: 4
  Time since last entering ESTABLISHED state: 109 seconds
  Retry Interval: 120 seconds
  Hold Time: 90 seconds, Keep Alive Time: 30 seconds
  Configured Hold Time: 90 seconds, Configured Keep Alive Time: 30 seconds
  Minimum AS Origination Interval: 0 seconds
  Minimum Route Advertisement Interval: 0 seconds

```

### Step 6: Check BGP route table on Switch B. The BGP route table should be NULL.

```

admin@XorPlus# run show bgp routes ipv6
Status Codes: * valid route, > best route
Origin Codes: i IGP, e EGP, ? incomplete

```

Prefix	Nexthop	Peer	AS Path
-----	-----	-----	-----
admin@XorPlus#			

### Step 7: Configure a policy to Inject ospfv3 route entry into IPV6 BGP on SwitchB

Switch B:

```
admin@XorPlus# set policy policy-statement ospfintobgp term 1 from protocol ospf6
admin@XorPlus# set policy policy-statement ospfintobgp term 1 then accept
```

### Step 8: Apply the policy Step 6 defined to BGP

Note: The ospfv3 route entry will inject into BGP route table after applying the policy on BGP

Switch B:

```
admin@XorPlus# set protocols bgp export ospfintobgp
admin@XorPlus# commit
Merging the configuration.
Commit OK.
Save done.
admin@XorPlus# run show bgp routes ipv6
Status Codes: * valid route, > best route
Origin Codes: i IGP, e EGP, ? incomplete
```

Prefix	Nexthop	Peer	AS Path
*> 8888::/64	fe80::200:5ff:fe6c:f993	0.0.0.0	?
*> 8888:0:0:1::/64	fe80::200:5ff:fe6c:f993	0.0.0.0	?

Switch C:

```
admin@XorPlus# run show bgp routes ipv6
Status Codes: * valid route, > best route
Origin Codes: i IGP, e EGP, ? incomplete
```

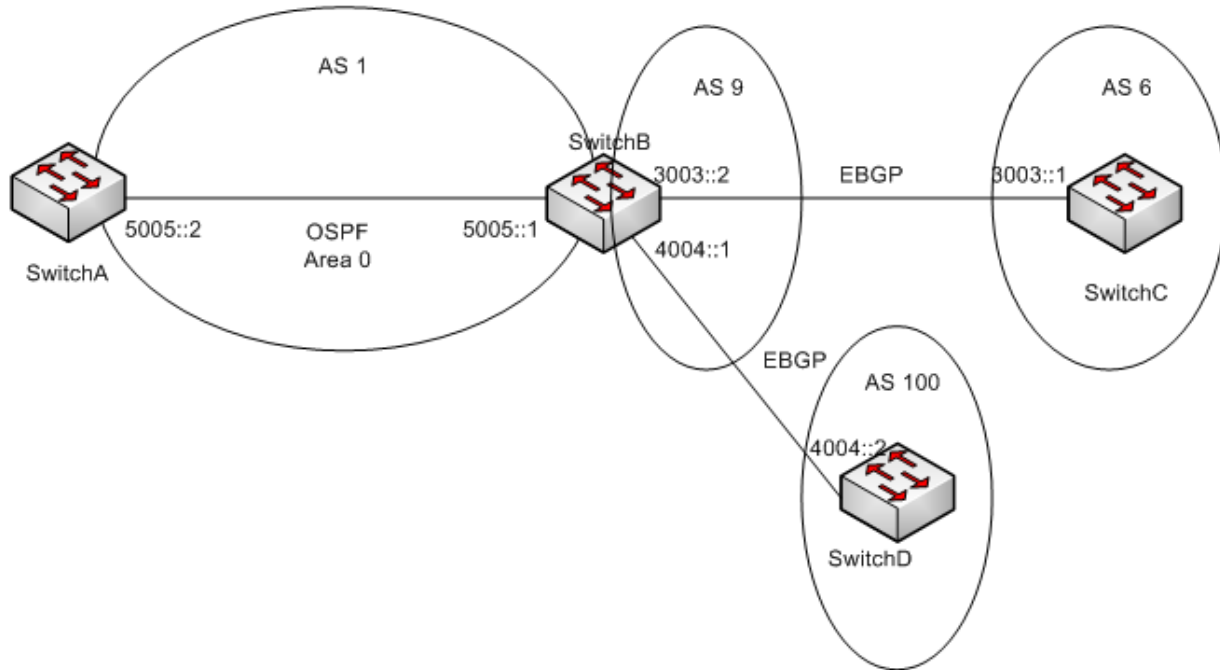
Prefix	Nexthop	Peer	AS Path
*> 8888::/64	3003::2	9.9.9.9	?
*> 8888:0:0:1::/64	3003::2	9.9.9.9	?

```
admin@XorPlus#
```

## Configure Example 2:

The following example shows that, with the policy applied on the special peer, BGP route entry will only propagate to this special BGP peer and not to others.

Figure 1-11



**Step 1: Switch A Switch B enable ospfv3**

Switch A:

```
admin@XorPlus#set protocols ospf6 instance-id 1
admin@XorPlus#set protocols ospf6 router-id 1.1.1.1
admin@XorPlus#set protocols ospf6 area 0.0.0.0 interface vlan500 vif vlan500 address 5005::2
```

Switch B:

```
admin@XorPlus#set protocols ospf6 instance-id 1
admin@XorPlus#set protocols ospf6 router-id 9.9.9.9
admin@XorPlus#set protocols ospf6 area 0.0.0.0 interface vlan500 vif vlan500 address 5005::1
```

**Step 2: Check ospfv3 neighbor status on Switch B:**

Note: OSPFv3 is established.

```
admin@XorPlus# run show ospf6 neighbor
Address                               Interface           State      Router ID         Pri    Dead
-----                               -
fe80::200:5ff:fe6c:f993              vlan500/vlan500   Full      1.1.1.1          0     37
```

**Step 3: Switch A propagates two ospfv3 routes to Switch B. Then, check ospf route table on Switch B**

Note: Two ospfv3 route entry, 8888::/64 8888:0:0:1::/64, can be seen.

```

admin@XorPlus# run show route table ipv6 unicast ospf
8888::/64      [ospf(110)/1]
                > to fe80::200:5ff:fe6c:f993 via vlan500/vlan500
8888:0:0:1::/64 [ospf(110)/1]
                > to fe80::200:5ff:fe6c:f993 via vlan500/vlan500

```

```

admin@XorPlus# run show route forward-route ipv6 all
Destination                                     NetMask                                     NextHopMac                                     Port
-----
-
3003::                                           ffff:ffff:ffff:ffff::                   C8:0A:A9:AE:0A:
66  connected
5005::                                           ffff:ffff:ffff:ffff::                   C8:0A:A9:AE:0A:
66  connected
4001::                                           ffff:ffff:ffff:ffff::                   04:7D:7B:62:93:FF  te-1/1
/46
2001::                                           ffff:ffff:ffff:ffff::                   C8:0A:A9:AE:0A:
66  connected
8888::                                           ffff:ffff:ffff:ffff::                   00:00:05:6C:F9:93  te-1/1
/44
8888:0:0:1::                                     ffff:ffff:ffff:ffff::                   00:00:05:6C:F9:93  te-1/1
/44

```

**Step 4: Switch B Switch C Enable EBGP. Switch B Switch D Enable EBGP.**

Switch B:

```

admin@XorPlus#set protocols bgp bgp-id 9.9.9.9
admin@XorPlus#set protocols bgp local-as "9"
admin@XorPlus#set protocols bgp peer 3003::1 local-ip "3003::2"
admin@XorPlus#set protocols bgp peer 3003::1 as "6"
admin@XorPlus#set protocols bgp peer 3003::1 ipv6-unicast true
admin@XorPlus#set protocols bgp peer 4004::2 local-ip "4004::1"
admin@XorPlus#set protocols bgp peer 4004::2 as "100"
admin@XorPlus#set protocols bgp peer 4004::2 ipv6-unicast true

```

Switch C:

```

admin@XorPlus#set protocols bgp bgp-id 6.6.6.6
admin@XorPlus#set protocols bgp local-as "6"
admin@XorPlus#set protocols bgp peer 3003::2 local-ip "3003::1"
admin@XorPlus#set protocols bgp peer 3003::2 as "9"
admin@XorPlus#set protocols bgp peer 3003::2 ipv6-unicast true

```

Switch D:

```

admin@XorPlus#set protocols bgp bgp-id 100.100.100.100
admin@XorPlus#set protocols bgp local-as 100
admin@XorPlus#set protocols bgp peer 4004::1 local-ip "4004::2"
admin@XorPlus#set protocols bgp peer 4004::1 as 9
admin@XorPlus#set protocols bgp peer 4004::1 ipv6-unicast true

```

**Step 5: Check BGP peer status on Switch B**

Note: BGP peer all established can be seen.

Switch B:

```

admin@XorPlus# run show bgp peers detail 3003::1
Peer 1: local 3003::2/179 remote 3003::1/41512
  Peer ID: 6.6.6.6
  Peer State: ESTABLISHED
  Admin State: START
  Negotiated BGP Version: 4
  Peer AS Number: 6
  Updates Received: 0, Updates Sent: 5
  Messages Received: 56, Messages Sent: 62
  Time since last received update: n/a
  Number of transitions to ESTABLISHED: 5
  Time since last entering ESTABLISHED state: 1426 seconds
  Retry Interval: 120 seconds
  Hold Time: 90 seconds, Keep Alive Time: 30 seconds
  Configured Hold Time: 90 seconds, Configured Keep Alive Time: 30 seconds
  Minimum AS Origination Interval: 0 seconds
  Minimum Route Advertisement Interval: 0 seconds
admin@XorPlus# run show bgp peers detail 4004::2
Peer 1: local 4004::1/34116 remote 4004::2/179
  Peer ID: 100.100.100.100
  Peer State: ESTABLISHED
  Admin State: START
  Negotiated BGP Version: 4
  Peer AS Number: 100
  Updates Received: 1, Updates Sent: 0
  Messages Received: 8, Messages Sent: 7
  Time since last received update: 120 seconds
  Number of transitions to ESTABLISHED: 2
  Time since last entering ESTABLISHED state: 144 seconds
  Retry Interval: 120 seconds
  Hold Time: 90 seconds, Keep Alive Time: 30 seconds
  Configured Hold Time: 90 seconds, Configured Keep Alive Time: 30 seconds
  Minimum AS Origination Interval: 0 seconds
  Minimum Route Advertisement Interval: 0 seconds
admin@XorPlus#

```

**Step 6: Check BGP route table on Switch B Switch C Switch D. They should all be NULL.**

Switch B:

```

admin@XorPlus# run show bgp routes ipv6
Status Codes: * valid route, > best route
Origin Codes: i IGP, e EGP, ? incomplete

```

Prefix	Nextthop	Peer	AS Path
-----	-----	-----	-----

Switch C:

```

admin@XorPlus# run show bgp routes ipv6
Status Codes: * valid route, > best route
Origin Codes: i IGP, e EGP, ? incomplete

```

Prefix	Nextthop	Peer	AS Path
-----	-----	-----	-----

Switch D:

```
admin@XorPlus# run show bgp routes ipv6
Status Codes: * valid route, > best route
Origin Codes: i IGP, e EGP, ? incomplete
```

Prefix	Nexthop	Peer	AS Path
-----	-----	-----	-----

### Step 7: Configure a policy to Inject ospfv3 route entry into IPV6 BGP on Switch B

Switch B:

```
admin@XorPlus# set policy policy-statement ospfintobgp term 1 from protocol ospf6
admin@XorPlus# set policy policy-statement ospfintobgp term 1 then accept
```

### Step 8: Apply the policy on the special BGP peer

Note: BGP route will only propagate to the special BGP peer, not to other peers. If the policy is applied on peer 3003::1, the BGP route will propagate to Switch C but will not propagate to peer 4004::2 on Switch D. Thus, BGP route entry on Switch C can be seen, but the BGP route table on Switch D is still NULL.

Switch B:

```
admin@XorPlus# set protocols bgp peer 3003::1 export ospfintobgp
admin@XorPlus# commit
Merging the configuration.
Commit OK.
Save done.
admin@XorPlus# run show bgp routes ipv6
Status Codes: * valid route, > best route
Origin Codes: i IGP, e EGP, ? incomplete
```

Prefix	Nexthop	Peer	AS Path
-----	-----	-----	-----
*> 8888::/64	fe80::200:5ff:fe6c:f993	0.0.0.0	?
*> 8888:0:0:1::/64	fe80::200:5ff:fe6c:f993	0.0.0.0	?

```
admin@XorPlus#
```

Switch C:

```
admin@XorPlus# run show bgp routes ipv6
Status Codes: * valid route, > best route
Origin Codes: i IGP, e EGP, ? incomplete
```

Prefix	Nexthop	Peer	AS Path
-----	-----	-----	-----
*> 8888::/64	3003::2	9.9.9.9	9 ?
*> 8888:0:0:1::/64	3003::2	9.9.9.9	9 ?

**Note: The BGP route table just propagates to peer 3003::1, so the BGP route entry from peer 3003::2 can be seen.**

Switch D:



```
admin@XorPlus# run show bgp routes ipv6
Status Codes: * valid route, > best route
Origin Codes: i IGP, e EGP, ? incomplete
```

Prefix	Nexthop	Peer	AS Path
-----	-----	-----	-----

```
admin@XorPlus#
```

Note: The BGP route entry did not propagate to peer 4004::2, so the bgp route table is null on Switch D.