

# Example for Configuring Basic BGP Functions

- Network Requirement
- Procedure
  - Switch A
  - Switch B
  - Switch C
  - Switch D
  - Viewing BGP Peer Status on Switch B
  - Configuring Switch A to Advertise Route 192.168.10.0/24
  - Configuring Switch B to Advertise a Connected Route

## Network Requirement

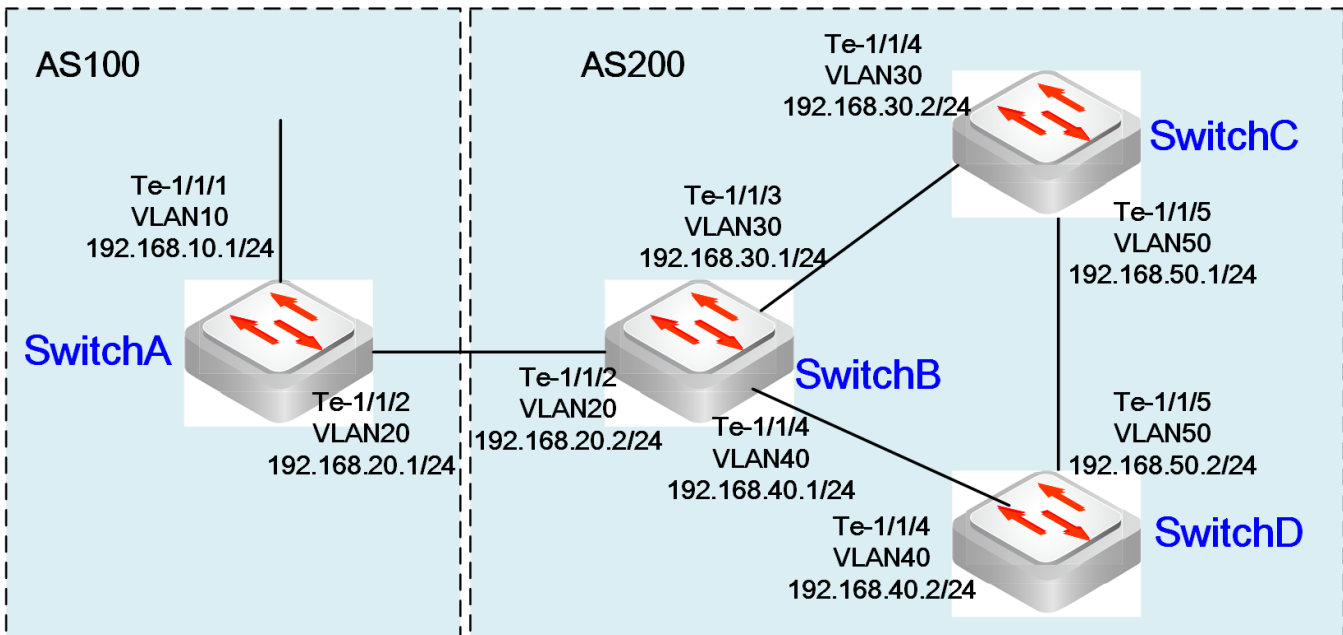
As shown in Figure. 1, BGP runs on all the switches.

An EBGP connection is established between Switch A and Switch B, and IBGP fullmesh connections are established between Switch B, Switch C, and Switch D.

Configure IBGP connections between Switch B, Switch C, and Switch D.

Configure an EBGP connection between Switch A and Switch B.

Figure 1. BGP configuration



## Procedure

This section describes the steps of how to configure basic BGP functions on SwitchA, SwitchB, SwitchC and SwitchD.

### Switch A

**Step1** Configure the VLANs and VLAN interfaces.

```
admin@SwitchA# set vlans vlan-id 10 l3-interface 10
admin@SwitchA# set vlans vlan-id 20 l3-interface 20
admin@SwitchA# set interface gigabit-ethernet te-1/1/1 family ethernet-switching native-vlan-id 10
admin@SwitchA# set interface gigabit-ethernet te-1/1/2 family ethernet-switching native-vlan-id 20
admin@SwitchA# set l3-interface vlan-interface 10 address 192.168.10.1 prefix-length 24
admin@SwitchA# set l3-interface vlan-interface 20 address 192.168.20.1 prefix-length 24
```

**Step2** Configure an EBGp connection.

```
admin@SwitchA# set protocols bgp router-id 1.1.1.1
admin@SwitchA# set protocols bgp local-as 100
admin@SwitchA# set protocols bgp neighbor 192.168.20.2 remote-as 200
```

**Step3** Enable IP routing.

```
admin@SwitchA# set ip routing enable true
```

**Step4** Commit the configurations.

```
admin@SwitchA# commit
```

## Switch B

**Step1** Configure the VLANs and VLAN interfaces.

```
admin@SwitchB# set vlans vlan-id 20 l3-interface 20
admin@SwitchB# set vlans vlan-id 30 l3-interface 30
admin@SwitchB# set vlans vlan-id 40 l3-interface 40
admin@SwitchB# set interface gigabit-ethernet te-1/1/2 family ethernet-switching native-vlan-id 20
admin@SwitchB# set interface gigabit-ethernet te-1/1/3 family ethernet-switching native-vlan-id 30
admin@SwitchB# set interface gigabit-ethernet te-1/1/4 family ethernet-switching native-vlan-id 40
admin@SwitchB# set l3-interface vlan-interface 20 address 192.168.20.2 prefix-length 24
admin@SwitchB# set l3-interface vlan-interface 30 address 192.168.30.1 prefix-length 24
admin@SwitchB# set l3-interface vlan-interface 40 address 192.168.40.1 prefix-length 24
```

**Step2** Configure EBGp and IBGp connections.

```
admin@SwitchB# set protocols bgp router-id 2.2.2.2
admin@SwitchB# set protocols bgp local-as 200
admin@SwitchB# set protocols bgp neighbor 192.168.20.1 remote-as 100
admin@SwitchB# set protocols bgp neighbor 192.168.30.2 remote-as 200
admin@SwitchB# set protocols bgp neighbor 192.168.40.2 remote-as 200
```

**Step3** Enable IP routing.

```
admin@SwitchB# set ip routing enable true
```

**Step4** Commit the configurations.

```
admin@SwitchB# commit
```

## Switch C

**Step1** Configure the VLANs and VLAN interfaces.

```
admin@SwitchC# set vlans vlan-id 40 l3-interface 40
admin@SwitchC# set vlans vlan-id 50 l3-interface 50
admin@SwitchC# set interface gigabit-ethernet te-1/1/4 family ethernet-switching native-vlan-id 40
admin@SwitchC# set interface gigabit-ethernet te-1/1/5 family ethernet-switching native-vlan-id 50
admin@SwitchC# set l3-interface vlan-interface 40 address 192.168.30.2 prefix-length 24
admin@SwitchC# set l3-interface vlan-interface 50 address 192.168.50.1 prefix-length 24
```

**Step2** Configure the IBGp connection.

```
admin@SwitchC# set protocols bgp router-id 3.3.3.3
admin@SwitchC# set protocols bgp local-as 200
admin@SwitchC# set protocols bgp neighbor 192.168.30.1 remote-as 200
admin@SwitchC# set protocols bgp neighbor 192.168.50.2 remote-as 200
```

**Step3** Enable IP routing.

```
admin@SwitchC# set ip routing enable true
```

**Step4** Commit the configurations.

```
admin@SwitchC# commit
```

## Switch D

**Step1** Configure the VLANs and VLAN interfaces.

```
admin@SwitchD# set vlans vlan-id 30 l3-interface 30
admin@SwitchD# set vlans vlan-id 50 l3-interface 50
admin@SwitchD# set interface gigabit-ethernet te-1/1/3 family ethernet-switching native-vlan-id 30
admin@SwitchD# set interface gigabit-ethernet te-1/1/5 family ethernet-switching native-vlan-id 50
admin@SwitchD# set l3-interface vlan-interface 40 address 192.168.40.2 prefix-length 24
admin@SwitchD# set l3-interface vlan-interface 50 address 192.168.50.2 prefix-length 24
```

**Step2** Configure the IBGP connection.

```
admin@SwitchD# set protocols bgp router-id 4.4.4.4
admin@SwitchD# set protocols bgp local-as 200
admin@SwitchD# set protocols bgp neighbor 192.168.40.1 remote-as 200
admin@SwitchD# set protocols bgp neighbor 192.168.50.1 remote-as 200
```

**Step3** Enable IP routing.

```
admin@SwitchD# set ip routing enable true
```

**Step4** Commit the configurations.

```
admin@SwitchD# commit
```

## Viewing BGP Peer Status on Switch B

```
admin@SwitchB# run show bgp neighbor
BGP neighbor on vlan20: 192.168.20.1, remote AS 100, local AS 200, external link
  BGP version 4, remote router ID 1.1.1.1, local router ID 2.2.2.2
  BGP state = Idle
  Last read 00:15:06, Last write never
  Hold time is 180, keepalive interval is 60 seconds
  Graceful restart information:
    Local GR Mode: Helper*
    Remote GR Mode: NotApplicable
  R bit: False
  Timers:
    Configured Restart Time(sec): 120
    Received Restart Time(sec): 0
  Message statistics:
    Inq depth is 0
    Outq depth is 0
    Sent          Rcvd
```

```
Opens:                0          0
Notifications:       0          0
Updates:             0          0
Keepalives:          0          0
Route Refresh:       0          0
Capability:           0          0
Total:                0          0
```

Minimum time between advertisement runs is 0 seconds

For address family: IPv4 Unicast  
Not part of any update group  
Community attribute sent to this neighbor(all)  
0 accepted prefixes

Connections established 0; dropped 0  
Last reset 00:15:06, Waiting for Peer IPv6 LLA  
BGP Connect Retry Timer in Seconds: 120  
Read thread: off Write thread: off FD used: -1

BGP neighbor is 192.168.30.2, remote AS 200, local AS 200, internal link  
Administratively shut down

BGP version 4, remote router ID 3.3.3.3, local router ID 2.2.2.2  
BGP state = Idle

Last read 00:15:06, Last write never  
Hold time is 180, keepalive interval is 60 seconds

Graceful restart information:

Local GR Mode: Helper\*  
Remote GR Mode: NotApplicable  
R bit: False

Timers:  
Configured Restart Time(sec): 120  
Received Restart Time(sec): 0

Message statistics:

Inq depth is 0  
Outq depth is 0

	Sent	Rcvd
Opens:	0	0
Notifications:	0	0
Updates:	0	0
Keepalives:	0	0
Route Refresh:	0	0
Capability:	0	0
Total:	0	0

Minimum time between advertisement runs is 600 seconds

For address family: IPv4 Unicast  
Not part of any update group  
Advertise bestpath per AS via addpath  
Override ASNs in outbound updates if aspath equals remote-as  
Community attribute sent to this neighbor(all)  
0 accepted prefixes

Connections established 0; dropped 0  
Last reset 00:15:06, No AFI/SAFI activated for peer  
External BGP neighbor may be up to 255 hops away.  
BGP Connect Retry Timer in Seconds: 111  
Peer Authentication Enabled  
Read thread: off Write thread: off FD used: -1

BGP neighbor is 192.168.40.2, remote AS 200, local AS 200, internal link  
BGP version 4, remote router ID 4.4.4.4, local router ID 2.2.2.2

BGP state = Active  
Last read 00:15:06, Last write never  
Hold time is 180, keepalive interval is 60 seconds

Graceful restart information:

Local GR Mode: Helper\*  
Remote GR Mode: NotApplicable  
R bit: False

Timers:  
Configured Restart Time(sec): 120  
Received Restart Time(sec): 0

```

Message statistics:
  Inq depth is 0
  Outq depth is 0

          Sent      Rcvd
Opens:           0          0
Notifications:  0          0
Updates:         0          0
Keepalives:      0          0
Route Refresh:   0          0
Capability:       0          0
Total:           0          0
Minimum time between advertisement runs is 0 seconds

```

```

For address family: IPv4 Unicast
Not part of any update group
Advertise bestpath per AS via addpath
Override ASNs in outbound updates if aspath equals remote-as
Community attribute sent to this neighbor(all)
0 accepted prefixes

Connections established 0; dropped 0
Last reset 00:15:06, No AFI/SAFI activated for peer
External BGP neighbor may be up to 255 hops away.
BGP Connect Retry Timer in Seconds: 111
Peer Authentication Enabled
Read thread: off Write thread: off FD used: -1

```

## Configuring Switch A to Advertise Route 192.168.10.0/24

```

admin@SwitchA# set protocols bgp ipv4-unicast network 192.168.10.0/24
admin@SwitchA# commit

```

### View the BGP routing table of Switch B:

```

admin@SwitchB# run show bgp
show bgp ipv4 unicast
=====
BGP table version is 2, local router ID is 4.4.4.4, vrf id 0
Default local pref 100, local AS 200
Status codes: s suppressed, d damped, h history, * valid, > best, = multipath,
               i internal, r RIB-failure, S Stale, R Removed
Nexthop codes: @NNN nexthop's vrf id, < announce-nh-self
Origin codes:  i - IGP, e - EGP, ? - incomplete

   Network          Next Hop          Metric LocPrf Weight Path
*> 192.168.10.0/24
      192.168.20.1          0              100 32768 i

Displayed 1 routes and 1 total paths

show bgp ipv6 unicast
=====
No BGP prefixes displayed, 0 exist

```

### View the BGP routing table of Switch C:

```

admin@SwitchC# run show bgp
show bgp ipv4 unicast
=====
BGP table version is 2, local router ID is 3.3.3.3, vrf id 0
Default local pref 100, local AS 200
Status codes:  s suppressed, d damped, h history, * valid, > best, = multipath,
                i internal, r RIB-failure, S Stale, R Removed
Nexthop codes: @NNN nexthop's vrf id, < announce-nh-self
Origin codes:  i - IGP, e - EGP, ? - incomplete

   Network          Next Hop          Metric LocPrf Weight Path
*> 192.168.10.0/24
                192.168.20.1          0          100 32768 i

Displayed 1 routes and 1 total paths

show bgp ipv6 unicast
=====
No BGP prefixes displayed, 0 exist

```

The preceding command output display that the route to destination 192.168.10.0/24 becomes invalid because the next hop address of this route is unreachable.

## Configuring Switch B to Advertise a Connected Route

```

admin@SwitchB# set protocols bgp ipv4-unicast redistribute connected
admin@SwitchB# commit

```

### Ping 192.168.10.1 on Switch C:

```

admin@SwitchC# run ping 192.168.10.1
PING 192.168.10.1 (192.168.10.1) 56(84) bytes of data.
64 bytes from 192.168.10.1: icmp_req=1 ttl=63 time=4.68 ms
64 bytes from 192.168.10.1: icmp_req=2 ttl=63 time=4.46 ms
64 bytes from 192.168.10.1: icmp_req=3 ttl=63 time=5.35 ms
64 bytes from 192.168.10.1: icmp_req=4 ttl=63 time=4.52 ms
64 bytes from 192.168.10.1: icmp_req=5 ttl=63 time=4.51 ms
192.168.10.1 ping statistics -
5 packets transmitted, 5 received, 0% packet loss, time 4017ms
rtt min/avg/max/mdev = 4.460/4.709/5.358/0.338 ms

```

### View the BGP routing table of Switch C:

```

admin@SwitchC# run show bgp
show bgp ipv4 unicast
=====
BGP table version is 2, local router ID is 3.3.3.3, vrf id 0
Default local pref 100, local AS 200
Status codes:  s suppressed, d damped, h history, * valid, > best, = multipath,
                i internal, r RIB-failure, S Stale, R Removed
Nexthop codes: @NNN nexthop's vrf id, < announce-nh-self
Origin codes:  i - IGP, e - EGP, ? - incomplete

   Network          Next Hop           Metric LocPrf Weight Path
*> 192.168.10.0/24
      192.168.20.1             0             100 32768 i
*> 192.168.40.0/24
      192.168.30.1             0             100 32768 i
      192.168.30.0/24
      192.168.30.1             0             100 32768 i
*> 192.168.10.0/24
      192.168.30.1             0             100 32768 i

Displayed 4 routes and 4 total paths

show bgp ipv6 unicast
=====
No BGP prefixes displayed, 0 exist

```