

# Example for Configuring BGP Load Balancing

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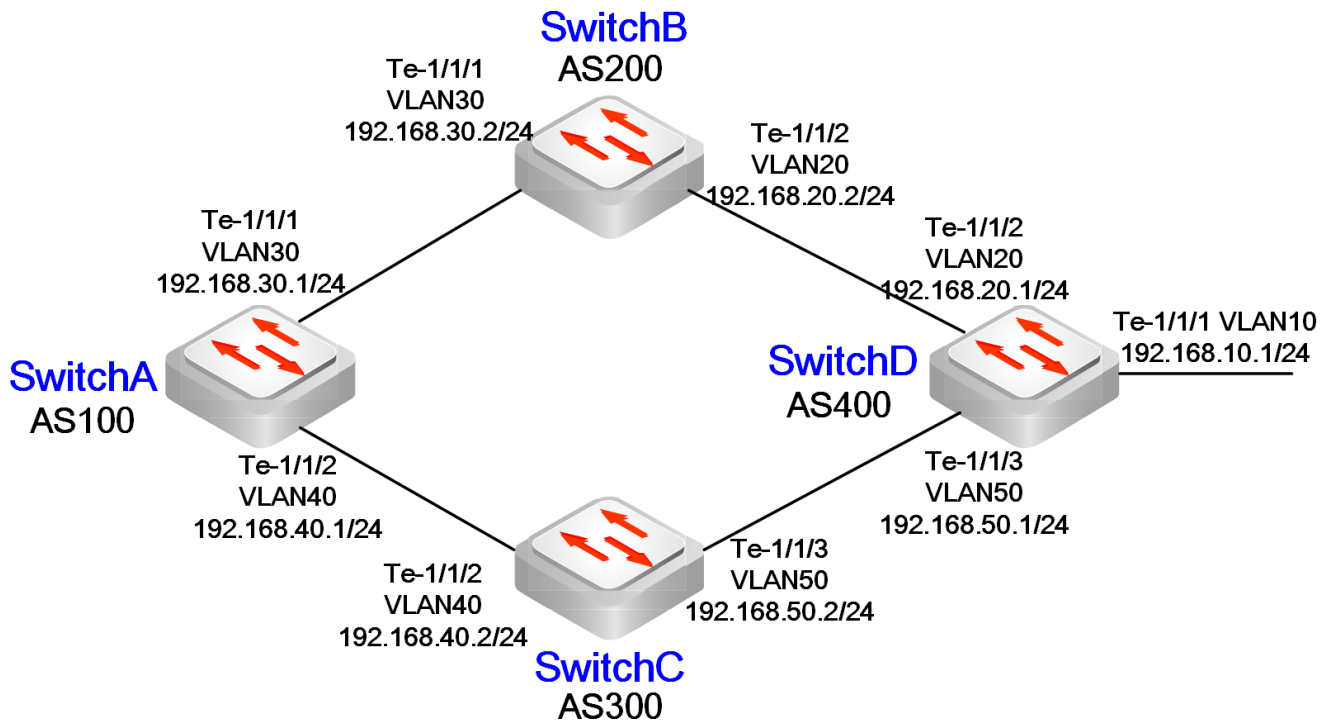
## Network Requirement

Configure load balancing on Switch A.

Configure EBGP connections between Switch B and Switch A and between Switch B and Switch D.

Configure EBGP connections between Switch C and Switch A and between Switch C and Switch D.

Figure 1. BGP Load Balancing



## 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 30 l3-interface vlan30
admin@SwitchA# set vlans vlan-id 40 l3-interface vlan40
admin@SwitchA# set interface gigabit-ethernet te-1/1/1 family ethernet-switching native-vlan-id 30
admin@SwitchA# set interface gigabit-ethernet te-1/1/2 family ethernet-switching native-vlan-id 40
admin@SwitchA# set l3-interface vlan-interface vlan30 address 192.168.30.1 prefix-length 24
admin@SwitchA# set l3-interface vlan-interface vlan40 address 192.168.40.1 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 192.168.30.2 remote-as 200
admin@SwitchA# set protocols bgp neighbor 192.168.40.2 remote-as 300
```

**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 vlan20
admin@SwitchB# set vlans vlan-id 30 l3-interface vlan30
admin@SwitchB# set interface gigabit-ethernet te-1/1/1 family ethernet-switching native-vlan-id 30
admin@SwitchB# set interface gigabit-ethernet te-1/1/2 family ethernet-switching native-vlan-id 20
admin@SwitchB# set l3-interface vlan-interface vlan20 address 192.168.20.2 prefix-length 24
admin@SwitchB# set l3-interface vlan-interface vlan30 address 192.168.30.2 prefix-length 24
```

**Step2** Configure EBGp 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 192.168.30.1 remote-as 100
admin@SwitchB# set protocols bgp neighbor 192.168.20.1 remote-as 400
```

**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-1/1/2 family ethernet-switching native-vlan-id 40
admin@SwitchC# set interface gigabit-ethernet te-1/1/3 family ethernet-switching native-vlan-id 50
admin@SwitchC# set l3-interface vlan-interface vlan40 address 192.168.40.2 prefix-length 24
admin@SwitchC# set l3-interface vlan-interface vlan50 address 192.168.50.2 prefix-length 24
```

**Step2** Configure the EBGP connection.

```
admin@SwitchC# set protocols bgp router-id 3.3.3.3
admin@SwitchC# set protocols bgp local-as 300
admin@SwitchC# set protocols bgp neighbor 192.168.40.1 remote-as 100
admin@SwitchC# set protocols bgp neighbor 192.168.50.1 remote-as 400
```

**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 10 l3-interface vlan10
admin@SwitchD# set vlans vlan-id 20 l3-interface vlan20
admin@SwitchD# set vlans vlan-id 50 l3-interface vlan50
admin@SwitchD# set interface gigabit-ethernet te-1/1/1 family ethernet-switching native-vlan-id 10
admin@SwitchD# set interface gigabit-ethernet te-1/1/2 family ethernet-switching native-vlan-id 20
admin@SwitchD# set interface gigabit-ethernet te-1/1/3 family ethernet-switching native-vlan-id 50
admin@SwitchD# set l3-interface vlan-interface vlan10 address 192.168.10.1 prefix-length 24
admin@SwitchD# set l3-interface vlan-interface vlan20 address 192.168.20.1 prefix-length 24
admin@SwitchD# set l3-interface vlan-interface vlan50 address 192.168.50.1 prefix-length 24
```

**Step2** Configure the EBGP connection.

```
admin@SwitchD# set protocols bgp router-id 4.4.4.4
admin@SwitchD# set protocols bgp local-as 400
admin@SwitchD# set protocols bgp neighbor 192.168.20.2 remote-as 200
admin@SwitchD# set protocols bgp neighbor 192.168.50.2 remote-as 300
```

**Step3** Enable IP routing.

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

**Step4** Commit the configurations.

```
admin@SwitchD# commit
```

## Viewing BGP Peer Status on Switch B and Switch C

```
admin@SwitchB# run show bgp neighbor
BGP neighbor on vlan30: 192.168.30.1, 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 192.168.20.2, remote AS 400, 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 D to Advertise Route 192.168.10.0/24

```

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

```

## Configure Switch A to Enable BGP Load Balancing

Because Switch A has two routes to reach AS 400, configuring load balancing over the two BGP routes on Switch A can improve link usage.

```

admin@SwitchA# set protocols bgp ipv4-unicast multipath ibgp maximum-paths 2
admin@SwitchA# commit

```

Then you can view the BGP routing table to 192.168.10.0/24 on Switch A, you can find that:

- The route 192.168.10.0/24 has two next hops, 192.168.30.2 and 192.168.40.2, both of which are marked with a greater-than sign (>), indicating that they are the optimal routes.
- By using the **run show bgp route 192.168.10.0/24** command, you can find two routes to 192.168.10.0/24. One has next hop 192.168.30.2 and output interface VLAN interface vlan30, and the other has next hop 192.168.40.2 and output interface VLAN interface vlan40.

