

## OSPF Metric With Route Map

<b>Purpose</b>	<b>Manipulate metric of routes which will send in to OSPF using route map.</b>
<b>Test setup</b>	<p>The diagram illustrates a network topology with three routers: R1, R2, and R3. R1 is connected to R2 via BGP on interface G0/1 (192.168.2.1/24). R2 is connected to R3 via OSPF Area 0 on interface G0/2 (192.168.1.1/24). R1 has loopbacks 0 (1.1.1.1), 30 (30.1.1.1), 50 (50.1.1.1), and 60 (60.1.1.1). R2 has loopbacks 10 (10.10.10.10) and 20 (20.20.20.20). R3 has loopback 5 (5.5.5.5).</p>
<b>Test configuration</b>	<pre> <b>Router 1</b> ! interface Loopback0 ip address 1.1.1.1 255.255.255.255 no ip directed-broadcast ! interface Loopback30 ip address 30.1.1.1 255.255.255.255 no ip directed-broadcast ! interface Loopback50 ip address 50.1.1.1 255.255.255.255 no ip directed-broadcast ! interface Loopback60 ip address 60.1.1.1 255.255.255.255 no ip directed-broadcast ! interface GigaEthernet0/1 ip address 192.168.2.1 255.255.255.0 no ip directed-broadcast ip http firewalltype 0 ! router bgp 64000 no synchronization bgp log-neighbor-changes network 1.1.1.1/32 network 30.1.1.1/32 network 50.1.1.1/32 network 60.1.1.1/32 neighbor 192.168.2.10 remote-as 65000 !  <b>Router 2</b> ! interface Loopback0 ip address 10.10.10.10 255.255.255.255 </pre>

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no ip directed-broadcast
!
interface Loopback20
ip address 20.20.20.20 255.255.255.255
no ip directed-broadcast
!
interface Loopback100
ip address 100.1.1.1 255.255.255.255
no ip directed-broadcast
!
interface GigaEthernet0/1
ip address 192.168.2.10 255.255.255.0
no ip directed-broadcast
ipv6 enable
ipv6 dhcp client na
ip http firewalltype 0
!
interface GigaEthernet0/2
ip address 192.168.1.1 255.255.255.0
no ip directed-broadcast
ip http firewalltype 0
!
ip access-list standard 1
permit 1.1.1.1 255.255.255.255 sequence 10
!
ip access-list standard 30
permit 30.1.1.1 255.255.255.255 sequence 10
!
ip access-list standard 50
permit 50.1.1.1 255.255.255.255 sequence 10
!
!
route-map bgpTOospf 10 permit
match ip address 1
set metric-type type-1
set metric 80
!
route-map bgpTOospf 20 permit
match ip address 30
set metric-type type-1
!
route-map bgpTOospf 30 deny
match ip address 50
!
route-map bgpTOospf 40 permit
!
route-map 30 10 deny
match ip address 50
!
route-map 40 10 permit
!
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	<pre> ! router ospf 1  network 100.1.1.1 255.255.255.255 area 0  network 192.168.1.0 255.255.255.0 area 0  redistribute bgp 65000 route-map bgpTOospf ! ! router bgp 65000  no synchronization  bgp log-neighbor-changes  network 10.10.10.10/32  network 20.20.20.20/32  redistribute connected  neighbor 192.168.2.1 remote-as 64000 !  Router 3 ! interface Loopback1  ip address 2.2.2.1 255.255.255.255  no ip directed-broadcast  ip ospf password 0 test ! interface Loopback5  ip address 5.5.5.5 255.255.255.255  no ip directed-broadcast ! interface Loopback200  ip address 200.1.1.1 255.255.255.255  no ip directed-broadcast ! interface GigaEthernet0/2  ip address 192.168.1.2 255.255.255.0  no ip directed-broadcast  ip http firewalltype 0 ! router ospf 1  network 5.5.5.5 255.255.255.255 area 0  network 192.168.1.0 255.255.255.0 area 0 ! </pre>
<p><b>Procedure</b></p>	<p>Connect R1 to R1 over BGP.  Connect R1 to R2 over OSPF.  Configure R2 to redistribute BGP learned routes, using route-map.  ---- Filter BGP routes as follows then distribute in OSPF</p> <ol style="list-style-type: none"> <li>1) For 1.1.1.1 network – change default metric to 80 and change the route type to E1</li> <li>2) For 30.1.1.1 network – keep default metric as it is and only change route type to E1</li> <li>3) For 50.1.1.1 network – deny this route to redistribute in OSPF</li> <li>4) For 60.1.1.1 network – Default metric and default route type should get distributed into ospf.</li> </ol> <p>Configure IP access-lists on R2 to match networks learned via BGP.</p>

<p><b>Test result</b></p>	<p><b>Without route-map</b>, distributed Routes on R3 – with default metric and route type.</p> <pre> Router_3_62# Router_3_62#sh ip route ospf VRF ID: 0  O E2 1.1.1.1/32 [150,100] via 192.168.1.1 (on GigaEthernet0/2) O E2 30.1.1.1/32 [150,100] via 192.168.1.1 (on GigaEthernet0/2) O E2 50.1.1.1/32 [150,100] via 192.168.1.1 (on GigaEthernet0/2) O E2 60.1.1.1/32 [150,100] via 192.168.1.1 (on GigaEthernet0/2) O 100.1.1.1/32 [110,2] via 192.168.1.1 (on GigaEthernet0/2) Router_3_62# Router_3_62# </pre> <p>Routes on R3 <b>after applying route-map</b> into OSPF to change metric and route type.</p> <pre> Router_3_62#sh ip route ospf VRF ID: 0  O E1 1.1.1.1/32 [150,81] via 192.168.1.1 (on GigaEthernet0/2) O E1 30.1.1.1/32 [150,101] via 192.168.1.1 (on GigaEthernet0/2) O E2 60.1.1.1/32 [150,100] via 192.168.1.1 (on GigaEthernet0/2) O 100.1.1.1/32 [110,2] via 192.168.1.1 (on GigaEthernet0/2) Router_3_62# Router_3_62# </pre>
<p><b>Status</b></p>	<p>Filtered routes using route-map are displayed as filtered on R3.</p>