



Advanced CCIE Routing & Switching Workbook

TECHNOLOGY FOCUSED

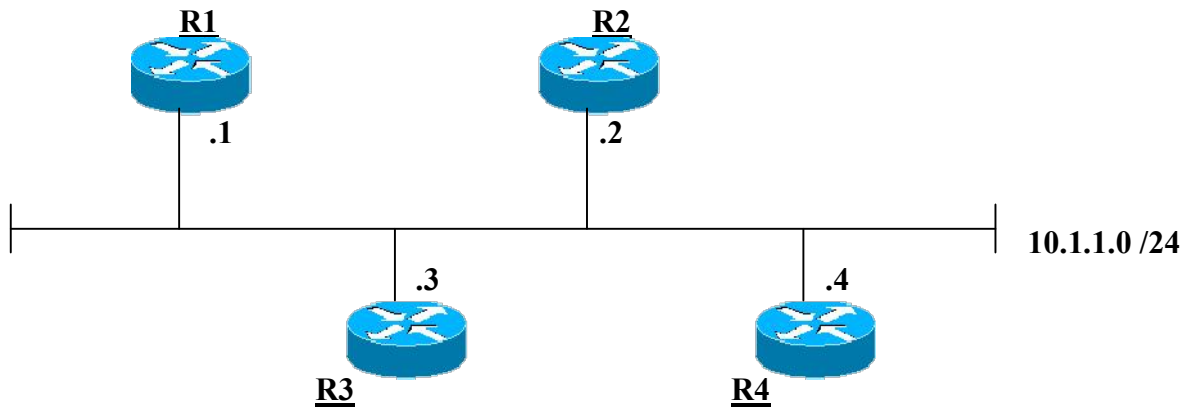
CCIE Routing and Switching

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BGP

Answers

Lab 1 – Establishing Neighbor Adjacency



Lab Setup:

- The F0/0 interface of these four routers should be configured in VLAN 100.
- Configure the routers according to the following IP addressing chart:

IP Addressing chart:

Routers	Interface / IP address	AS number
R1	F0/0 = 10.1.1.1 /24 Lo0 = 1.1.1.1 /8 Lo1 = 192.168.1.1 /24	AS 100
R2	F0/0 = 10.1.1.2 /24 Lo0 = 2.2.2.2 /8 Lo1 = 192.168.2.2 /24	AS 100
R3	F0/0 = 10.1.1.3 /24 Lo0 = 3.3.3.3 /8 Lo1 = 192.168.3.3 /24	AS 100
R4	F0/0 = 10.1.1.4 /24 Lo0 = 4.4.4.4 /8 Lo1 = 192.168.4.4 /24	AS 100

The setup can be downloaded from the CD provided with this work book.

Task 1

Configure these routers in AS 100, these routers should create an IBGP peer sessions between them, ensure that these routers advertise their Loopback 0 interface in this AS.

On R1

```
R1(config)#router bgp 100
R1(config-router)#neighbor 10.1.1.2 remote-as 100
R1(config-router)#neighbor 10.1.1.3 remote-as 100
R1(config-router)#neighbor 10.1.1.4 remote-as 100
R1(config-router)#no syn
R1(config-router)#network 1.0.0.0
```

On R2

```
R2(config)#router bgp 100
R2(config-router)#neighbor 10.1.1.1 remote-as 100
R2(config-router)#neighbor 10.1.1.3 remote-as 100
R2(config-router)#neighbor 10.1.1.4 remote-as 100
R2(config-router)#no syn
R2(config-router)#network 2.0.0.0
```

On R3

```
R3(config)#router bgp 100
R3(config-router)#neighbor 10.1.1.1 remote-as 100
R3(config-router)#neighbor 10.1.1.2 remote-as 100
R3(config-router)#neighbor 10.1.1.4 remote-as 100
R3(config-router)#no syn
R3(config-router)#network 3.0.0.0
```

On R4

```
R1(config)#router bgp 100
R4(config-router)#neighbor 10.1.1.1 remote-as 100
R4(config-router)#neighbor 10.1.1.2 remote-as 100
R4(config-router)#neighbor 10.1.1.3 remote-as 100
R4(config-router)#no syn
R4(config-router)#network 4.0.0.0
```

To verify the configuration:

On R1

R1#Show ip bgp

BGP table version is 5, local router ID is 1.1.1.1

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 1.0.0.0	0.0.0.0	0		32768	i
*>i2.0.0.0	10.1.1.2	0	100	0	i
*>i3.0.0.0	10.1.1.3	0	100	0	i
*>i4.0.0.0	10.1.1.4	0	100	0	i

*	Valid Table Entry.
>	The best entry for the Prefix.
S	The entry is suppressed.
i	The entry was learned via an IBGP, this is the “i” to the left of the network column. The letter “i” under the path column, specifies the origin of the route.
Network	Prefix entry for the network, if the mask is omitted, the default mask is assumed.
Next Hop	The next hop’s IP address to get to the specified network address, if it is 0.0.0.0 it is a prefix that is advertised by the local router.
Metric	This is the Inter-as metric, or the MED attribute which is 0 by default.
LocPrf	This is the local preference attribute, used in the route selection process carried within the local AS ONLY. With the local-pref attribute the higher value has more preference. The prefixes that are received from a peer AS are tagged with a local-pref value of 100; this value can be changed to influence the best path selection process. The changed value is only advertised to IBGP peers. When the local router advertises a prefix, no local-pref value is seen in the output of the “Show ip bgp” command. The default value of 100 can be changed by the “ BGP default local-preference ” command.
Weight	The prefixes that are received via a neighbor (IBGP or EBGP) will have a weight of 0, but the prefixes that are originated by the local router will have a weight value of 32768. This attribute overrides any other attribute for performing best path determination.
Path	If the prefixes were originated or learned via an IBGP neighbor, the path column will have the letter “i” without any ASN. If the prefix was learned through another AS, then this column will have the AS number/s followed by the letter i, the ASNs indicate the ASes that a prefix has traversed. The maximum number of ASes that a prefix can traverse through is 255.

Task 2

Reconfigure the routers as follows:

R2, R3 and R4 should be configured in AS 200, 300 and 400 respectively. Configure a full mesh peer session between these routers.

On R1

```
R1(config)#router bgp 100
R1(config-router)#neighbor 10.1.1.2 remote-as 200
R1(config-router)#neighbor 10.1.1.3 remote-as 300
R1(config-router)#neighbor 10.1.1.4 remote-as 400
R1(config-router)#no auto
R1(config-router)#network 1.0.0.0
```

On R2

```
R2(config)#router bgp 200
R2(config-router)#neighbor 10.1.1.1 remote-as 100
R2(config-router)#neighbor 10.1.1.3 remote-as 300
R2(config-router)#neighbor 10.1.1.4 remote-as 400
R2(config-router)#no auto
R2(config-router)#network 2.0.0.0
```

On R3

```
R3(config)#router bgp 300
R3(config-router)#neighbor 10.1.1.1 remote-as 100
R3(config-router)#neighbor 10.1.1.2 remote-as 200
R3(config-router)#neighbor 10.1.1.4 remote-as 400
R3(config-router)#no auto
R3(config-router)#network 3.0.0.0
```

On R4

```
R1(config)#router bgp 400
R4(config-router)#neighbor 10.1.1.1 remote-as 100
R4(config-router)#neighbor 10.1.1.2 remote-as 200
R4(config-router)#neighbor 10.1.1.3 remote-as 300
R4(config-router)#no auto
R4(config-router)#network 4.0.0.0
```

To verify the configuration:

On R1

R1#show ip bgp

BGP table version is 5, local router ID is 1.1.1.1

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 1.0.0.0	0.0.0.0	0		32768	i
*> 2.0.0.0	10.1.1.2	0		0	200 i
*	10.1.1.2			0	300 200 i
*	10.1.1.2			0	400 200 i
* 3.0.0.0	10.1.1.3			0	200 300 i
*>	10.1.1.3	0		0	300 i
*	10.1.1.3			0	400 300 i
* 4.0.0.0	10.1.1.4			0	200 400 i
*	10.1.1.4			0	300 400 i
*>	10.1.1.4	0		0	400 i

Note the local-preference attribute is not assigned on any of the prefixes; this is because the prefixes are advertised by an EBGP peer. The best selection in the above output is based on the shortest ASN.

The MED value (Metric column) is zero for some of the prefixes, and on others, it is NOT assigned, this is because when the prefix is advertised by the originating AS, the metric is set to “0”, but when the same prefix is advertised by another AS, the MED value is removed.

Task 3

Reconfigure the routers in AS 100; use the following policy for their IBGP peer sessions:

- Authentication must be enabled between the peers using “cisco” as the password.
- The peer session must be established based on the Loopback 0’s IP address.
- These routers should ONLY advertise their Loopback 1 in BGP.
- Provide NLRI to Loopback0 interface using RIPv2.
- The peer session between the routers should only be established if they are running BGP version 4.
- Use peer-groups to accomplish this task.

Cisco's implementation of BGP in IOS 12.0(5)T or earlier releases supports BGP versions 2, 3, and 4, with dynamic negotiation down to Version 2. But in IOS version 12.0(6)T or later, Cisco routers only support version 4 and they do not support dynamic negotiation down to Version 2. The reason you may see the "Neighbor version" command configured on some Cisco routers is because may be the router is connecting and establishing a peer session with a Non-Cisco router, or the administrator is not aware of this fact.

On R1

```
R1(config)#router bgp 100
R1(config-router)#no au
R1(config-router)#net 192.168.1.0
```

```
R1(config-router)#neighbor TST peer-group
R1(config-router)#neighbor TST remote-as 100
R1(config-router)#neighbor TST update-source lo0
R1(config-router)#neighbor TST version 4
R1(config-router)#neighbor TST password cisco
```

```
R1(config-router)#neighbor 2.2.2.2 peer-group TST
R1(config-router)#neighbor 3.3.3.3 peer-group TST
R1(config-router)#neighbor 4.4.4.4 peer-group TST
```

```
R1(config-router)#router rip
R1(config-router)#no au
R1(config-router)#ver 2
R1(config-router)#netw 10.0.0.0
R1(config-router)#netw 1.0.0.0
```

On R2

```
R2(config)#router bgp 100
R2(config-router)#no au
R2(config-router)#netw 192.168.2.0
```

```
R2(config-router)#neighbor TST peer-group
R2(config-router)#neighbor TST remote-as 100
R2(config-router)#neighbor TST update-source lo0
R2(config-router)#neighbor TST version 4
R2(config-router)#neighbor TST password cisco
```

```
R2(config-router)#neighbor 1.1.1.1 peer-group TST
R2(config-router)#neighbor 3.3.3.3 peer-group TST
```

```
R2(config-router)#neighbor 4.4.4.4 peer-group TST
```

```
R2(config-router)#router rip  
R2(config-router)#no au  
R2(config-router)#ver 2  
R2(config-router)#netw 10.0.0.0  
R2(config-router)#netw 2.0.0.0
```

On R3

```
R3(config)#router bgp 100  
R3(config-router)#no au  
R3(config-router)# network 192.168.3.0
```

```
R3(config-router)#neighbor TST peer-group  
R3(config-router)#neighbor TST remote-as 100  
R3(config-router)#neighbor TST update-source lo0  
R3(config-router)#neighbor TST version 4  
R3(config-router)#neighbor TST password cisco
```

```
R3(config-router)#neighbor 1.1.1.1 peer-group TST  
R3(config-router)#neighbor 2.2.2.2 peer-group TST  
R3(config-router)#neighbor 4.4.4.4 peer-group TST
```

```
R3(config-router)#router rip  
R3(config-router)#no au  
R3(config-router)#ver 2  
R3(config-router)#netw 10.0.0.0  
R3(config-router)#netw 3.0.0.0
```

On R4

```
R4(config)#router bgp 100  
R4(config-router)#no au  
R4(config-router)# network 192.168.4.0
```

```
R4(config-router)#neighbor TST peer-group  
R4(config-router)#neighbor TST remote-as 100  
R4(config-router)#neighbor TST update-source lo0  
R4(config-router)#neighbor TST version 4  
R4(config-router)#neighbor TST password cisco
```

```
R4(config-router)#neighbor 1.1.1.1 peer-group TST  
R4(config-router)#neighbor 2.2.2.2 peer-group TST  
R4(config-router)#neighbor 3.3.3.3 peer-group TST
```

```
R4(config-router)#router rip
R4(config-router)#no au
R4(config-router)#ver 2
R4(config-router)#netw 10.0.0.0
R4(config-router)#netw 4.0.0.0
```

To verify the configuration:

On R1

```
R1#Show ip bgp
```

BGP table version is 7, local router ID is 1.1.1.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 192.168.1.0	0.0.0.0	0		32768	i
*>i192.168.2.0	2.2.2.2	0	100	0	i
*>i192.168.3.0	3.3.3.3	0	100	0	i
*>i192.168.4.0	4.4.4.4	0	100	0	i

To verify the configuration:

On R1

```
R1#Show ip bgp peer-group
```

BGP peer-group is TST, **remote AS 100**
BGP version 4
Default minimum time between advertisement runs is 0 seconds

For address family: IPv4 Unicast
BGP neighbor is TST, peer-group internal, members:
2.2.2.2 3.3.3.3 4.4.4.4
Index 0, Offset 0, Mask 0x0
Update messages formatted 0, replicated 0
Number of NLRIs in the update sent: max 0, min 0

Note the output of the “Show ip bgp peer-group” reveals the ip address of the members of the peer-group.

Some of the benefits of peer-groups:

- **Peer-groups provide optimization of BGP convergence, Let's say a BGP speaker has 10 IBGP peers that exchange full BGP routing (200,000 prefixes), without the creation of a peer-group, the local router has to go through 2 million prefixes, whereas, if the same router was configured with a peer-group, the router would only go through 200,000 prefixes.**
- **It provides a mechanism for peers that have an identical outbound policy.**
- **Another benefit of peer-groups is that it can reduce the administrative overhead by cutting down redundant configuration on the routers.**

Task 4

Remove the BGP configuration from the routers and reconfigure the routers in AS 100 using peer-session templates; you should configure the following two templates to accomplish this task:

- Common Template: This template should contain the “**Neighbor version 4**” and “**Neighbor password**” command, this template should be applied to all neighbors.
- IBGP Template: This template should contain the “**Neighbor Update-source**” and “**Neighbor remote-as**” commands. This template should be applied to all IBGP neighbors.

You should advertise Loopback1 interface in BGP and Loopback0 should be used as the IP address for establishing the peer sessions. DO NOT remove RIPv2's configuration.

On R1

```
R1(config)#router bgp 100
R1(config-router)#no au
R1(config-router)#network 192.168.1.0
```

```
R1(config-router)#template peer-session Common
R1(config-router-stmp)#password cisco
R1(config-router-stmp)#version 4
R1(config-router-stmp)#exit-peer-session
```

```
R1(config-router)#template peer-session IBGP
R1(config-router-stmp)#inherit peer-session Common
R1(config-router-stmp)#update-source lo0
R1(config-router-stmp)#remote-as 100
R1(config-router-stmp)#exit-peer-session
```

```
R1(config-router)#neighbor 2.2.2.2 inherit peer-session IBGP
R1(config-router)#neighbor 3.3.3.3 inherit peer-session IBGP
R1(config-router)#neighbor 4.4.4.4 inherit peer-session IBGP
```

On R2

```
R2(config)#router bgp 100
R2(config-router)#no au
R2(config-router)#network 192.168.2.0
```

```
R2(config-router)#template peer-session Common
R2(config-router-stmp)#password cisco
R2(config-router-stmp)#version 4
R2(config-router-stmp)#exit-peer-session
```

```
R2(config-router)#template peer-session IBGP
R2(config-router-stmp)#inherit peer-session Common
R2(config-router-stmp)#update-source lo0
R2(config-router-stmp)#remote-as 100
R2(config-router-stmp)#exit-peer-session
```

```
R2(config-router)#neighbor 1.1.1.1 inherit peer-session IBGP
R2(config-router)#neighbor 3.3.3.3 inherit peer-session IBGP
R2(config-router)#neighbor 4.4.4.4 inherit peer-session IBGP
```

On R3

```
R3(config)#router bgp 100
R3(config-router)#no au
R3(config-router)#network 192.168.3.0
```

```
R3(config-router)#template peer-session Common
R3(config-router-stmp)#password cisco
R3(config-router-stmp)#version 4
R3(config-router-stmp)#exit-peer-session
```

```
R3(config-router)#template peer-session IBGP
R3(config-router-stmp)#inherit peer-session Common
R3(config-router-stmp)#update-source lo0
R3(config-router-stmp)#remote-as 100
R3(config-router-stmp)#exit-peer-session
```

```
R3(config-router)#neighbor 1.1.1.1 inherit peer-session IBGP
R3(config-router)#neighbor 2.2.2.2 inherit peer-session IBGP
R3(config-router)#neighbor 4.4.4.4 inherit peer-session IBGP
```

On R4

```
R4(config)#router bgp 100
R4(config-router)#no au
R4(config-router)#network 192.168.4.0
```

```
R4(config-router)#template peer-session Common
R4(config-router-stmp)#password cisco
R4(config-router-stmp)#version 4
R4(config-router-stmp)#exit-peer-session
```

```
R4(config-router)#template peer-session IBGP
R4(config-router-stmp)#inherit peer-session Common
R4(config-router-stmp)#update-source lo0
R4(config-router-stmp)#remote-as 100
R4(config-router-stmp)#exit-peer-session
```

```
R4(config-router)#neighbor 1.1.1.1 inherit peer-session IBGP
R4(config-router)#neighbor 2.2.2.2 inherit peer-session IBGP
R4(config-router)#neighbor 3.3.3.3 inherit peer-session IBGP
```

To verify the configuration:

On R1

R1#Show ip bgp

BGP table version is 5, local router ID is 192.168.1.1

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 192.168.1.0	0.0.0.0	0		32768	i
*>i192.168.2.0	2.2.2.2	0	100	0	i
*>i192.168.3.0	3.3.3.3	0	100	0	i
*>i192.168.4.0	4.4.4.4	0	100	0	i

- **Peer-session template can be used to apply session specific configuration commands to a group of neighbors that share a common session configuration.**
- **Peer-session templates can be reused and they support inheritance of another peer-session template/s, this means that nested peer-sessions can also be used.**
- **Peer-session templates support session specific commands ONLY.**

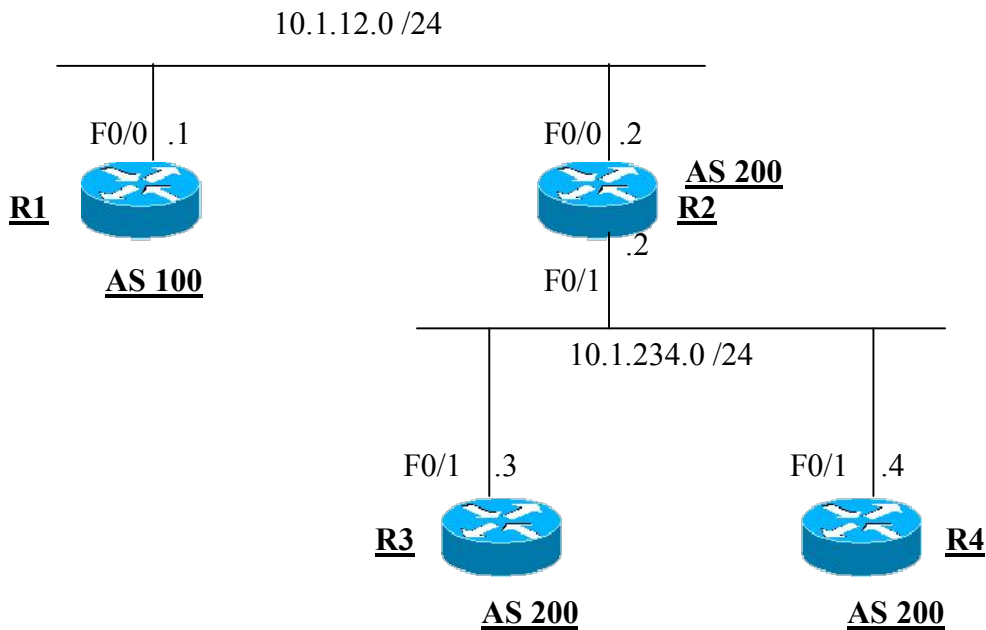
Task 5

Reconfigure the routers based on the following IP address space and diagram.

Lab Setup:

- Configure F0/0 interface of R1 and R2 are in VLAN 12 and the F0/1 interface of R2, R3 and R4 in VLAN 234.
- Configure IP addressing on the routers using the IP addressing chart on the next page.

The setup can be downloaded from the CD provided with this work book.



IP Addressing chart:

Router	AS number	Interface / IP address
R1	AS 100	Lo0 = 1.1.0.1 /24 Lo1 = 1.1.1.1 /24 Lo2 = 1.1.2.1 /24 Lo3 = 1.1.3.1 /24 Lo4 = 100.1.1.1 /24 Lo5 = 100.2.2.1 /24 F0/0 = 10.1.12.1 /24
R2	AS 200	Lo0 = 2.2.2.2 /8 F0/0 = 10.1.12.2 /24 F0/1 = 10.1.234.2 /24
R3	AS 200	Lo0 = 3.3.3.3 /8 F0/1 = 10.1.234.3 /24
R4	AS 200	Lo0 = 4.4.4.4 /8 F0/1 = 10.1.234.4 /24

Task 6

- R1 in AS 100 should establish an EBGP peer session with R2 in AS 200. R1 should advertise all of it's loopback interfaces in AS 100.
- R2, R3 and R4 should be configured in AS 200; these routers should establish IBGP peer sessions between them and advertise their loopback 0 interface in AS 200.

- Configure the router-ids of the routers as follows:

R1 = 10.1.1.1, R2 = 10.2.2.2, R3 = 10.3.3.3 and R4 = 10.4.4.4

On R1

```
R1(config)#router bgp 100
R1(config-router)#bgp router-id 10.1.1.1
R1(config-router)#network 1.1.0.0 mask 255.255.255.0
R1(config-router)#network 1.1.1.0 mask 255.255.255.0
R1(config-router)#network 1.1.2.0 mask 255.255.255.0
R1(config-router)#network 1.1.3.0 mask 255.255.255.0
R1(config-router)#network 100.1.1.0 mask 255.255.255.0
R1(config-router)#network 100.2.2.0 mask 255.255.255.0
R1(config-router)#neighbor 10.1.12.2 remote-as 200
R1(config-router)#no auto-summary
```

On R2

```
R2(config)#router bgp 200
R2(config-router)#no synchronization
R2(config-router)#bgp router-id 10.2.2.2
R2(config-router)#network 2.0.0.0
R2(config-router)#neighbor 10.1.12.1 remote-as 100
R2(config-router)#neighbor 10.1.234.3 remote-as 200
R2(config-router)#neighbor 10.1.234.4 remote-as 200
R2(config-router)#no auto-summary
```

On R3

```
R3(config)#router bgp 200
R3(config-router)#no synchronization
R3(config-router)#bgp router-id 10.3.3.3
R3(config-router)#network 3.0.0.0
R3(config-router)#neighbor 10.1.234.2 remote-as 200
R3(config-router)#neighbor 10.1.234.4 remote-as 200
R3(config-router)#no auto-summary
```

On R4

```
R4(config)#router bgp 200
R4(config-router)#no synchronization
R4(config-router)#bgp router-id 10.4.4.4
R4(config-router)#network 4.0.0.0
```

```
R4(config-router)#neighbor 10.1.234.2 remote-as 200
R4(config-router)#neighbor 10.1.234.3 remote-as 200
R4(config-router)#no auto-summary
```

To verify the configuration:

On R1

R1#Show ip bgp

BGP table version is 16, local router ID is 10.1.1.1

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 1.1.0.0/24	0.0.0.0	0		32768	i
*> 1.1.1.0/24	0.0.0.0	0		32768	i
*> 1.1.2.0/24	0.0.0.0	0		32768	i
*> 1.1.3.0/24	0.0.0.0	0		32768	i
*> 2.0.0.0	10.1.12.2	0		0 200	i
*> 3.0.0.0	10.1.12.2			0 200	i
*> 4.0.0.0	10.1.12.2			0 200	i
*> 100.1.1.0/24	0.0.0.0	0		32768	i
*> 100.2.2.0/24	0.0.0.0	0		32768	i

On R2

R2#Sh ip bgp

BGP table version is 10, local router ID is 10.2.2.2

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 1.1.0.0/24	10.1.12.1	0		0 100	i
*> 1.1.1.0/24	10.1.12.1	0		0 100	i
*> 1.1.2.0/24	10.1.12.1	0		0 100	i
*> 1.1.3.0/24	10.1.12.1	0		0 100	i
*> 2.0.0.0	0.0.0.0	0		32768	i
*>i3.0.0.0	10.1.234.3	0	100	0	i
*>i4.0.0.0	10.1.234.4	0	100	0	i
*>100.1.1.0/24	10.1.12.1	0		0 100	i

```
*> 100.2.2.0/24 10.1.12.1 0 0 100 i
```

On R3

R3#Sh ip bgp

BGP table version is 18, local router ID is 10.3.3.3

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
* i1.1.0.0/24	10.1.12.1	0	100	0	100 i
* i1.1.1.0/24	10.1.12.1	0	100	0	100 i
* i1.1.2.0/24	10.1.12.1	0	100	0	100 i
* i1.1.3.0/24	10.1.12.1	0	100	0	100 i
*>i2.0.0.0	10.1.234.2	0	100	0	i
*> 3.0.0.0	0.0.0.0	0		32768	i
*>i4.0.0.0	10.1.234.4	0	100	0	i
* i100.1.1.0/24	10.1.12.1	0	100	0	100 i
* i100.2.2.0/24	10.1.12.1	0	100	0	100 i

On R4

R4#Sh ip bgp

BGP table version is 20, local router ID is 10.4.4.4

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
* i1.1.0.0/24	10.1.12.1	0	100	0	100 i
* i1.1.1.0/24	10.1.12.1	0	100	0	100 i
* i1.1.2.0/24	10.1.12.1	0	100	0	100 i
* i1.1.3.0/24	10.1.12.1	0	100	0	100 i
*>i2.0.0.0	10.1.234.2	0	100	0	i
*>i3.0.0.0	10.1.234.3	0	100	0	i
*> 4.0.0.0	0.0.0.0	0		32768	i
* i100.1.1.0/24	10.1.12.1	0	100	0	100 i
* i100.2.2.0/24	10.1.12.1	0	100	0	100 i

Note R3 and R4 do not have NLRI to the next-hop IP address of 10.1.12.1, therefore, they won't have reachability to these addresses.

Task 7

Configure R2 to change the next hop IP address for all the networks advertised by R1 to the IP address of its F0/1 interface. You should use a template so the future policies can be installed once in that template and have it effect R3 and R4. DO NOT use peer-groups to accomplish this task.

On R2

```
R2(config)#router bgp 200
```

```
R2(config-router)# template peer-policy TST
```

```
R2(config-router-ptmp)# next-hop-self
```

```
R2(config-router-ptmp)#exit-peer-policy
```

```
R2(config-router)#neighbor 10.1.234.3 inherit peer-policy TST
```

```
R2(config-router)#neighbor 10.1.234.4 inherit peer-policy TST
```

To verify the configuration:

On R3

```
R3#Sh ip bgp
```

BGP table version is 18, local router ID is 3.3.3.3

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> i1.1.0.0/24	10.1.234.2	0	100	0	100 i
*> i1.1.1.0/24	10.1.234.2	0	100	0	100 i
*>i1.1.2.0/24	10.1.234.2	0	100	0	100 i
*> i1.1.3.0/24	10.1.234.2	0	100	0	100 i
*>i2.0.0.0	10.1.234.2	0	100	0	i
*> 3.0.0.0	0.0.0.0	0		32768	i
*>i4.0.0.0	10.1.234.4	0	100	0	i
*> i100.1.1.0/24	10.1.234.2	0	100	0	100 i
*>i100.2.2.0/24	10.1.234.2	0	100	0	100 i

On R4

R4#Sh ip bgp

BGP table version is 20, local router ID is 4.4.4.4

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> i1.1.0.0/24	10.1.234.2	0	100	0	100 i
*> i1.1.1.0/24	10.1.234.2	0	100	0	100 i
*> i1.1.2.0/24	10.1.234.2	0	100	0	100 i
*> i1.1.3.0/24	10.1.234.2	0	100	0	100 i
*> i2.0.0.0	10.1.234.2	0	100	0	i
*> i3.0.0.0	10.1.234.3	0	100	0	i
*> 4.0.0.0	0.0.0.0	0		32768	i
* >i100.1.1.0/24	10.1.234.2	0	100	0	100 i
*> i100.2.2.0/24	10.1.234.2	0	100	0	100 i

Peer-policy templates are used to build a template of policy information that can be inherited by a given neighbor. The peer-policy template can not be inherited by a peer-session template or a peer-group.

Task 8

Erase the startup configuration and reload the routers before proceeding to the next lab.