iBGP network configuration

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**Purpose**

The objective of this lab is to study Internal Border Gateway Protocol (iBGP) and find various methods for integrating this protocol into network topologies. The main purpose is to demonstrate successful implementation of this. The CCNPs are tasked with configuring their own BGP networks, incorporating multiple autonomous systems internally and externally, and verifying the functionality of the internal aspects.

**Background Info**

Border Gateway Protocol, commonly known as BGP, serves as the principal routing protocol for the internet. Internal BGP (iBGP) denotes the establishment of a BGP session between routers within the same autonomous system (AS). Unlike external BGP (eBGP), iBGP is restricted to propagating routes solely within a single AS, facilitating a comprehensive view of the network topology. The following points delineate several distinctions between eBGP and iBGP:

|  |  |
| --- | --- |
| iBGP | eBGP |
| The default administrative distance (AD) for iBGP is set higher at 200. | The default administrative distance (AD) for eBGP is set lower at 20, thus affording it greater priority |
| iBGP peers do not need to be directly connected to communicate with each other. | eBGP peers *do* need to be directly connected to communicate with each other. |
| iBGP employs split horizon to address routing loop issues and restricts iBGP peers from advertising to each other. | eBGP utilizes AS\_PATH and other mechanisms for the same purpose. |
| By default, iBGP packets have a TTL of 255 hops, enabling multiple hops between routers within the same AS. | eBGP packets have a default TTL of only 1, designed for single-hop communication between neighbors in different autonomous systems. |
| iBGP is predominantly used for internal operations within ISPs. | eBGP is utilized for connecting ISPs to their consumers. |

Some additional information includes:

* iBGP permits route propagation to eBGP peers but not to other iBGP peers, a mechanism known as split horizon.
* To prevent routing loops within the same AS, iBGP necessitates a full mesh network topology, or alternatively, route reflectors and confederations. Additionally, an Interior Gateway Protocol (IGP), such as OSPF, is typically employed to propagate routes between all routers in the AS.
* iBGP utilizes the Local Preference attribute for routing decisions, assigning a specific value to each router's routes.
* By default, the next-hop IP address in iBGP is the IP address of the router that initially advertised the route. However, the "next-hop self" command allows routers to modify these next-hop addresses, eliminating the need for an IGP in the iBGP AS in certain scenarios.

While Internal Border Gateway Protocol shares many similarities with External BGP in configuration and operation, these points highlight key differentiating factors of this internal protocol.

**Lab Summary**

1. Design a topology with 3 routers, each with their own autonomous systems and external routing protocol on a loopback interface
2. Use the topology to set up the physical network with the cables and such
3. Assign IPv4 and IPv6 addresses on router interfaces
4. Configure BGP autonomous systems and neighbors
5. Configure other respective routing protocols on loopback interfaces (EIGRP/OSPF/RIP)
   1. Our team decided to use OSPF as our respective routing protocol
6. Assign router IDs for all routers and all routing protocols
7. Enter the no shut command to get interfaces up and for BGP adjacencies to be established
8. Configure the weight, AS path, and BGP timers on all speakers
9. Test connectivity and troubleshoot issues that may arise

**Lab Commands**

**neighbor [*ip address*] update-source [*ip address | loopback #*]**

This command specifies the source address to reach the neighbor. An iBGP connection can occur as long as there is a TCP/IP path between the routers. If multiple paths exist between the iBGP routers, using a loopback interface as the neighbor address can add stability to the network.

**Network Diagram/Topology**

A diagram of a diagram of a computer

Description automatically generated with medium confidence

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | g0/0/0 | g0/0/1 | lo0 | BGP AS |
| R1 | 10.10.12.1/24 | - | 1.1.1.1/24 | 1 |
| R2 | 10.10.23.1/24 | 10.10.12.2/24 | 2.2.2.2/32 | 2 |
| R3 | 10.10.34.1/24 | 10.10.23.2/24 | - | 2 |
| R4 | 10.10.45.1/24 | 10.10.34.2/24 | 4.4.4.4/32 | 2 |
| R5 | - | 10.10.45.2/24 | 5.5.5.5/24 | 3 |

**Configurations** – show run/show ip route

**Router 1**

show run

Current configuration : 1835 bytes

!

! Last configuration change at 18:01:21 UTC Tue Jan 23 2024

!

version 16.7

service timestamps debug datetime msec

service timestamps log datetime msec

platform qfp utilization monitor load 80

no platform punt-keepalive disable-kernel-core

!

hostname R1

!

boot-start-marker

boot-end-marker

!

vrf definition Mgmt-intf

!

address-family ipv4

exit-address-family

!

address-family ipv6

exit-address-family

!

no aaa new-model

!

subscriber templating

!

vtp domain cisco

vtp mode transparent

!

multilink bundle-name authenticated

!

license udi pid ISR4321/K9 sn FDO220523GF

license boot level appxk9

no license smart enable

diagnostic bootup level minimal

!

spanning-tree extend system-id

!

redundancy

mode none

!

interface Loopback0

ip address 1.1.1.1 255.255.255.255

!

interface GigabitEthernet0/0/0

ip address 10.10.12.1 255.255.255.0

negotiation auto

!

interface GigabitEthernet0/0/1

no ip address

negotiation auto

!

interface Serial0/1/0

no ip address

shutdown

!

interface Serial0/1/1

no ip address

shutdown

!

interface GigabitEthernet0/2/0

no ip address

shutdown

negotiation auto

!

interface GigabitEthernet0/2/1

no ip address

shutdown

negotiation auto

!

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

shutdown

negotiation auto

!

router bgp 1

bgp log-neighbor-changes

network 1.1.1.1 mask 255.255.255.255

redistribute connected

neighbor 10.10.12.2 remote-as 2

!

ip forward-protocol nd

ip http server

ip http authentication local

ip http secure-server

ip tftp source-interface GigabitEthernet0

!

control-plane

!

line con 0

transport input none

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

!

wsma agent exec

!

wsma agent config

!

wsma agent filesys

!

wsma agent notify

!

End

show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2

i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2

ia - IS-IS inter area, \* - candidate default, U - per-user static route

o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP

a - application route

+ - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

1.0.0.0/32 is subnetted, 1 subnets

C 1.1.1.1 is directly connected, Loopback0

2.0.0.0/32 is subnetted, 1 subnets

B 2.2.2.2 [20/0] via 10.10.12.2, 00:26:25

4.0.0.0/32 is subnetted, 1 subnets

B 4.4.4.4 [20/3] via 10.10.12.2, 00:26:25

5.0.0.0/24 is subnetted, 1 subnets

B 5.5.5.0 [20/0] via 10.10.12.2, 00:20:04

10.0.0.0/8 is variably subnetted, 5 subnets, 2 masks

C 10.10.12.0/24 is directly connected, GigabitEthernet0/0/0

L 10.10.12.1/32 is directly connected, GigabitEthernet0/0/0

B 10.10.23.0/24 [20/0] via 10.10.12.2, 00:26:25

B 10.10.34.0/24 [20/2] via 10.10.12.2, 00:26:25

B 10.10.45.0/24 [20/0] via 10.10.12.2, 00:19:34

**Router 2**

show run

Current configuration : 4303 bytes

! Last configuration change at 17:28:21 UTC Tue Jan 23 2024

version 16.9

service timestamps debug datetime msec

service timestamps log datetime msec

platform qfp utilization monitor load 80

platform punt-keepalive disable-kernel-core

hostname R2

boot-start-marker

boot-end-marker

vrf definition Mgmt-intf

address-family ipv4

exit-address-family

address-family ipv6

exit-address-family

no aaa new-model

!

!

login on-success log

subscriber templating

vtp domain cisco

vtp mode transparent

multilink bundle-name authenticated

crypto pki trustpoint TP-self-signed-2189345785

enrollment selfsigned

subject-name cn=IOS-Self-Signed-Certificate-2189345785

revocation-check none

rsakeypair TP-self-signed-2189345785

crypto pki certificate chain TP-self-signed-2189345785

license udi pid ISR4321/K9 sn FDO21482DXE

license boot level appxk9

no license smart enable

diagnostic bootup level minimal

spanning-tree extend system-id

redundancy

mode none

interface Loopback0

ip address 2.2.2.2 255.255.255.255

interface GigabitEthernet0/0/0

ip address 10.10.23.1 255.255.255.0

negotiation auto

interface GigabitEthernet0/0/1

ip address 10.10.12.2 255.255.255.0

negotiation auto

interface Serial0/1/0

no ip address

shutdown

interface Serial0/1/1

no ip address

shutdown

interface GigabitEthernet0/2/0

no ip address

shutdown

negotiation auto

interface GigabitEthernet0/2/1

no ip address

shutdown

negotiation auto

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

shutdown

negotiation auto

router ospf 1

redistribute connected subnets

redistribute bgp 2 subnets

network 2.2.2.2 0.0.0.0 area 0

network 4.4.4.4 0.0.0.0 area 0

network 10.10.23.0 0.0.0.255 area 0

network 10.10.34.0 0.0.0.255 area 0

router bgp 2

bgp log-neighbor-changes

redistribute connected

redistribute ospf 1

neighbor 4.4.4.4 remote-as 2

neighbor 4.4.4.4 update-source Loopback0

neighbor 10.10.12.1 remote-as 1

neighbor 10.10.23.2 remote-as 2

ip forward-protocol nd

ip http server

ip http authentication local

ip http secure-server

ip tftp source-interface GigabitEthernet0

control-plane

line con 0

transport input none

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

End

show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2

i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2

ia - IS-IS inter area, \* - candidate default, U - per-user static route

o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP

a - application route

+ - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

1.0.0.0/32 is subnetted, 1 subnets

B 1.1.1.1 [20/0] via 10.10.12.1, 00:59:20

2.0.0.0/32 is subnetted, 1 subnets

C 2.2.2.2 is directly connected, Loopback0

4.0.0.0/32 is subnetted, 1 subnets

O 4.4.4.4 [110/3] via 10.10.23.2, 01:04:45, GigabitEthernet0/0/0

5.0.0.0/24 is subnetted, 1 subnets

O E2 5.5.5.0 [110/1] via 10.10.23.2, 00:30:58, GigabitEthernet0/0/0

10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks

C 10.10.12.0/24 is directly connected, GigabitEthernet0/0/1

L 10.10.12.2/32 is directly connected, GigabitEthernet0/0/1

C 10.10.23.0/24 is directly connected, GigabitEthernet0/0/0

L 10.10.23.1/32 is directly connected, GigabitEthernet0/0/0

O 10.10.34.0/24 [110/2] via 10.10.23.2, 01:04:45, GigabitEthernet0/0/0

O E2 10.10.45.0/24 [110/20] via 10.10.23.2, 00:25:40, GigabitEthernet0/0/0

**Router 3**

show run

Current configuration : 4146 bytes

! Last configuration change at 17:18:29 UTC Tue Jan 23 2024

version 16.9

service timestamps debug datetime msec

service timestamps log datetime msec

platform qfp utilization monitor load 80

platform punt-keepalive disable-kernel-core

hostname R3

boot-start-marker

boot-end-marker

vrf definition Mgmt-intf

address-family ipv4

exit-address-family

address-family ipv6

exit-address-family

no aaa new-model

login on-success log

subscriber templating

vtp domain cisco

vtp mode transparent

multilink bundle-name authenticated

crypto pki trustpoint TP-self-signed-2557841031

enrollment selfsigned

subject-name cn=IOS-Self-Signed-Certificate-2557841031

revocation-check none

rsakeypair TP-self-signed-2557841031

crypto pki certificate chain TP-self-signed-2557841031

license udi pid ISR4321/K9 sn FDO21500G1N

license boot level appxk9

no license smart enable

diagnostic bootup level minimal

spanning-tree extend system-id

redundancy

mode none

interface Loopback0

no ip address

interface GigabitEthernet0/0/0

ip address 10.10.34.1 255.255.255.0

negotiation auto

interface GigabitEthernet0/0/1

ip address 10.10.23.2 255.255.255.0

negotiation auto

interface Serial0/1/0

no ip address

shutdown

interface Serial0/1/1

no ip address

shutdown

interface GigabitEthernet0/2/0

no ip address

shutdown

negotiation auto

interface GigabitEthernet0/2/1

no ip address

shutdown

negotiation auto

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

shutdown

negotiation auto

router ospf 1

redistribute connected subnets

redistribute bgp 2 subnets

network 10.10.23.0 0.0.0.255 area 0

network 10.10.34.0 0.0.0.255 area 0

router bgp 2

bgp log-neighbor-changes

redistribute connected

redistribute ospf 1

neighbor 10.10.23.1 remote-as 2

neighbor 10.10.34.2 remote-as 2

ip forward-protocol nd

ip http server

ip http authentication local

ip http secure-server

ip tftp source-interface GigabitEthernet0

control-plane

line con 0

transport input none

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

End

show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2

i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2

ia - IS-IS inter area, \* - candidate default, U - per-user static route

o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP

a - application route

+ - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

1.0.0.0/32 is subnetted, 1 subnets

O E2 1.1.1.1 [110/1] via 10.10.23.1, 00:35:52, GigabitEthernet0/0/1

2.0.0.0/32 is subnetted, 1 subnets

O 2.2.2.2 [110/2] via 10.10.23.1, 01:09:07, GigabitEthernet0/0/1

4.0.0.0/32 is subnetted, 1 subnets

O 4.4.4.4 [110/2] via 10.10.34.2, 01:09:37, GigabitEthernet0/0/0

5.0.0.0/24 is subnetted, 1 subnets

O E2 5.5.5.0 [110/1] via 10.10.34.2, 00:35:19, GigabitEthernet0/0/0

10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks

O E2 10.10.12.0/24 [110/20] via 10.10.23.1, 00:30:51, GigabitEthernet0/0/1

C 10.10.23.0/24 is directly connected, GigabitEthernet0/0/1

L 10.10.23.2/32 is directly connected, GigabitEthernet0/0/1

C 10.10.34.0/24 is directly connected, GigabitEthernet0/0/0

L 10.10.34.1/32 is directly connected, GigabitEthernet0/0/0

O E2 10.10.45.0/24 [110/20] via 10.10.34.2, 00:30:02, GigabitEthernet0/0/0

**Router 4**

show run

Current configuration : 4091 bytes

! Last configuration change at 17:29:15 UTC Tue Jan 23 2024

version 16.9

service timestamps debug datetime msec

service timestamps log datetime msec

platform qfp utilization monitor load 80

platform punt-keepalive disable-kernel-core

hostname R4

boot-start-marker

boot-end-marker

vrf definition Mgmt-intf

address-family ipv4

exit-address-family

address-family ipv6

exit-address-family

no aaa new-model

login on-success log

subscriber templating

vtp domain cisco

vtp mode transparent

multilink bundle-name authenticated

crypto pki trustpoint TP-self-signed-1457377718

enrollment selfsigned

subject-name cn=IOS-Self-Signed-Certificate-1457377718

revocation-check none

rsakeypair TP-self-signed-1457377718

crypto pki certificate chain TP-self-signed-1457377718

certificate self-signed 01

license udi pid ISR4321/K9 sn FDO21441WDF

no license smart enable

diagnostic bootup level minimal

spanning-tree extend system-id

redundancy

mode none

interface Loopback0

ip address 4.4.4.4 255.255.255.255

interface GigabitEthernet0/0/0

ip address 10.10.45.1 255.255.255.0

negotiation auto

interface GigabitEthernet0/0/1

ip address 10.10.34.2 255.255.255.0

negotiation auto

interface Serial0/1/0

no ip address

shutdown

interface Serial0/1/1

no ip address

shutdown

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

shutdown

negotiation auto

router ospf 1

redistribute connected subnets

redistribute bgp 2 subnets

network 2.2.2.2 0.0.0.0 area 0

network 4.4.4.4 0.0.0.0 area 0

network 10.10.23.0 0.0.0.255 area 0

network 10.10.34.0 0.0.0.255 area 0

router bgp 2

bgp log-neighbor-changes

redistribute connected

redistribute ospf 1

neighbor 2.2.2.2 remote-as 2

neighbor 2.2.2.2 update-source Loopback0

neighbor 10.10.34.1 remote-as 2

neighbor 10.10.45.2 remote-as 3

ip forward-protocol nd

ip http server

ip http authentication local

ip http secure-server

ip tftp source-interface GigabitEthernet0

control-plane

line con 0

transport input none

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

End

show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2

i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2

ia - IS-IS inter area, \* - candidate default, U - per-user static route

o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP

a - application route

+ - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

1.0.0.0/32 is subnetted, 1 subnets

O E2 1.1.1.1 [110/1] via 10.10.34.1, 00:39:08, GigabitEthernet0/0/1

2.0.0.0/32 is subnetted, 1 subnets

O 2.2.2.2 [110/3] via 10.10.34.1, 01:12:20, GigabitEthernet0/0/1

4.0.0.0/32 is subnetted, 1 subnets

C 4.4.4.4 is directly connected, Loopback0

5.0.0.0/24 is subnetted, 1 subnets

B 5.5.5.0 [20/0] via 10.10.45.2, 01:00:01

10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks

O E2 10.10.12.0/24 [110/20] via 10.10.34.1, 00:34:07, GigabitEthernet0/0/1

O 10.10.23.0/24 [110/2] via 10.10.34.1, 01:12:54, GigabitEthernet0/0/1

C 10.10.34.0/24 is directly connected, GigabitEthernet0/0/1

L 10.10.34.2/32 is directly connected, GigabitEthernet0/0/1

C 10.10.45.0/24 is directly connected, GigabitEthernet0/0/0

L 10.10.45.1/32 is directly connected, GigabitEthernet0/0/0

**Router 5**

show run

Current configuration : 3669 bytes

! Last configuration change at 17:12:10 UTC Tue Jan 23 2024

version 16.9

service timestamps debug datetime msec

service timestamps log datetime msec

platform qfp utilization monitor load 80

platform punt-keepalive disable-kernel-core

hostname R5

boot-start-marker

boot-end-marker

vrf definition Mgmt-intf

address-family ipv4

exit-address-family

address-family ipv6

exit-address-family

no aaa new-model

login on-success log

subscriber templating

multilink bundle-name authenticated

crypto pki trustpoint TP-self-signed-2054344109

enrollment selfsigned

subject-name cn=IOS-Self-Signed-Certificate-2054344109

revocation-check none

rsakeypair TP-self-signed-2054344109

crypto pki certificate chain TP-self-signed-2054344109

certificate self-signed 01

license udi pid ISR4321/K9 sn FDO215009QY

no license smart enable

diagnostic bootup level minimal

spanning-tree extend system-id

redundancy

mode none

interface Loopback0

ip address 5.5.5.5 255.255.255.0

interface GigabitEthernet0/0/0

no ip address

negotiation auto

interface GigabitEthernet0/0/1

ip address 10.10.45.2 255.255.255.0

negotiation auto

interface Serial0/1/0

no ip address

interface Serial0/1/1

no ip address

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

negotiation auto

router bgp 3

bgp log-neighbor-changes

network 5.5.5.0 mask 255.255.255.0

redistribute connected

neighbor 10.10.45.1 remote-as 2

ip forward-protocol nd

no ip http server

ip http secure-server

ip tftp source-interface GigabitEthernet0

control-plane

line con 0

transport input none

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

end

show ip route

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2

i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2

ia - IS-IS inter area, \* - candidate default, U - per-user static route

o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP

a - application route

+ - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

1.0.0.0/32 is subnetted, 1 subnets

B 1.1.1.1 [20/0] via 10.10.45.1, 00:36:40

2.0.0.0/32 is subnetted, 1 subnets

B 2.2.2.2 [20/3] via 10.10.45.1, 00:36:40

4.0.0.0/32 is subnetted, 1 subnets

B 4.4.4.4 [20/0] via 10.10.45.1, 00:36:40

5.0.0.0/8 is variably subnetted, 2 subnets, 2 masks

C 5.5.5.0/24 is directly connected, Loopback0

L 5.5.5.5/32 is directly connected, Loopback0

10.0.0.0/8 is variably subnetted, 5 subnets, 2 masks

B 10.10.12.0/24 [20/0] via 10.10.45.1, 00:37:10

B 10.10.23.0/24 [20/2] via 10.10.45.1, 00:36:40

B 10.10.34.0/24 [20/0] via 10.10.45.1, 00:36:40

C 10.10.45.0/24 is directly connected, GigabitEthernet0/0/1

L 10.10.45.2/32 is directly connected, GigabitEthernet0/0/1

**Show BGP Summary**

R1:A screenshot of a computer

Description automatically generated

R2:

A screenshot of a computer screen

Description automatically generated

R3:

A screenshot of a computer program

Description automatically generated

R4:

A screenshot of a computer screen

Description automatically generated

R5:A screenshot of a computer screen

Description automatically generated

**BGP Neighbors**

R1:

A black screen with white text

Description automatically generated

R2:

A computer screen shot of a black screen

Description automatically generated

R3:

A screen shot of a computer

Description automatically generated

R4:

A computer screen with white text

Description automatically generated

R5:

A black screen with white text

Description automatically generated

**Pings:**

R1 to R5A computer screen with white text

Description automatically generatedR5 to R1

A computer screen shot of white text

Description automatically generated

**Problems**

* When we were configuring the BGP AS, a router was assigned the wrong AS. We were getting spam error messages, making it literally impossible to type commands in because of the error messages covering up our screen, and its neighbored. We placed it back in the correct AS, and the problem was solved.
* We were not able to ping even after all the OSPF/BGP protocols were locally configured on the outers. We double check our configuration and found that this was because we orgot to redistribute the routes. We entered the redistribution commands to all the local routes (into BGP) and BGP (into OSPF), and we successfully got the ping to work across the network.

**Conclusion**

In this lab, our team effectively established a fundamental iBGP network by integrating the internal routing protocol OSPF. We devised the logical topology and IP allocation, implemented it on a physical rack, addressed encountered challenges, conducted analysis, troubleshooting, and meticulously documented our procedures and findings in the provided documentation. Throughout the execution of this laboratory task, we encountered difficulties pertaining to BGP AS assignments and redistribution. This experience significantly enhanced my understanding and proficiency in configuring a rudimentary iBGP setup.

Close-up of a letterhead

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