

# Practical 5: BGP Routing Topology

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## I. INTRODUCTION

Aim of this practical is to create BGP topology in GNS3 according to [this](#) link.

## II. CONFIGURATION

Below steps are to be followed in order to initially configure IP address of router. Here Below are the configuration taken for configuring routers.

Comparative analysis

Router	linked to	Interface	IP address	Subnet
R1 (AS 100)	R2	Ethernet 1/1	192.168.12.1	255.255.255.0
	R3	Ethernet 1/2	192.168.13.1	255.255.255.0
R2 (AS 200)	R1	Ethernet 1/1	192.168.12.2	255.255.255.0
R3 (AS 300)	R1	Ethernet 1/2	192.168.13.3	255.255.255.0

### I. Initial Configuration

#### I.1 Display interface status in brief

```
R1#sh ip int br
```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	unassigned	YES	unset	administratively down	down
Ethernet1/0	unassigned	YES	unset	administratively down	down
Ethernet1/1	192.168.12.1	YES	manual	up	up
Ethernet1/2	192.168.13.1	YES	manual	up	up
Ethernet1/3	unassigned	YES	unset	administratively down	down
Loopback0	unassigned	YES	unset	up	up
Loopback1	unassigned	YES	unset	up	up
Loopback2	unassigned	YES	unset	up	up

#### I.2 Enter to configuration mode

```
R1#conf t
```

### **I.3 Select interface to work on**

```
R1(config)#int ethernet1/0
```

### **I.4 Set interface 'up' - make active**

```
R1(config-if)#no shut
```

### **I.5 Configure IP address**

```
R1(config-if)#ip address 192.168.12.1 255.255.255.0
```

### **I.6 Setup loopback**

```
R1(config-if)#int loop 0
```

## **II. BGP Configuration of R1**

```
R1(config)#router bgp 100
R1(config-router)#neighbor 192.168.12.2 remote-as 200
R1(config-router)#
*Nov  4 15:28:21.719: %BGP-5-ADJCHANGE: neighbor 192.168.12.1 Up
R1(config-router)#neighbor 192.168.13.3 remote-as 300
```

### **II.1 Exiting configuration**

```
R1(config-if)#end
```

### **II.2 Write configuration**

```
R1#wr
```

## **III. Configuration of R2 and R3**

Similarly we will set up router R2 and router R3 with initial configuration following above steps and configure initial configuration.

### III.1 R2 IP configuration

```
R2#sh ip int br
Interface                IP-Address      OK? Method Status          Protocol
FastEthernet0/0          unassigned      YES NVRAM   administratively down down
FastEthernet0/1          unassigned      YES NVRAM   administratively down down
Ethernet1/0              unassigned      YES NVRAM   administratively down down
Ethernet1/1              192.168.12.2    YES NVRAM   up              up
Ethernet1/2              unassigned      YES NVRAM   administratively down down
Ethernet1/3              unassigned      YES NVRAM   administratively down down
Loopback0                2.2.2.2         YES NVRAM   up              up
```

### III.2 R3 IP configuration

```
R3#sh ip int br
Interface                IP-Address      OK? Method Status          Protocol
FastEthernet0/0          unassigned      YES NVRAM   administratively down down
FastEthernet0/1          unassigned      YES NVRAM   administratively down down
Ethernet1/0              unassigned      YES NVRAM   administratively down down
Ethernet1/1              unassigned      YES NVRAM   administratively down down
Ethernet1/2              192.168.13.3    YES NVRAM   up              up
Ethernet1/3              unassigned      YES NVRAM   administratively down down
Loopback0                3.3.3.3         YES NVRAM   up              up
```

## IV. BGP Configuration

### IV.1 R2

```
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router bgp 200
R2(config-router)#neighbor 192.168.12.1 remote-as 100
R2(config-router)#end
R2#show ip
*Nov  4 18:45:24.647: %SYS-5-CONFIG_I: Configured from console by console
R2#show ip bgp
```

### IV.2 R3

```
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router bgp 300
R3(config-router)#neighbor 192.168.13.1 remote-as 100
```

```
R3(config-router)#end
R3#
*Nov  4 18:45:06.015: %SYS-5-CONFIG_I: Configured from console by console
R3#show ip bgp
```

### III. RESULT

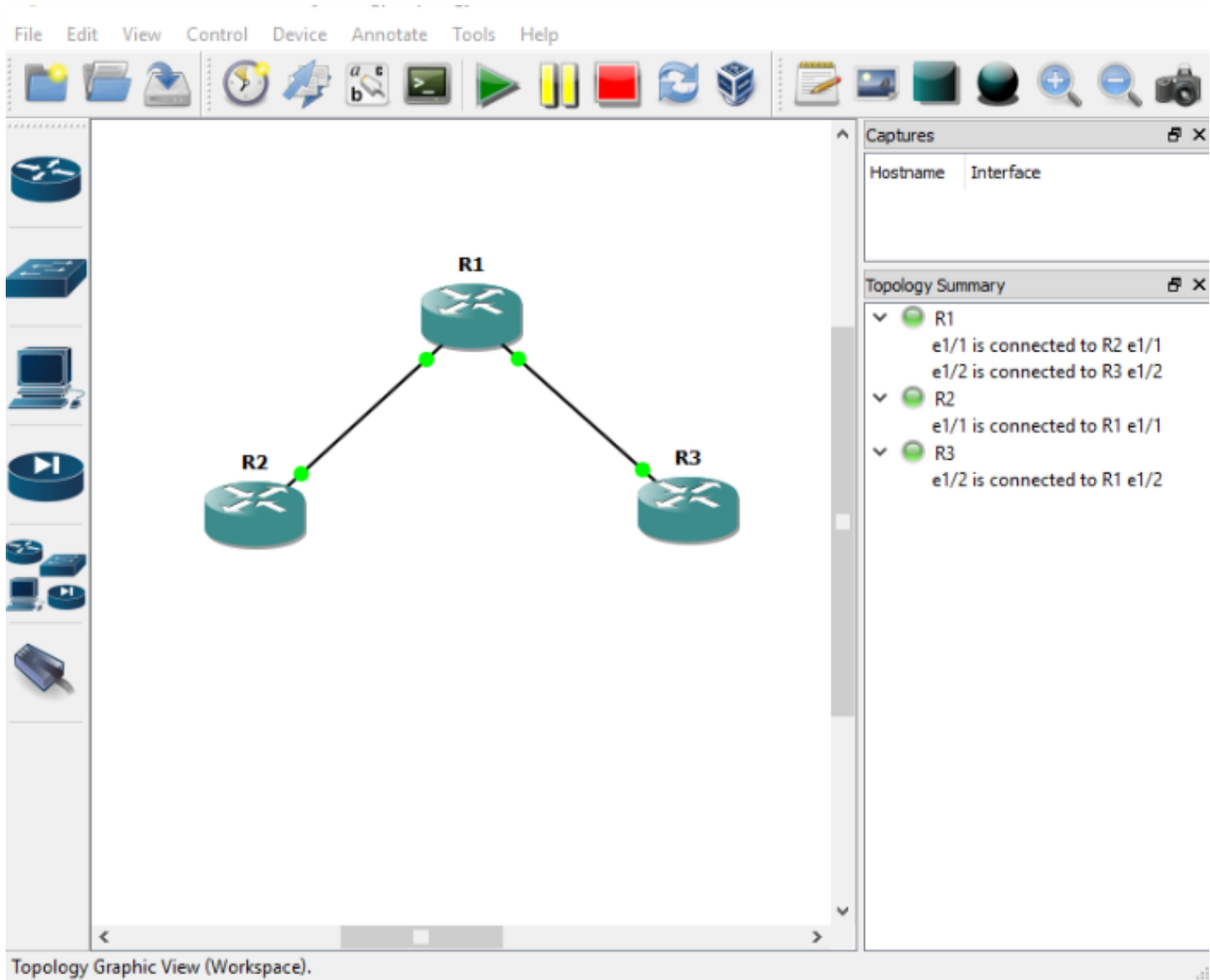


Figure 1: Topology Summary

The screenshot shows a SuperPutty terminal window titled "SuperPutty - R1". The terminal displays the following commands and output:

```

Loopback2                unassigned      YES unset  up          up
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#do ping
Protocol [ip]: 192.168.12.1
% Unknown protocol - "192.168.12.1", type "ping ?" for help
R1(config)#do ping 192.168.12.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.12.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/9/16 ms
R1(config)#do ping 192.168.13.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.13.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/12 ms
R1(config)#router bgp 100
R1(config-router)#neighbor 192.168.12.2 remote-as 200
R1(config-router)#neighbor 192.168.13.3 remote-as 300
R1(config-router)#end
R1#show ip
*Nov  4 18:45:31.175: %SYS-5-CONFIG_I: Configured from console by console
R1#show ip bgp
BGP table version is 3, local router ID is 192.168.13.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

   Network          Next Hop           Metric LocPrf Weight Path
   *> 2.2.2.0/24      192.168.12.2         0             0 200 i
   *> 3.3.3.0/28      192.168.13.3         0             0 300 i
R1#wr
Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...
[OK]
R1#

```

Figure 2: R1: BGP route status

```
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router bgp 200
R2(config-router)#neighbor 192.168.12.1 remote-as 100
R2(config-router)#end
R2#show ip
*Nov  4 18:45:24.647: %SYS-5-CONFIG_I: Configured from console by console
R2#show ip bgp
BGP table version is 3, local router ID is 2.2.2.2
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

   Network          Next Hop           Metric LocPrf Weight Path
*>  2.2.2.0/24       0.0.0.0              0         32768 i
*>  3.3.3.0/28       192.168.12.1         0         100 300 i
R2#wr
Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...
[OK]
R2#
```

Figure 3: R2: BGP route status

```
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router bgp 300
R3(config-router)#neighbor 192.168.13.1 remote-as 100
R3(config-router)#end
R3#
*Nov  4 18:45:06.015: %SYS-5-CONFIG_I: Configured from console by console
R3#show ip bgp
BGP table version is 3, 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, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

   Network          Next Hop           Metric LocPrf Weight Path
*>  2.2.2.0/24       192.168.13.1         0         100 200 i
*>  3.3.3.0/28       0.0.0.0              0         32768 i
R3#wr
Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...
[OK]
R3#
```

Figure 4: R3: BGP route status