Laporan Praktikum Routing Dinamis BGP
Jaringan Komputer Lanjut

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Border Gateway Protocol (BGP) merupakan salah satu jenis routing protokol yang ada di dunia komunikasi data. Sebagai sebuah routing protokol, BGP memiliki kemampuan melakukan pengumupulan rute, pertukaran rute dan menentukan rute terbaik menuju ke sebuah lokasi dalam jaringan. Routing protokol pasti dilengkapi dengan algoritma yang cerdas dalam mencari jalan terbaik. Namun yang membedakan BGP dengan routing protokol lain seperti OSPF dan RIP adalah BGP termasuk dalam kategori routing protokol jenis Exterior Gateway Protokol (EGP).

EGP merupakan jenis routing protokol yang memiliki kemampuan melakukan pertukaran rute dari dank e luar jaringan local sebuah organisasi atau kelompok tertentu. Organisasi atau kelompok diluar organisasi pribadi disebut dengan istilah autonomous system (AS), maksudnya rute-rute yang dimiliki oleh sebuah AS dapat juga dimiliki oleh AS yang lain yang berbeda kepentingan dan otoritas. Begitu juga dengan AS tersebut dapat memiliki rute-rute yang dimiliki organisasi lain.

Keuntungannya adalah sebuah organisasi bisa dikenal oleh organisasi lainnya yang kita kirimi rute. Setelah dikenali rute-rute menuju lokasi kita, banyak orang yang dapat berkomunikasi dengan kita. Selain itu, kita juga menerima rute-rute menuju ke organisasi lainnya. Sehingga kita juga dapat membangun komunikasi dengan para pengguna yang tergabung di organisasi lain. Dengan demikian, komunikasi dapat semakin luas menyebar.

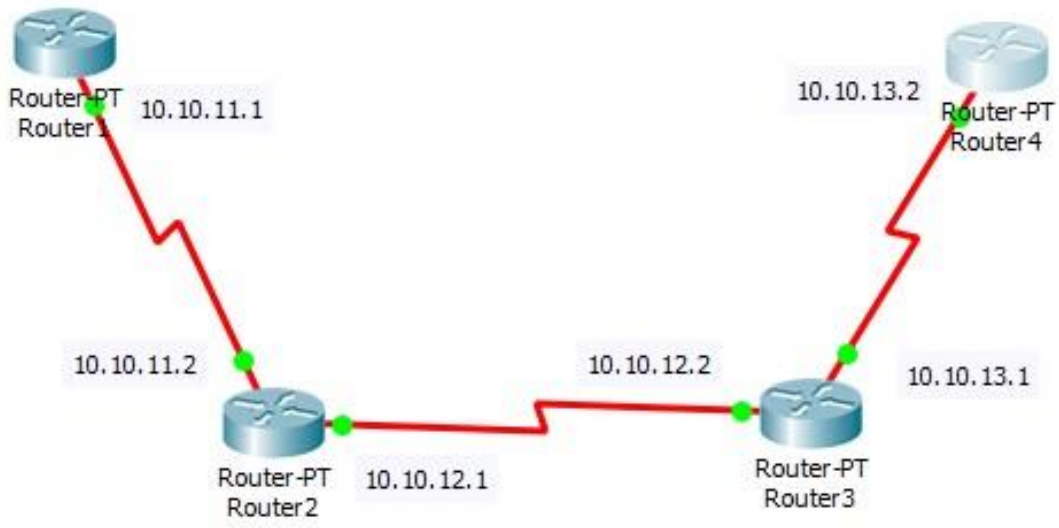
Autonomous System (AS) bagaikan sebuah perusahaan tempat kita bekerja. Sebuah perusahaan memiliki peraturan sendiri, memiliki struktur organisasi sendiri, memiliki produknya sendiri, memiliki gyaanya sendiri dalam berbisnis dan memiliki privasinya sendiri. Cisco sytem mendefinisikan pengertian AS adalah sekumpulan perangkat jaringan yang berada dibawah administrasi dan strategi routing yang sama.

LANGKAH-LANGKAH PERCOBAAN

1. Buatlah Jaringan Dengan topologi seperti Gambar dibawah

a. Sebelum dikonfigurasi :

b. Setelah dikonfigurasi :



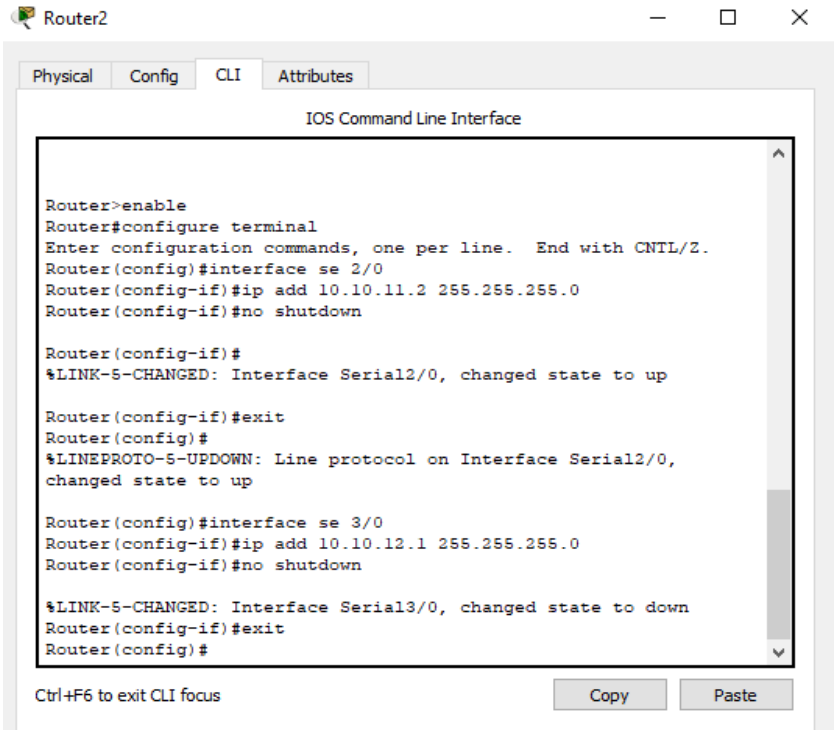
2. Konfigurasi Router

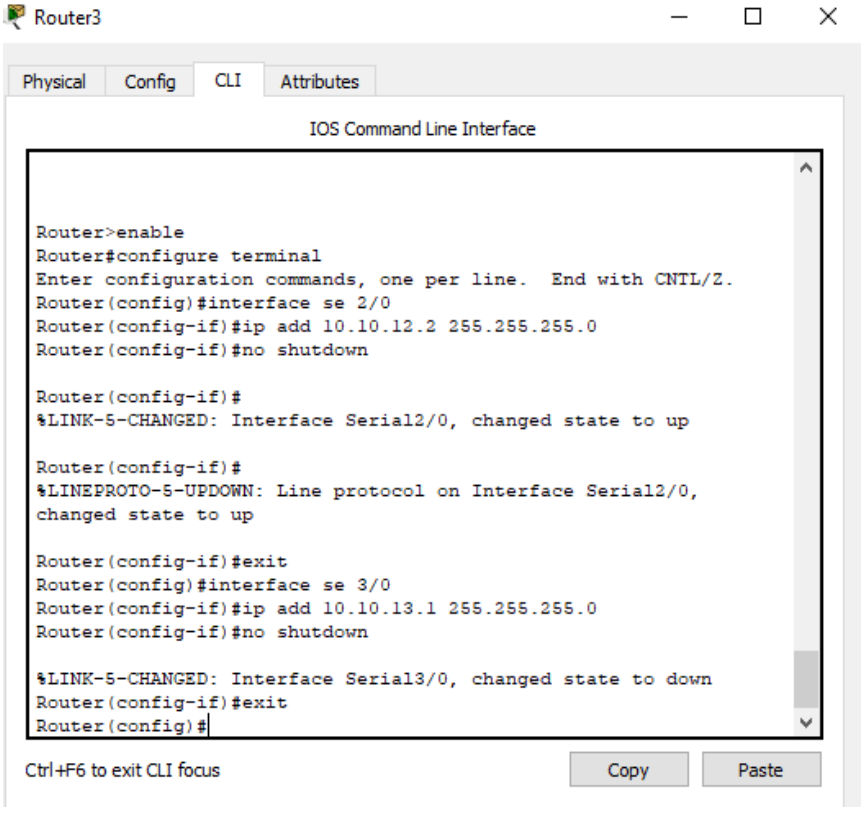
Router1

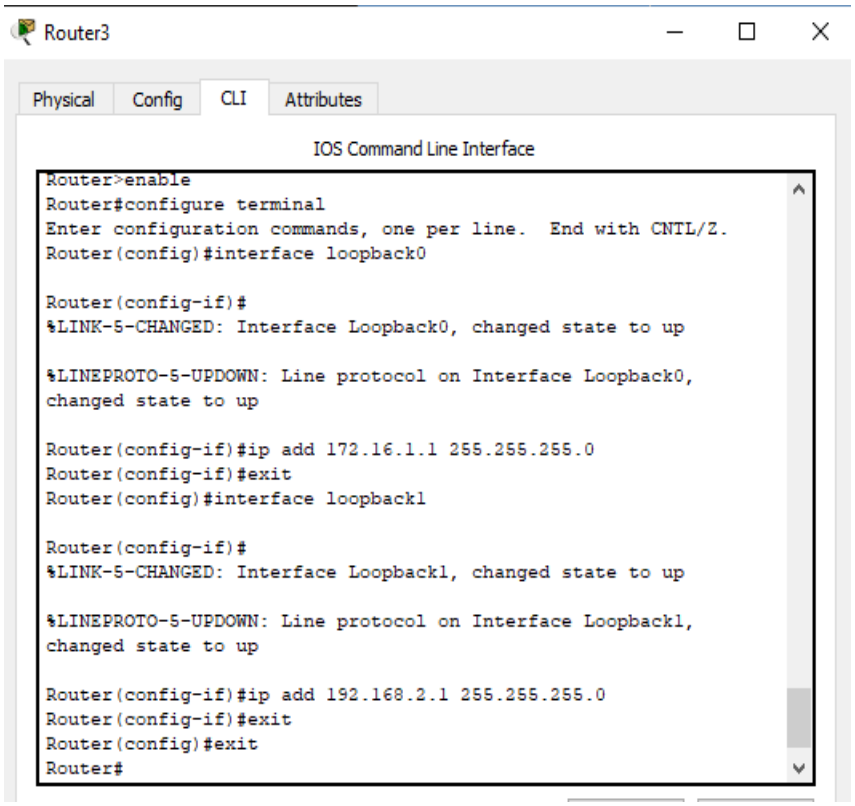
Physical | Config | CLI | Attributes

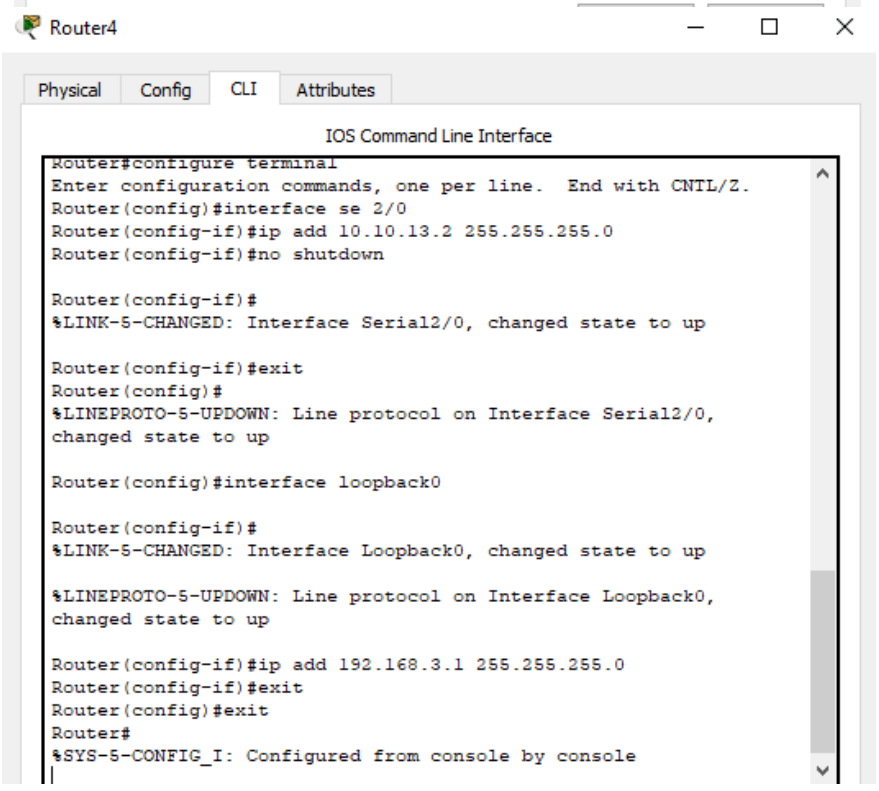
IOS Command Line Interface

```
Router#clear
% Incomplete command.
Router#enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Serial 2/0
Router(config-if)#ip add 10.10.11.1 255.255.255.0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#exit
Router(config)#interface loopback0

Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0,
changed state to up

Router(config-if)#ip add 12.0.1.1 255.255.255.0
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```


Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface se 2/0
Router(config-if)#ip add 10.10.11.2 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
Router(config-if)#exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0,
changed state to up
Router(config)#interface se 3/0
Router(config-if)#ip add 10.10.12.1 255.255.255.0
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#exit
Router(config)#
Ctrl+F6 to exit CLI focus
Copy
Paste


Router3
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface se 2/0
Router(config-if)#ip add 10.10.12.2 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0,
changed state to up
Router(config-if)#exit
Router(config)#interface se 3/0
Router(config-if)#ip add 10.10.13.1 255.255.255.0
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#exit
Router(config)#
Ctrl+F6 to exit CLI focus
Copy
Paste





3. Konfigurasi bgp

Router1

Physical | Config | CLI | Attributes

IOS Command Line Interface

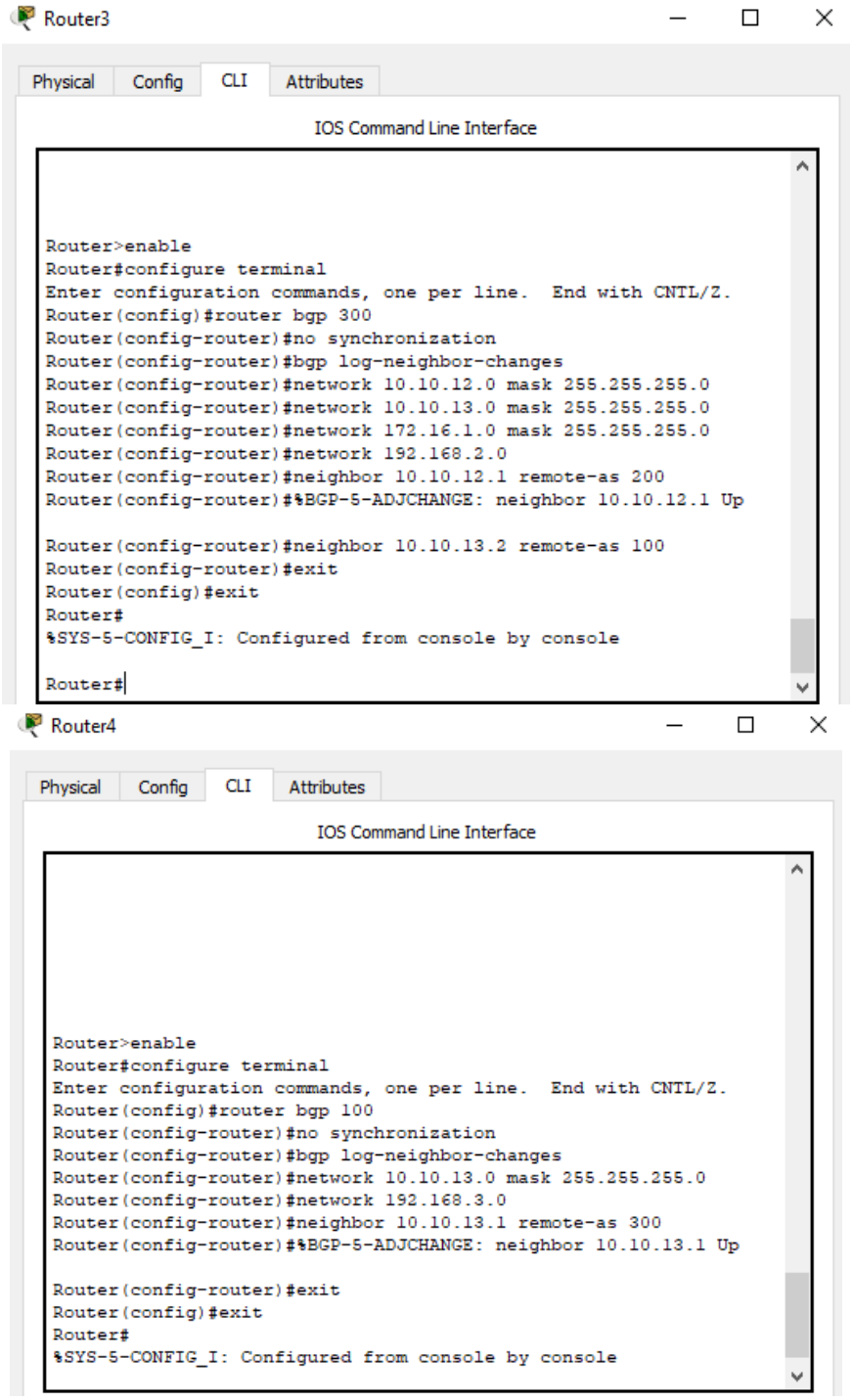
```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router bgp 100
Router(config-router)#no synchronization
Router(config-router)#bgp log-neighbor-changes
Router(config-router)#nerwork 10.10.11.0 mask 255.255.255.0
                      ^
% Invalid input detected at '^' marker.

Router(config-router)#network 10.10.11.0 mask 255.255.255.0
Router(config-router)#network 12.0.1.0 mask 255.255.255.0
Router(config-router)#neighbor 10.10.11.2 remote-as 200
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
```

Router2

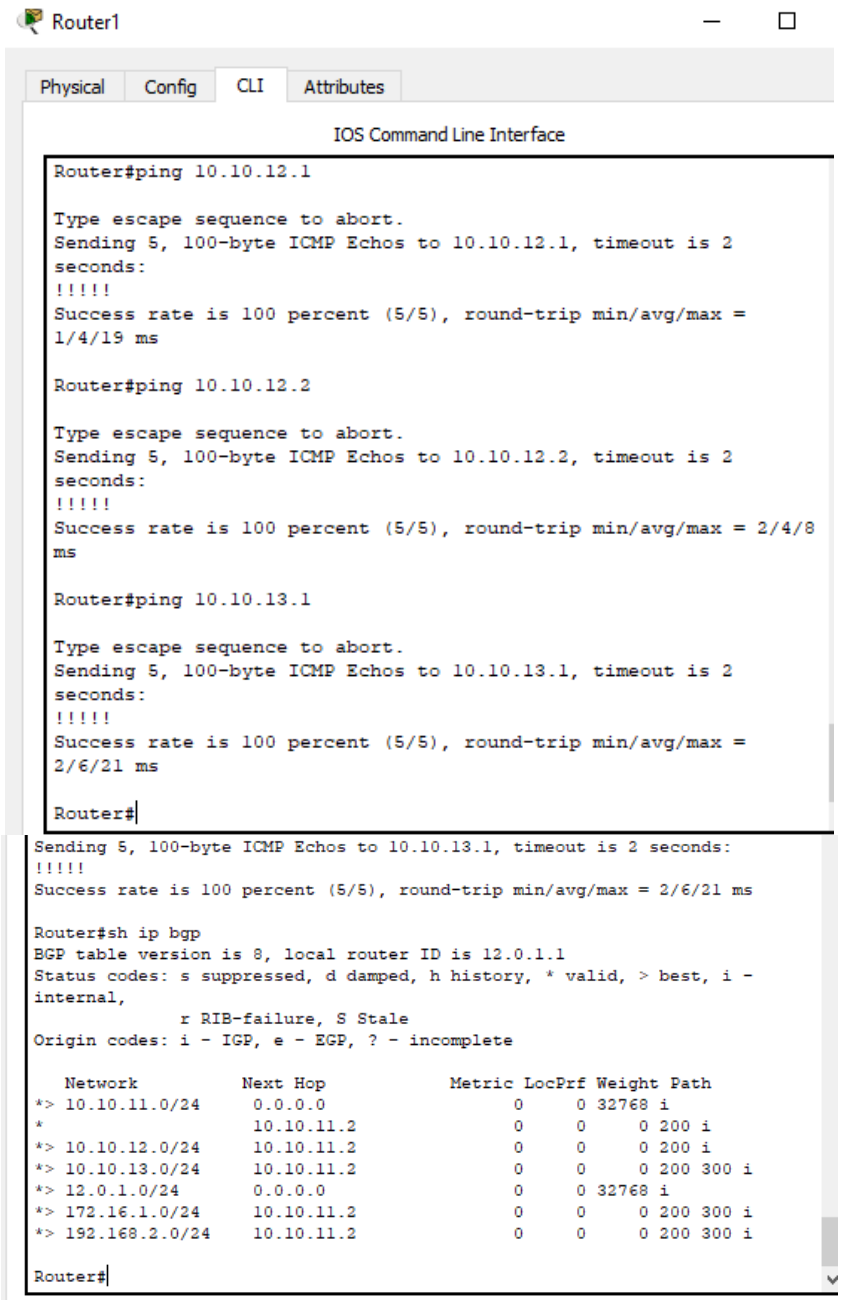
Physical | Config | CLI | Attributes

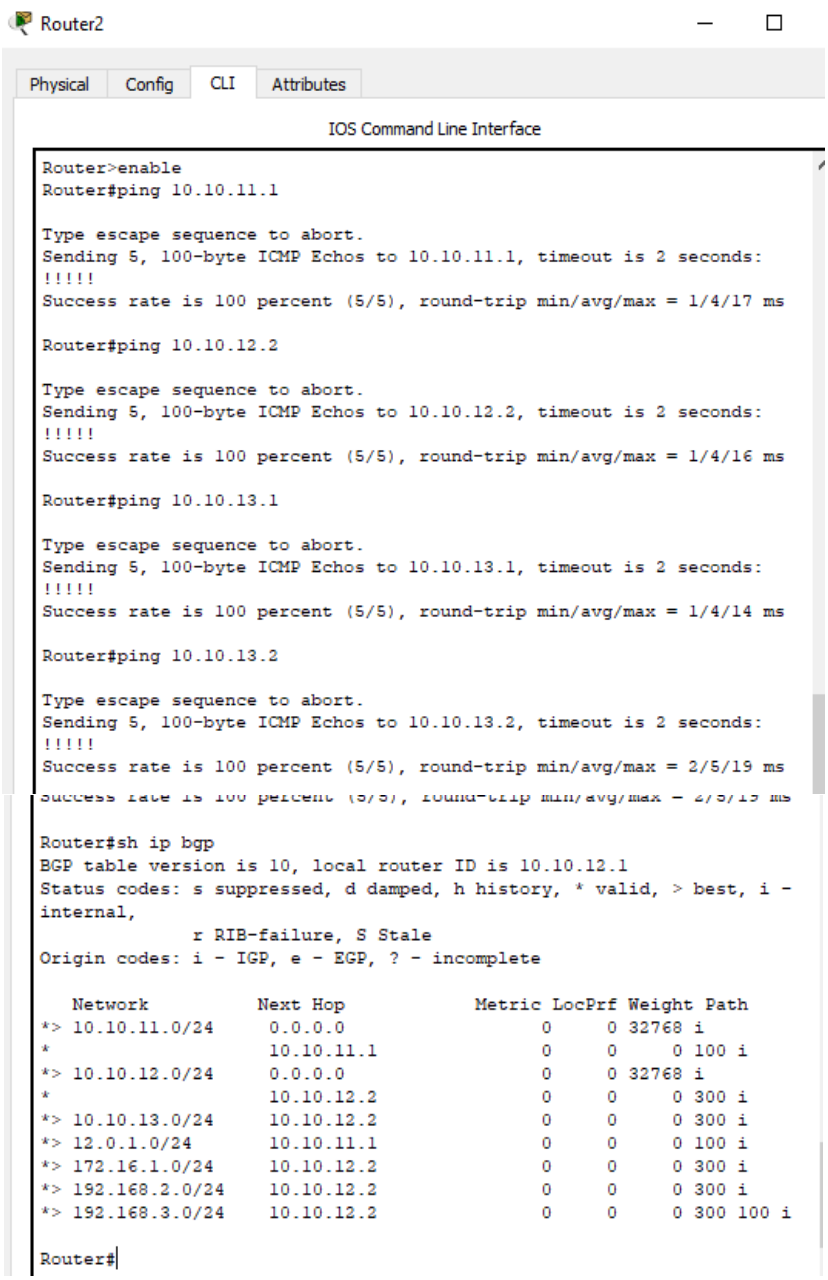
IOS Command Line Interface

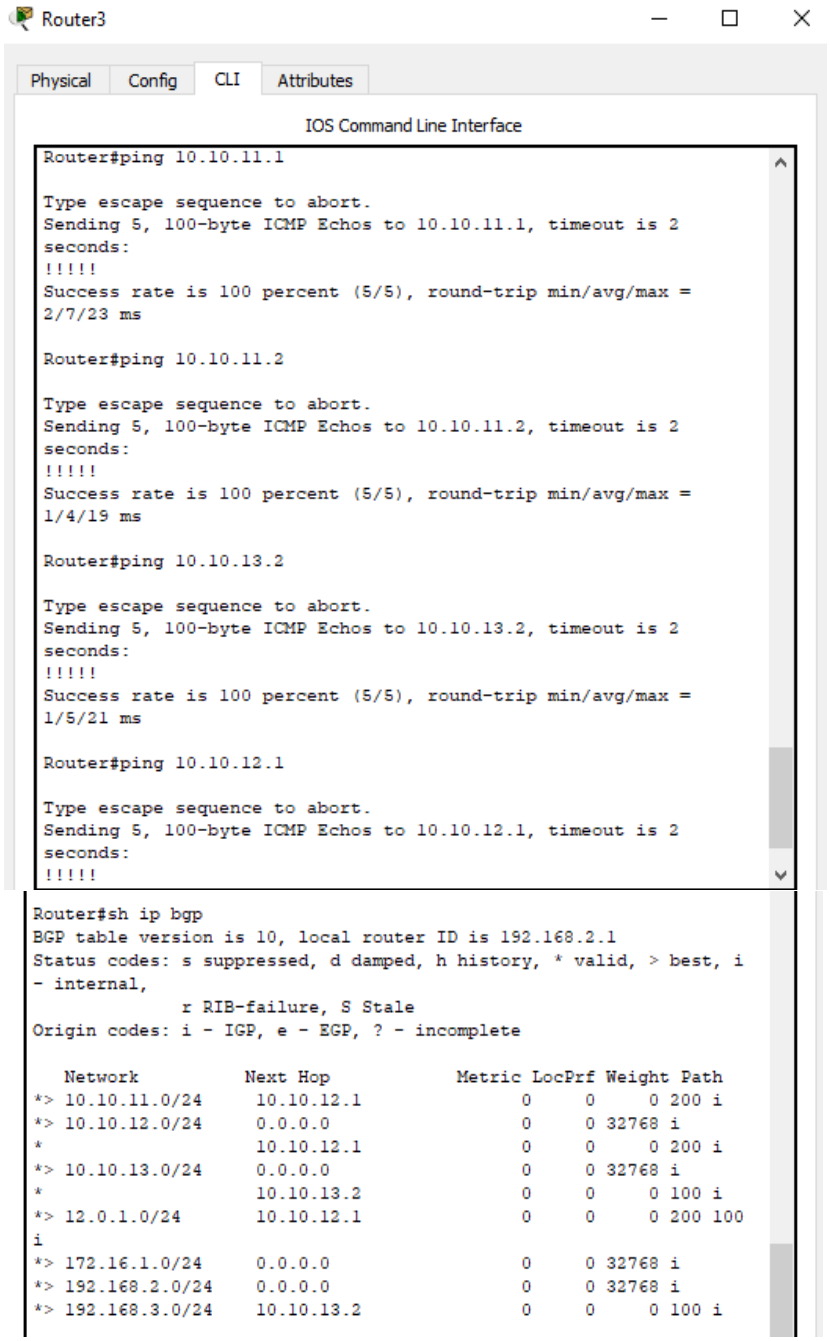
```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router bgp 200
Router(config-router)#no synchronization
Router(config-router)#bgp log-neighbor-changes
Router(config-router)#network 10.10.11.0 mask 255.255.255.0
Router(config-router)#network 10.10.12.0 mask 255.255.255.0
Router(config-router)#network 192.168.0.0
Router(config-router)#network 192.168.1.0
Router(config-router)#neighbor 10.10.11.1 remote-as 100
Router(config-router)#%BGP-5-ADJCHANGE: neighbor 10.10.11.1 Up

Router(config-router)#neighbor 10.10.12.2 remote-as 300
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
```



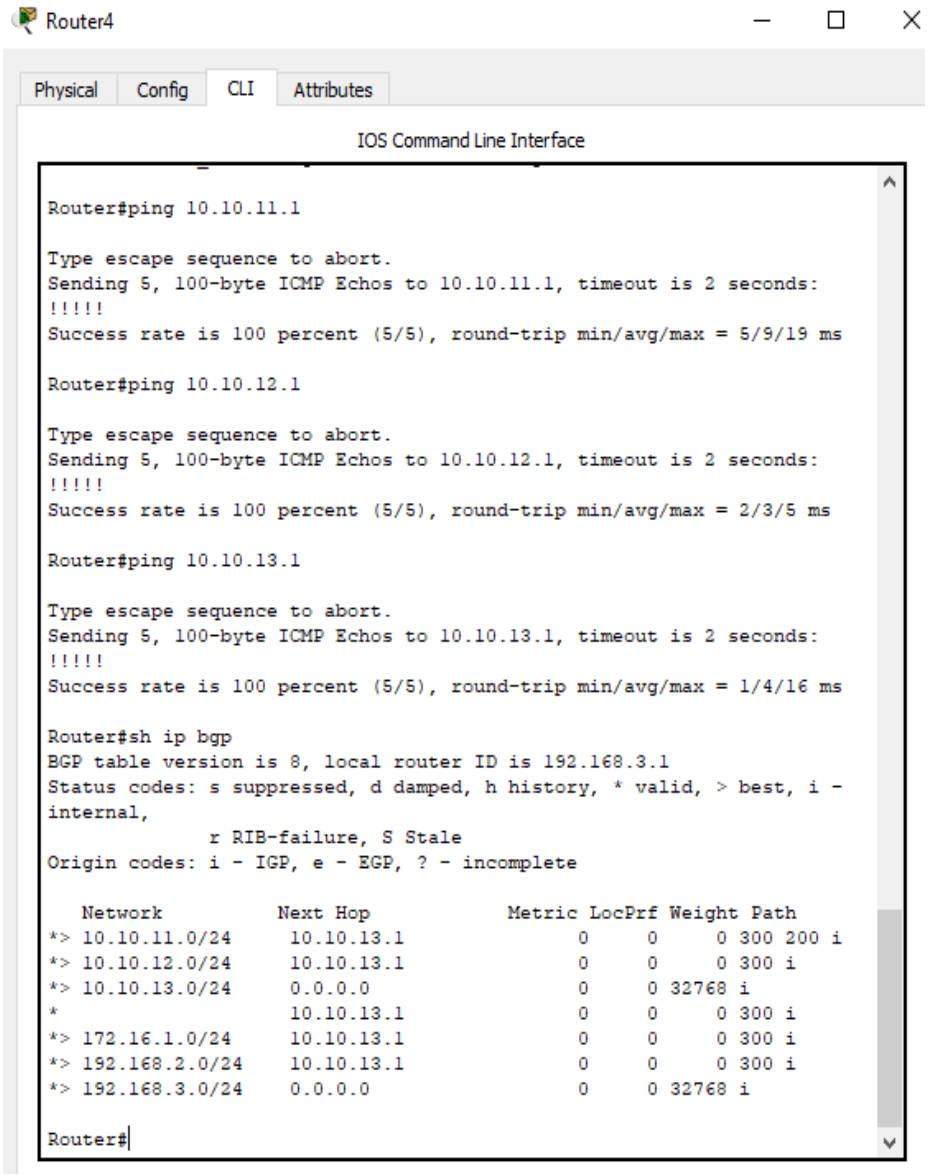
4. Test koneksi dari masing masing router


Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router#ping 10.10.12.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.12.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/19 ms
Router#ping 10.10.12.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.12.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/4/8 ms
Router#ping 10.10.13.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.13.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/6/21 ms
Router#
Sending 5, 100-byte ICMP Echos to 10.10.13.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/6/21 ms
Router#sh ip bgp
BGP table version is 8, local router ID is 12.0.1.1
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
*> 10.10.11.0/24 0.0.0.0 0 0 32768 i
* 10.10.11.2 0 0 0 200 i
*> 10.10.12.0/24 10.10.11.2 0 0 0 200 i
*> 10.10.13.0/24 10.10.11.2 0 0 0 200 300 i
*> 12.0.1.0/24 0.0.0.0 0 0 32768 i
*> 172.16.1.0/24 10.10.11.2 0 0 0 200 300 i
*> 192.168.2.0/24 10.10.11.2 0 0 0 200 300 i
Router#


Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>enable
Router#ping 10.10.11.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.11.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/17 ms
Router#ping 10.10.12.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.12.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/16 ms
Router#ping 10.10.13.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.13.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/14 ms
Router#ping 10.10.13.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.13.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/5/19 ms
Router#sh ip bgp
BGP table version is 10, local router ID is 10.10.12.1
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
*> 10.10.11.0/24 0.0.0.0 0 0 32768 i
* 10.10.11.1 0 0 0 100 i
*> 10.10.12.0/24 0.0.0.0 0 0 32768 i
* 10.10.12.2 0 0 0 300 i
*> 10.10.13.0/24 10.10.12.2 0 0 0 300 i
*> 12.0.1.0/24 10.10.11.1 0 0 0 100 i
*> 172.16.1.0/24 10.10.12.2 0 0 0 300 i
*> 192.168.2.0/24 10.10.12.2 0 0 0 300 i
*> 192.168.3.0/24 10.10.12.2 0 0 0 300 100 i
Router#




```
Router#sh ip bgp
BGP table version is 10, local router ID is 192.168.2.1
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
*> 10.10.11.0/24     10.10.12.1               0      0      0 200 i
*> 10.10.12.0/24     0.0.0.0                  0      0 32768 i
*                    10.10.12.1               0      0      0 200 i
*> 10.10.13.0/24     0.0.0.0                  0      0 32768 i
*                    10.10.13.2               0      0      0 100 i
*> 12.0.1.0/24       10.10.12.1               0      0      0 200 100
i
*> 172.16.1.0/24     0.0.0.0                  0      0 32768 i
*> 192.168.2.0/24    0.0.0.0                  0      0 32768 i
*> 192.168.3.0/24    10.10.13.2               0      0      0 100 i
```


Router4
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router#ping 10.10.11.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.11.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 5/9/19 ms
Router#ping 10.10.12.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.12.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/3/5 ms
Router#ping 10.10.13.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.13.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/16 ms
Router#sh ip bgp
BGP table version is 8, local router ID is 192.168.3.1
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
*> 10.10.11.0/24 10.10.13.1 0 0 0 300 200 i
*> 10.10.12.0/24 10.10.13.1 0 0 0 300 i
*> 10.10.13.0/24 0.0.0.0 0 0 32768 i
* 10.10.13.1 0 0 0 300 i
*> 172.16.1.0/24 10.10.13.1 0 0 0 300 i
*> 192.168.2.0/24 10.10.13.1 0 0 0 300 i
*> 192.168.3.0/24 0.0.0.0 0 0 32768 i
Router#