Nomer 4 (Full Konfig)

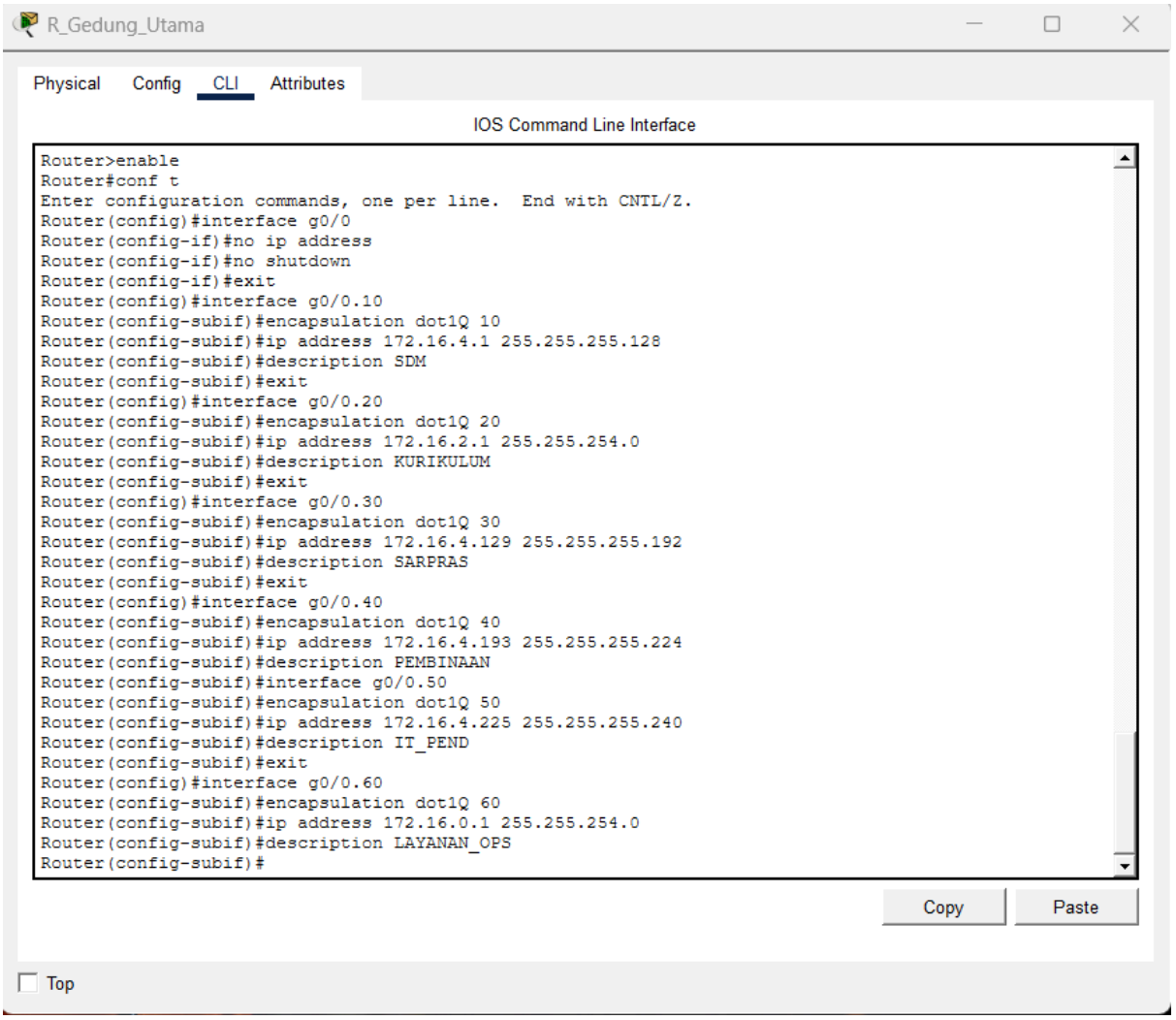
IP STATIS & DHCP

R GEDUNG UTAMA

Interface + Router-on-a-Stick

```
enable
conf t

interface g0/0
 no ip address
 no shutdown

interface g0/0.10
 encapsulation dot1Q 10
 ip address 172.16.4.1 255.255.255.128
 description SDM

interface g0/0.20
 encapsulation dot1Q 20
 ip address 172.16.2.1 255.255.254.0
 description KURIKULUM

interface g0/0.30
 encapsulation dot1Q 30
 ip address 172.16.4.129 255.255.255.192
 description SARPRAS

interface g0/0.40
 encapsulation dot1Q 40
 ip address 172.16.4.193 255.255.255.224
 description PEMBINAAN

interface g0/0.50
 encapsulation dot1Q 50
 ip address 172.16.4.225 255.255.255.240
 description IT_PEND

interface g0/0.60
 encapsulation dot1Q 60
 ip address 172.16.0.1 255.255.254.0
```

description LAYANAN_OPS



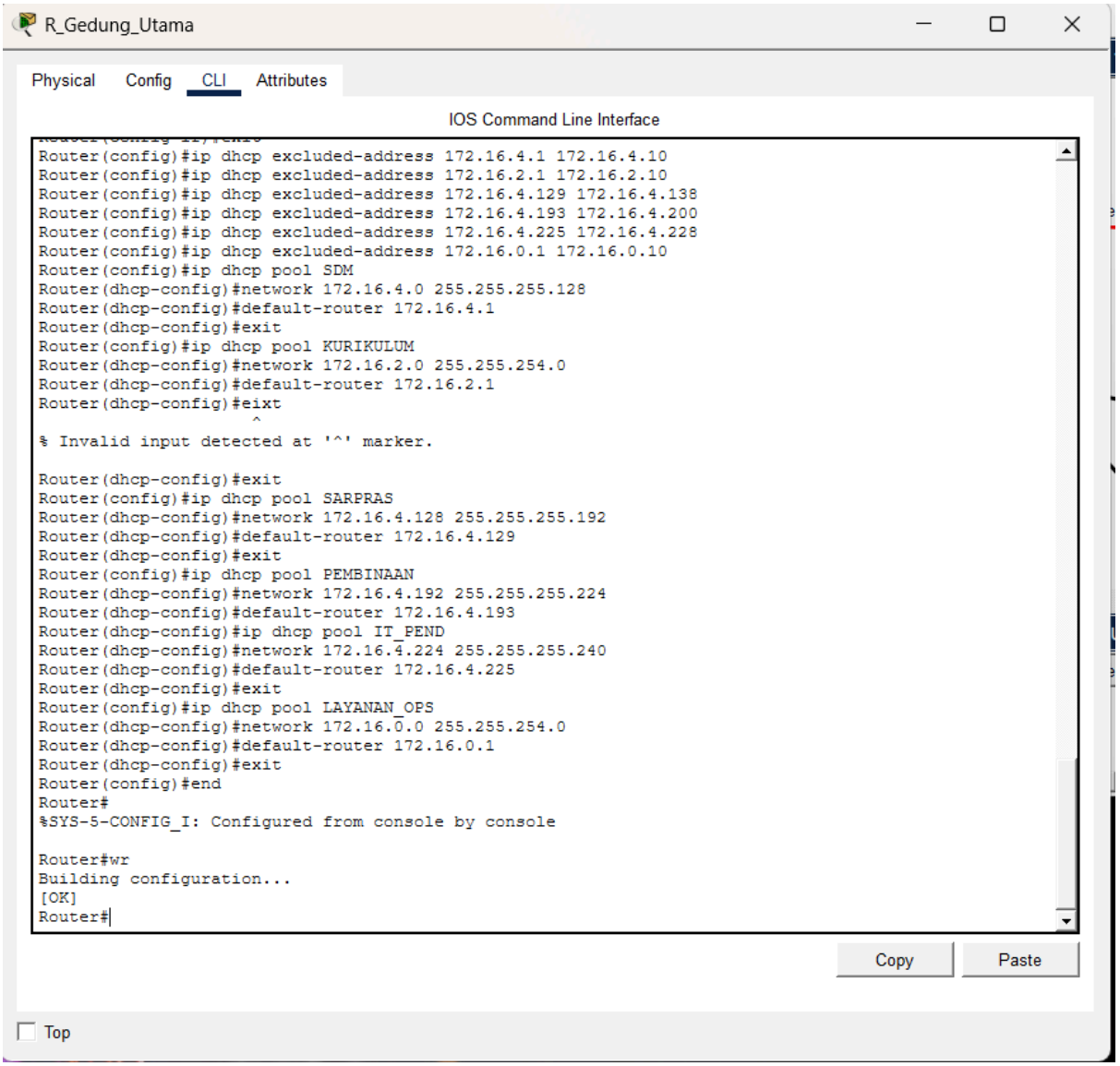
Link ke ARA Tech

interface s0/3/0
 ip address 192.168.0.2 255.255.255.252
 no shutdown

```
Router(config)#interface s0/3/0
Router(config-if)#ip address 192.168.0.2 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
```

DHCP SERVER – GEDUNG UTAMA

```
ip dhcp excluded-address 172.16.4.1 172.16.4.10
ip dhcp excluded-address 172.16.2.1 172.16.2.10
ip dhcp excluded-address 172.16.4.129 172.16.4.138
ip dhcp excluded-address 172.16.4.193 172.16.4.200
ip dhcp excluded-address 172.16.4.225 172.16.4.228
ip dhcp excluded-address 172.16.0.1 172.16.0.10

ip dhcp pool SDM
 network 172.16.4.0 255.255.255.128
 default-router 172.16.4.1

ip dhcp pool KURIKULUM
 network 172.16.2.0 255.255.254.0
 default-router 172.16.2.1

ip dhcp pool SARPRAS
 network 172.16.4.128 255.255.255.192
 default-router 172.16.4.129

ip dhcp pool PEMBINAAN
 network 172.16.4.192 255.255.255.224
 default-router 172.16.4.193

ip dhcp pool IT_PEND
 network 172.16.4.224 255.255.255.240
 default-router 172.16.4.225

ip dhcp pool LAYANAN_OPS
 network 172.16.0.0 255.255.254.0
 default-router 172.16.0.1
```



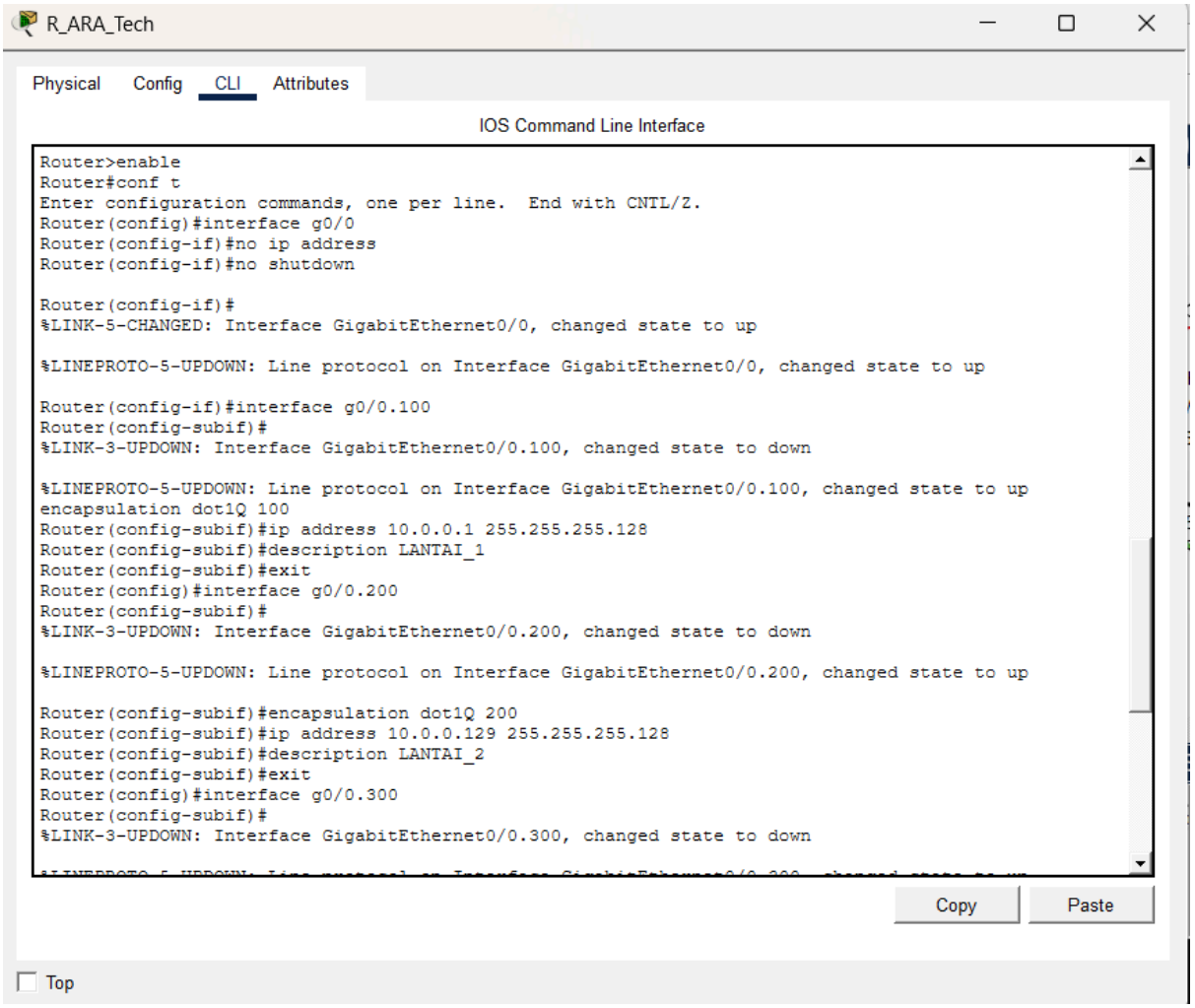
R ARA TECH

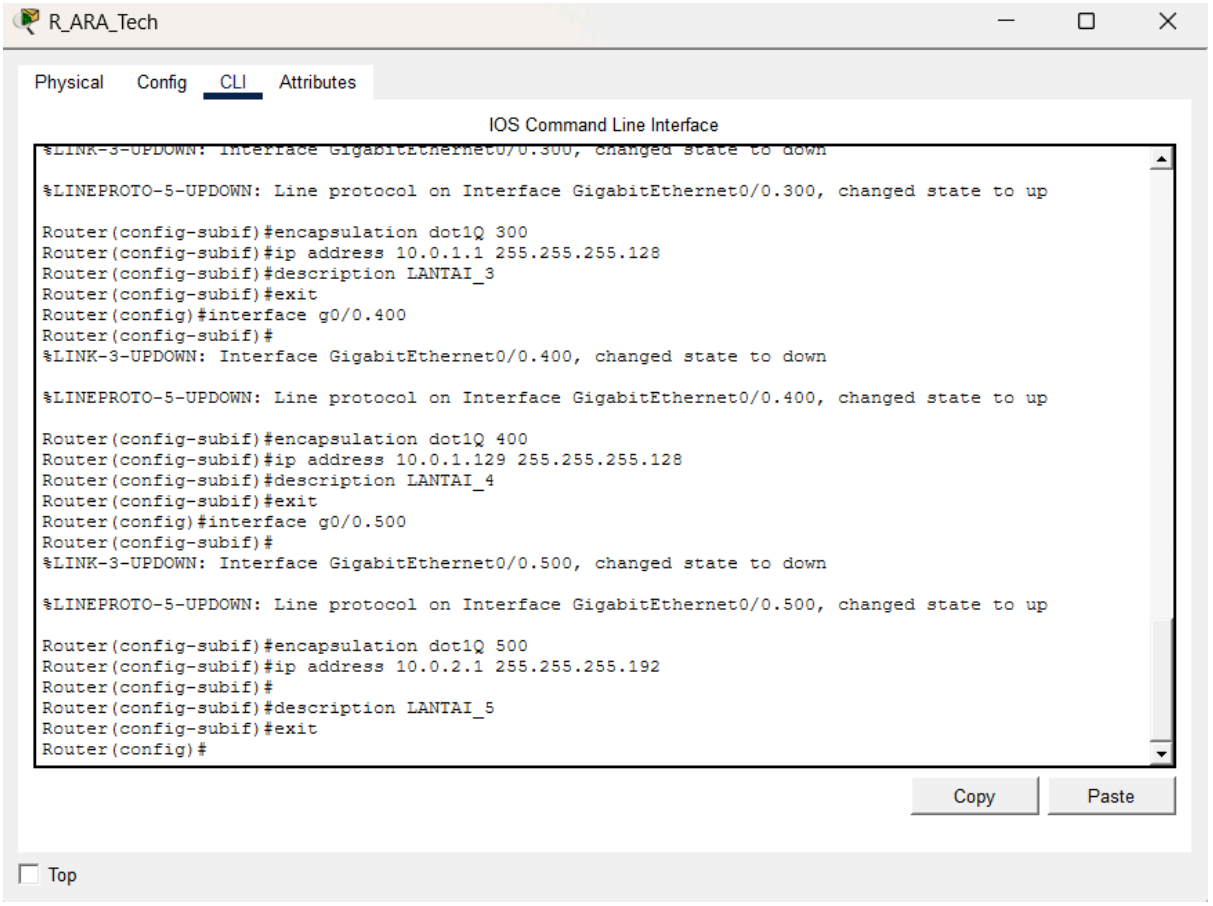
Interface VLAN Lantai

interface g0/0
 no ip address
 no shutdown

interface g0/0.100
 encapsulation dot1Q 100
 ip address 10.0.0.1 255.255.255.128
 description LANTAI_1

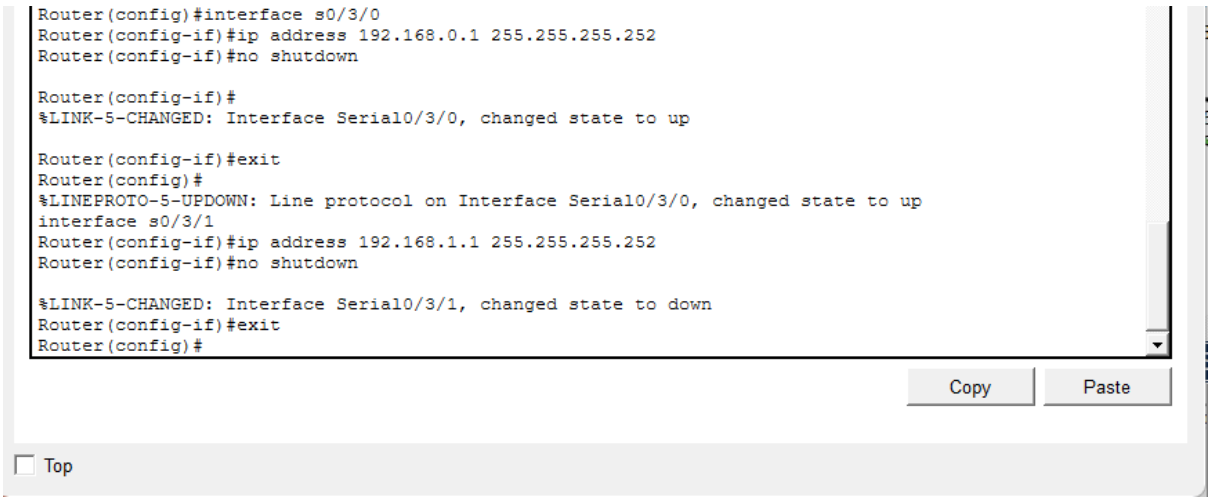
```
interface g0/0.200
 encapsulation dot1Q 200
 ip address 10.0.0.129 255.255.255.128
 description LANTAI_2

interface g0/0.300
 encapsulation dot1Q 300
 ip address 10.0.1.1 255.255.255.128
 description LANTAI_3

interface g0/0.400
 encapsulation dot1Q 400
 ip address 10.0.1.129 255.255.255.128
 description LANTAI_4

interface g0/0.500
 encapsulation dot1Q 500
 ip address 10.0.2.1 255.255.255.192
 description LANTAI_5
```





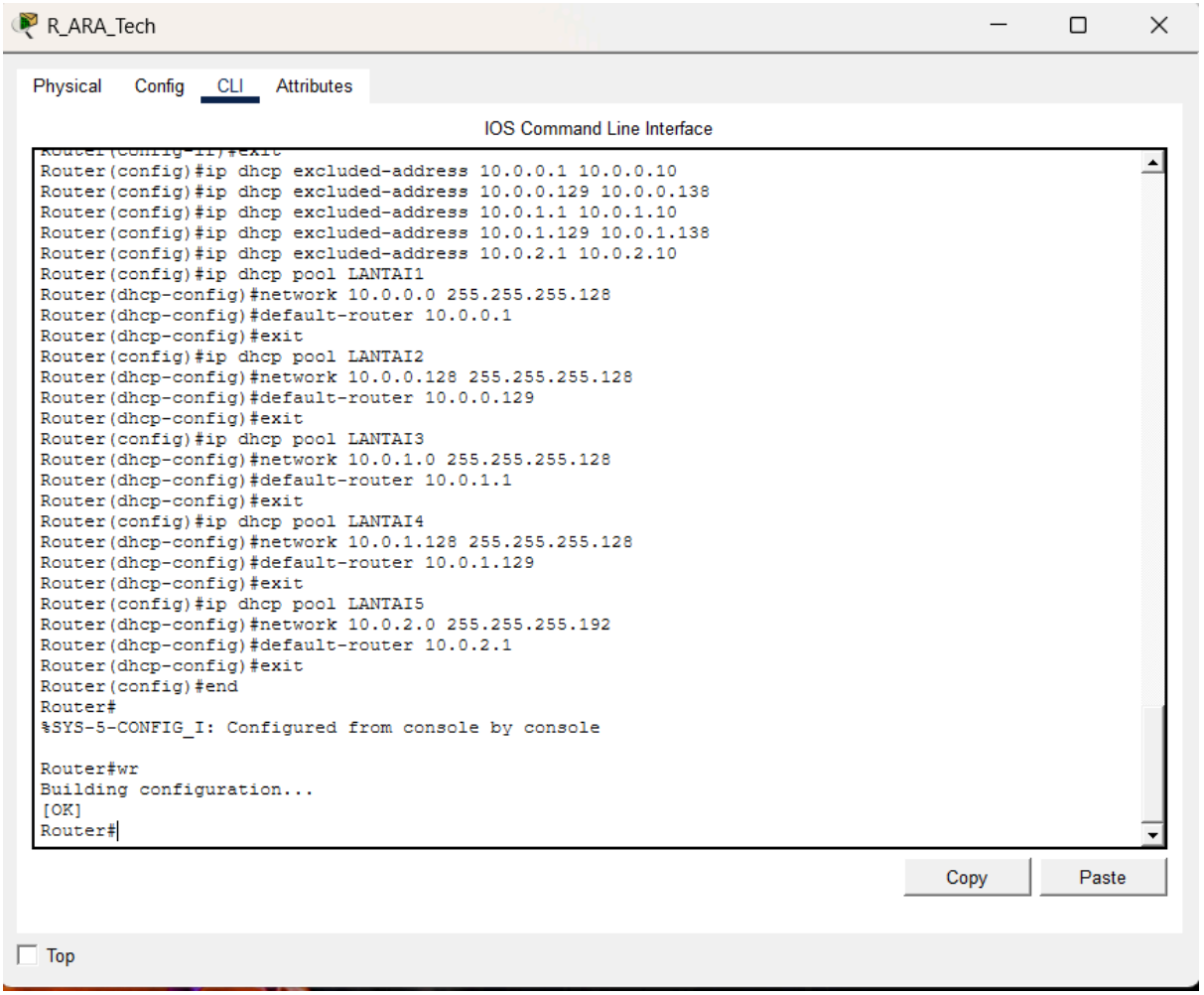
Link Antar Gedung

```
interface s0/3/0
 ip address 192.168.0.1 255.255.255.252
 no shutdown

interface s0/3/1
 ip address 192.168.1.1 255.255.255.252
 no shutdown
```



DHCP SERVER – ARA TECH

```
ip dhcp excluded-address 10.0.0.1 10.0.0.10
ip dhcp excluded-address 10.0.0.129 10.0.0.138
ip dhcp excluded-address 10.0.1.1 10.0.1.10
ip dhcp excluded-address 10.0.1.129 10.0.1.138
ip dhcp excluded-address 10.0.2.1 10.0.2.10

ip dhcp pool LANTAI1
 network 10.0.0.0 255.255.255.128
 default-router 10.0.0.1

ip dhcp pool LANTAI2
 network 10.0.0.128 255.255.255.128
 default-router 10.0.0.129

ip dhcp pool LANTAI3
 network 10.0.1.0 255.255.255.128
 default-router 10.0.1.1

ip dhcp pool LANTAI4
 network 10.0.1.128 255.255.255.128
 default-router 10.0.1.129

ip dhcp pool LANTAI5
 network 10.0.2.0 255.255.255.192
 default-router 10.0.2.1
```



R KANTOR CABANG

interface g0/0
 no ip address
 no shutdown

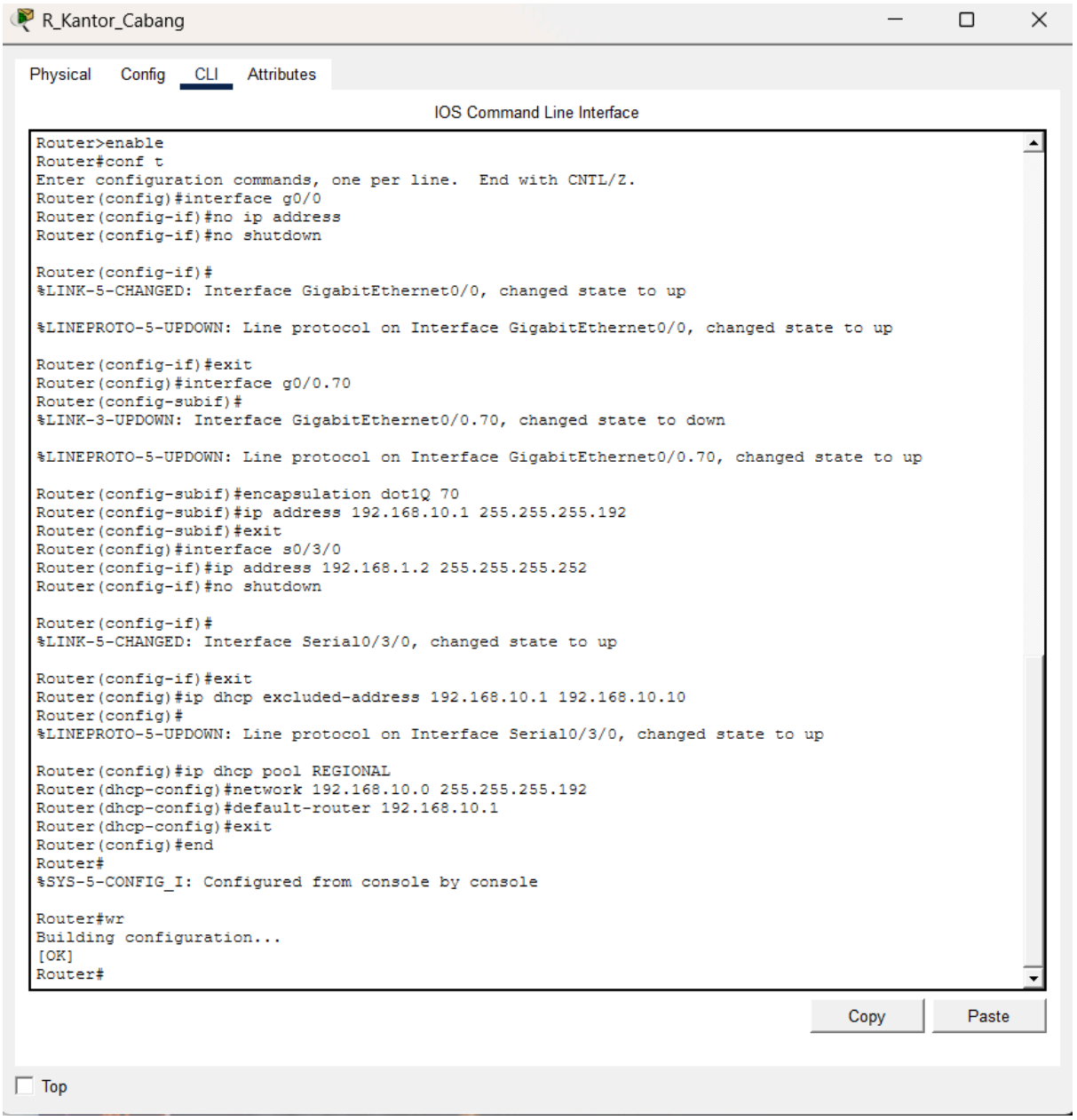
interface g0/0.70
 encapsulation dot1Q 70
 ip address 192.168.10.1 255.255.255.192

interface s0/3/0
 ip address 192.168.1.2 255.255.255.252
 no shutdown

ip dhcp excluded-address 192.168.10.1 192.168.10.10

ip dhcp pool REGIONAL
 network 192.168.10.0 255.255.255.192

default-router 192.168.10.1

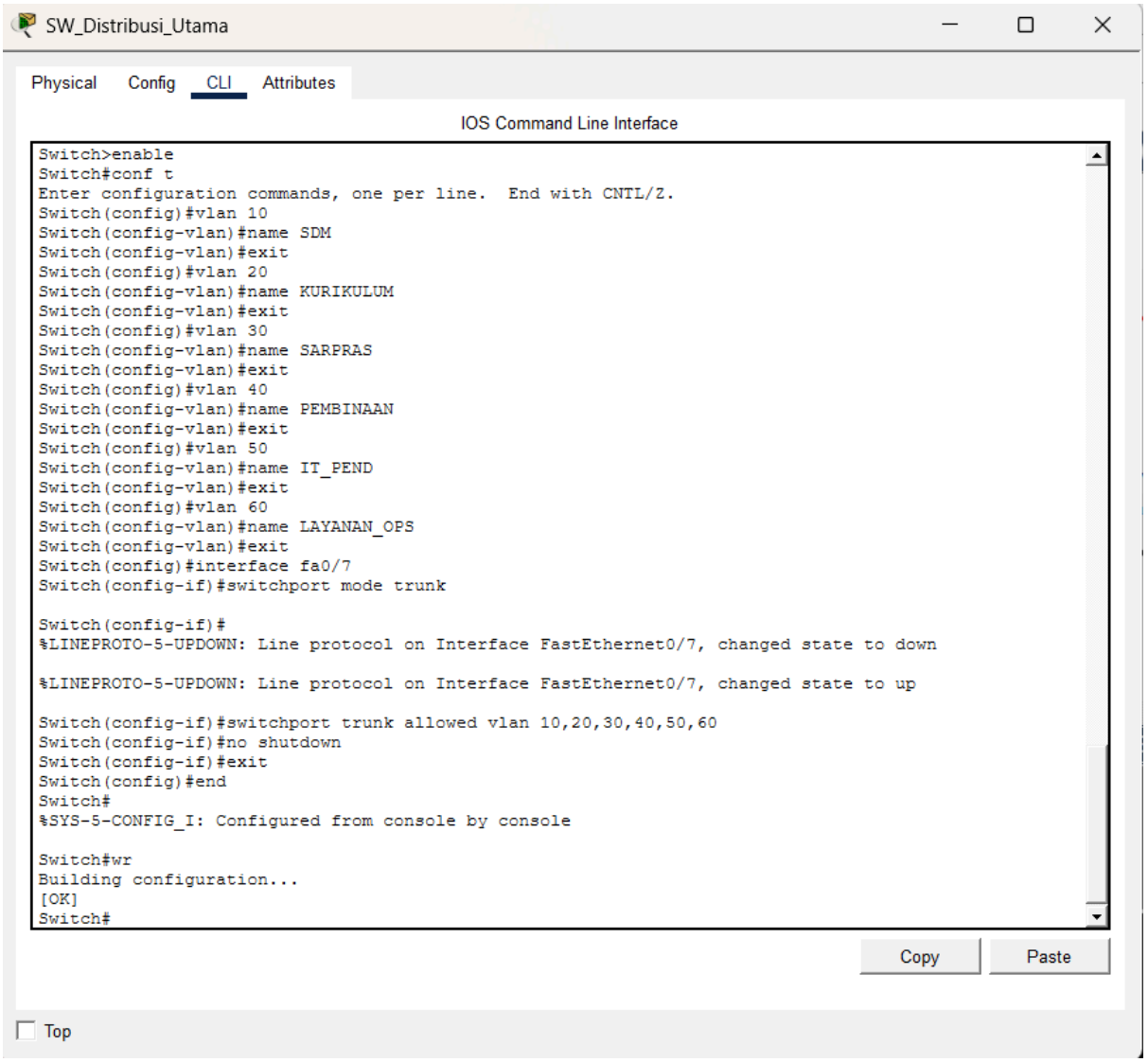


SWITCH DISTRIBUSI UTAMA

enable
conf t

vlan 10
 name SDM
vlan 20
 name KURIKULUM
vlan 30

```
 name SARPRAS
vlan 40
 name PEMBINAAN
vlan 50
 name IT_PEND
vlan 60
 name LAYANAN_OPS

interface fa0/7
 switchport mode trunk
 switchport trunk allowed vlan 10,20,30,40,50,60
 no shutdown

end
wr
```



SWITCH SDM

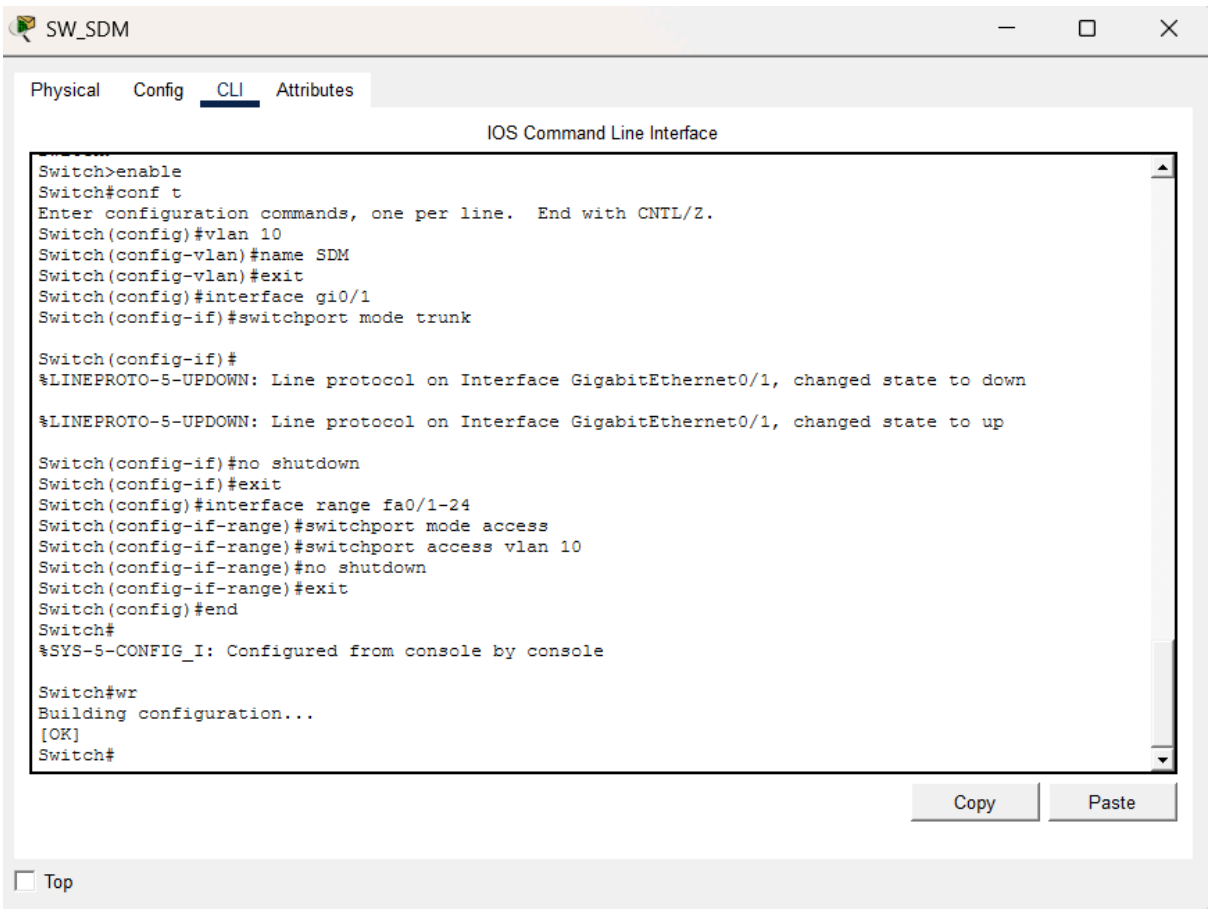
conf t

vlan 10
 name SDM

interface gi0/1
 switchport mode trunk
 no shutdown

interface range fa0/1-24
 switchport mode access
 switchport access vlan 10
 no shutdown

end
wr



SWITCH KURIKULUM

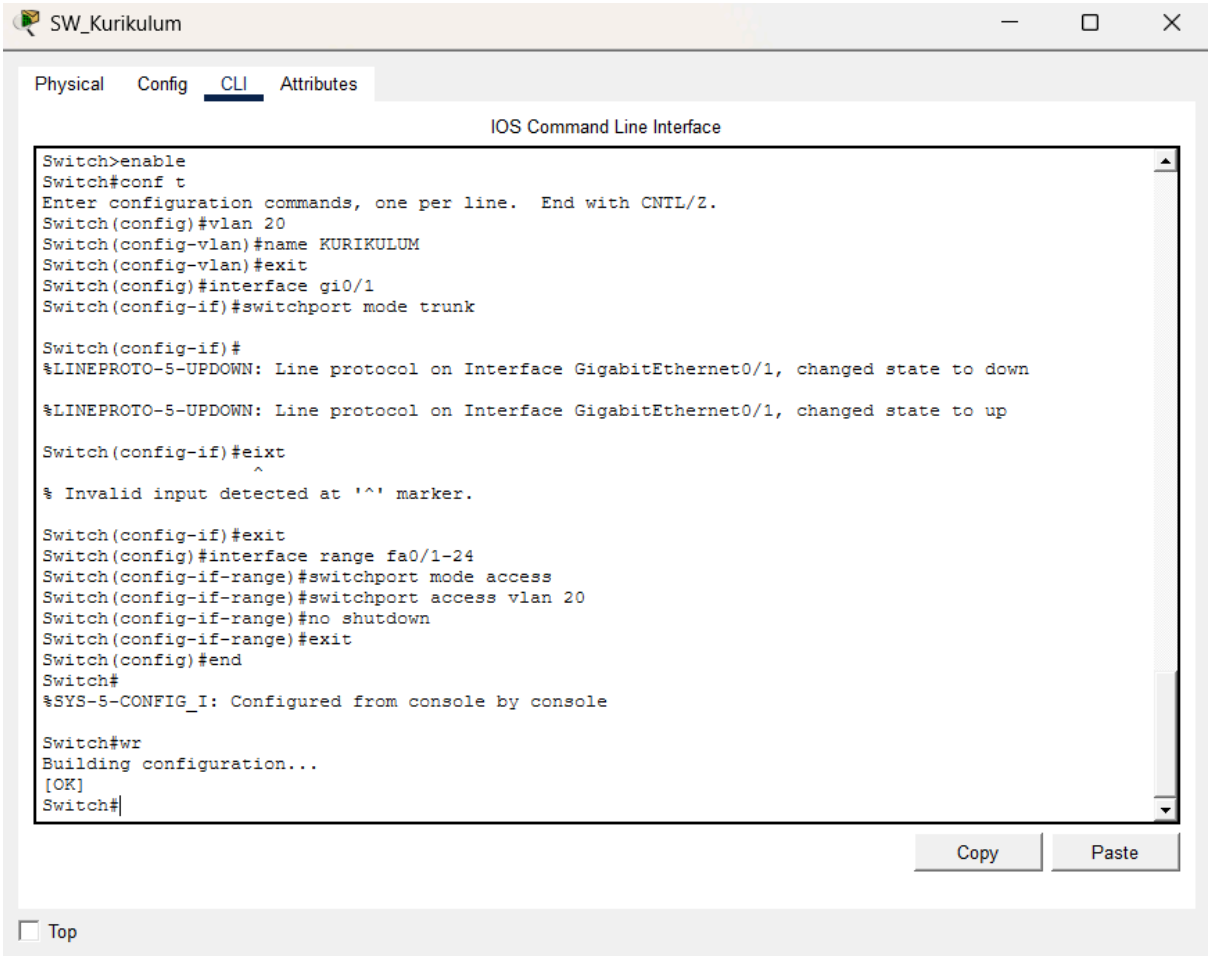
conf t

vlan 20
 name KURIKULUM

interface gi0/1
 switchport mode trunk

interface range fa0/1-24
 switchport mode access
 switchport access vlan 20
 no shutdown

end
wr



SWITCH SARPRAS

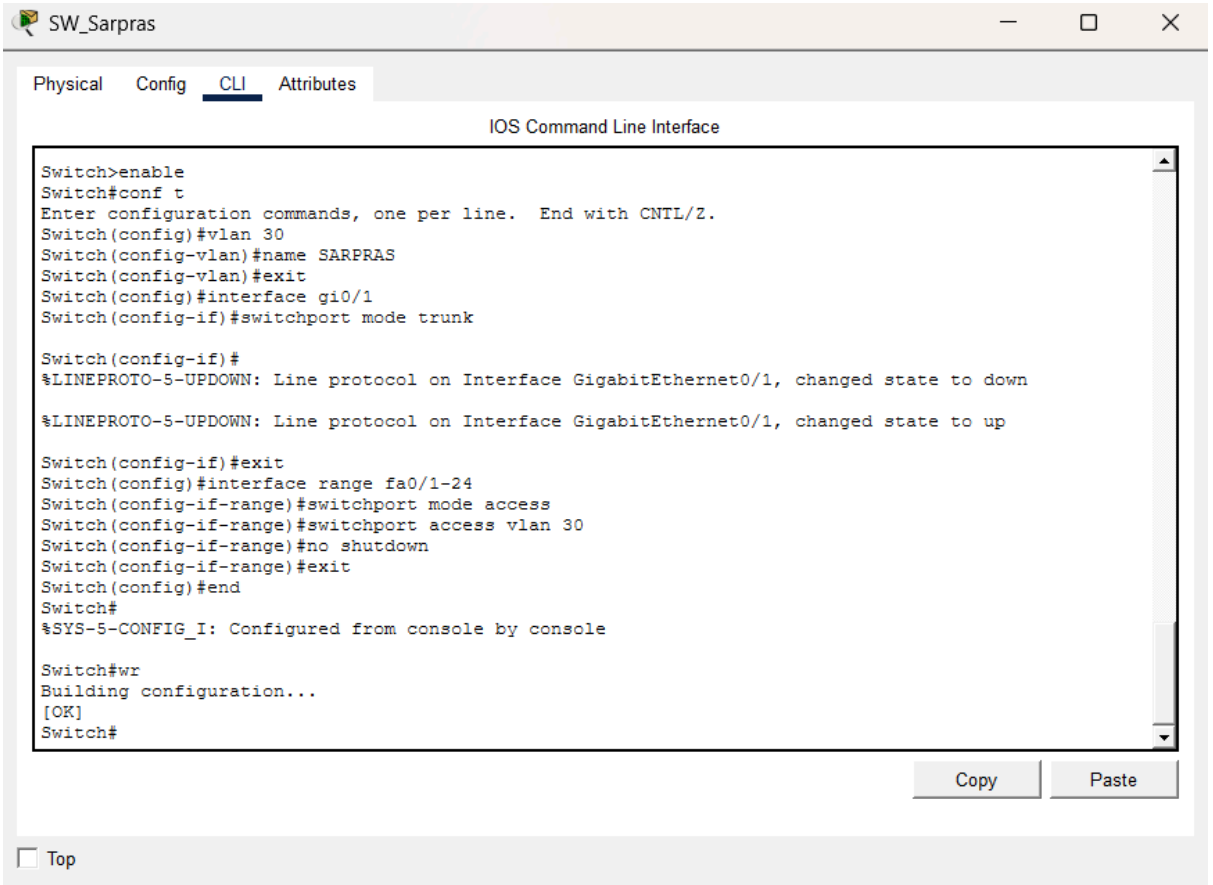
conf t

vlan 30
 name SARPRAS

interface gi0/1
 switchport mode trunk

interface range fa0/1-24
 switchport mode access
 switchport access vlan 30
 no shutdown

end
wr



SWITCH PEMBINAAN

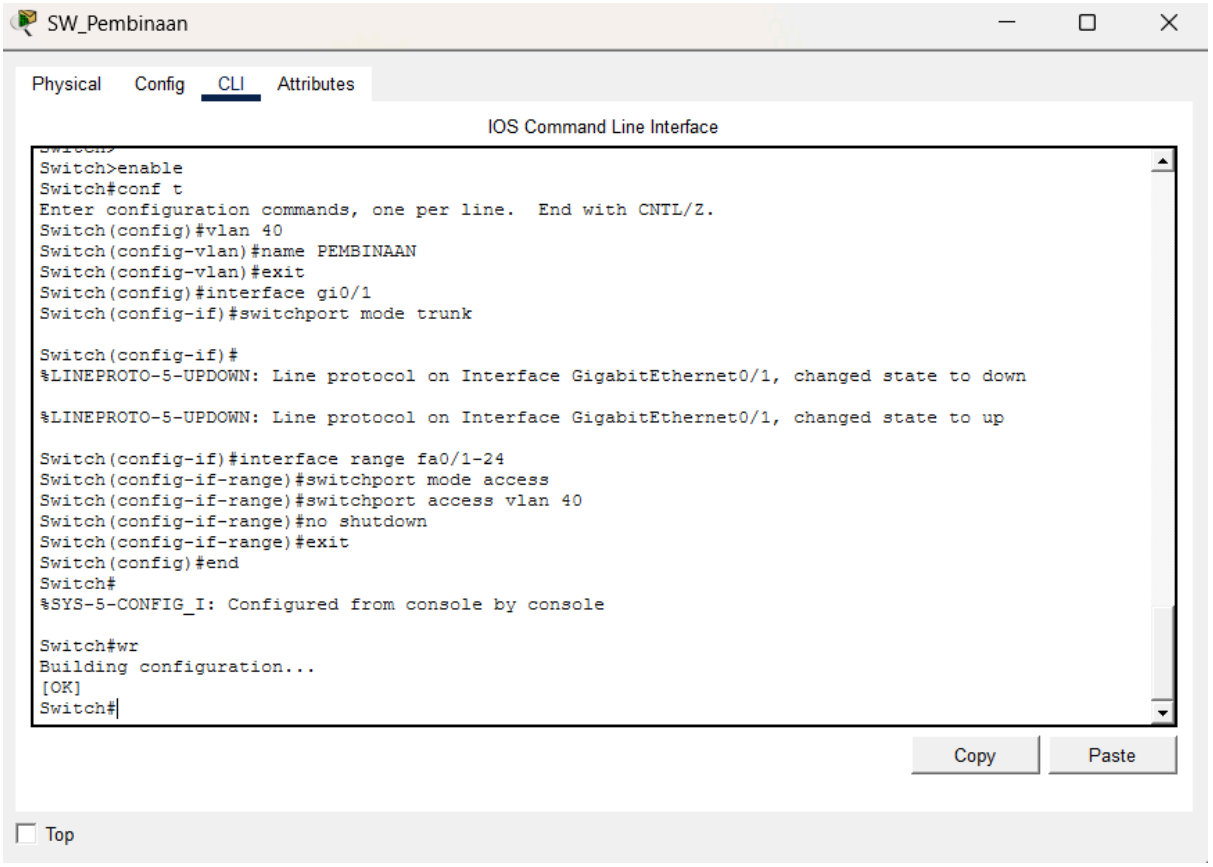
conf t

vlan 40
 name PEMBINAAN

interface gi0/1
 switchport mode trunk

interface range fa0/1-24
 switchport mode access
 switchport access vlan 40
 no shutdown

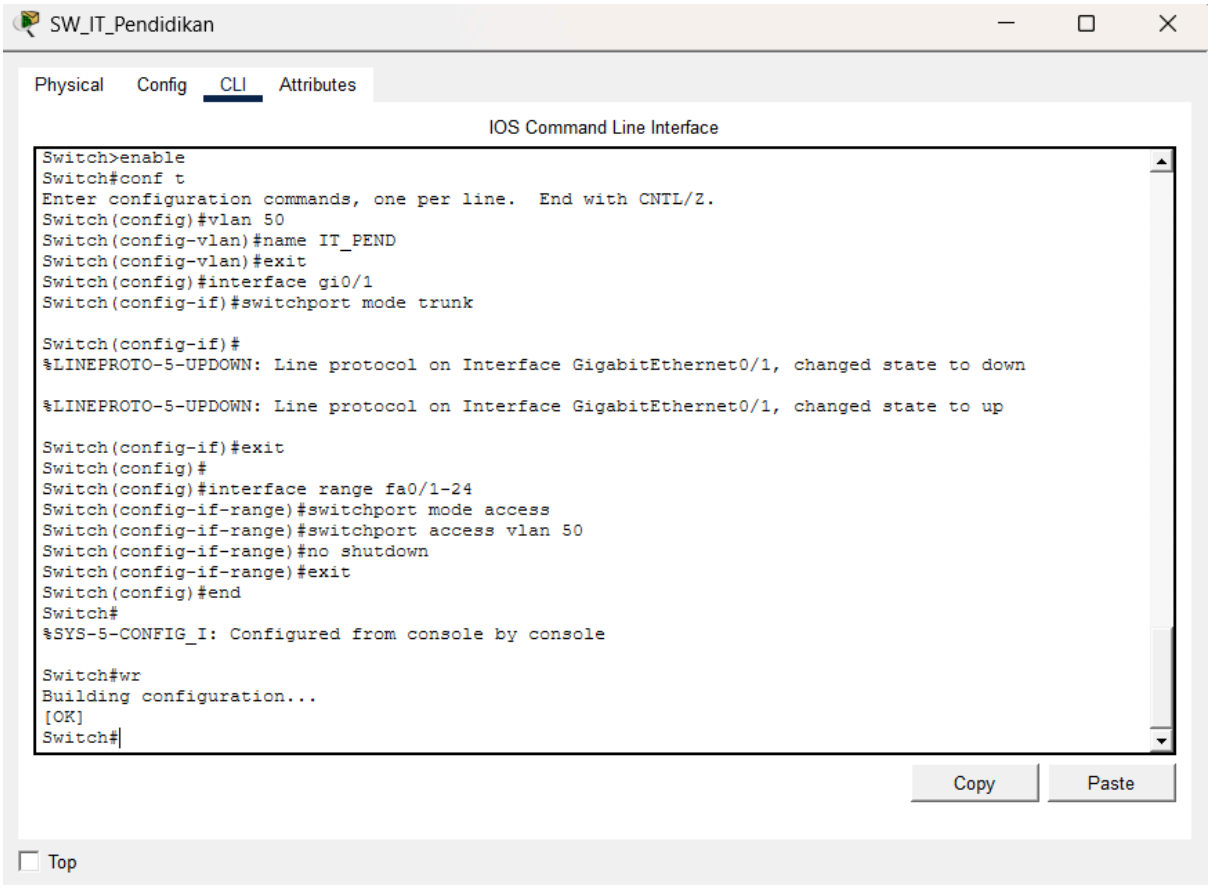
end
wr



SWITCH IT_PEND

conf t

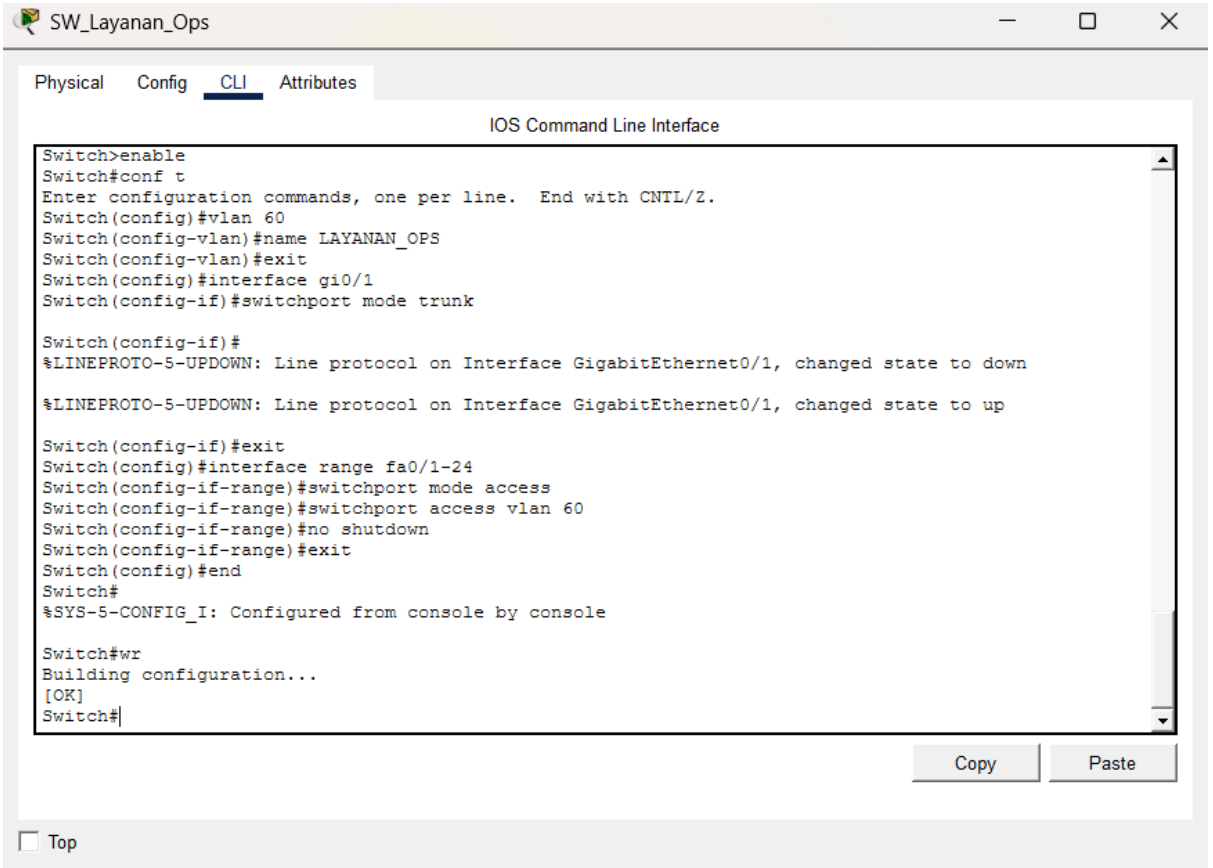
```
vlan 50
 name IT_PEND

interface gi0/1
 switchport mode trunk

interface range fa0/1-24
 switchport mode access
 switchport access vlan 50
 no shutdown

end
wr
```



SWITCH LAYANAN OPS

```
conf t
```

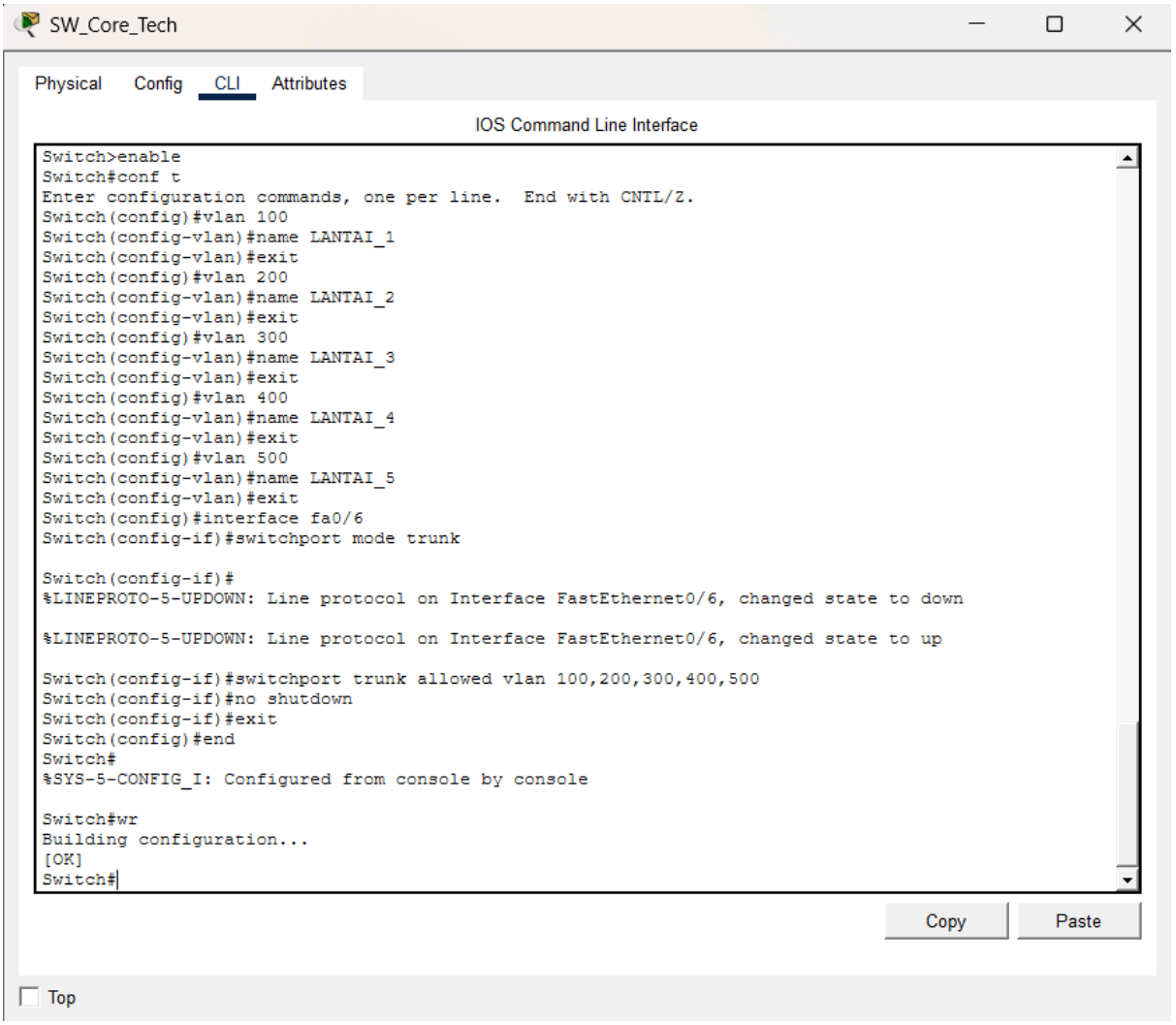
```
vlan 60
 name LAYANAN_OPS

interface gi0/1
 switchport mode trunk

interface range fa0/1-24
 switchport mode access
 switchport access vlan 60
 no shutdown

end
wr
```



SWITCH CORE ARA TECH

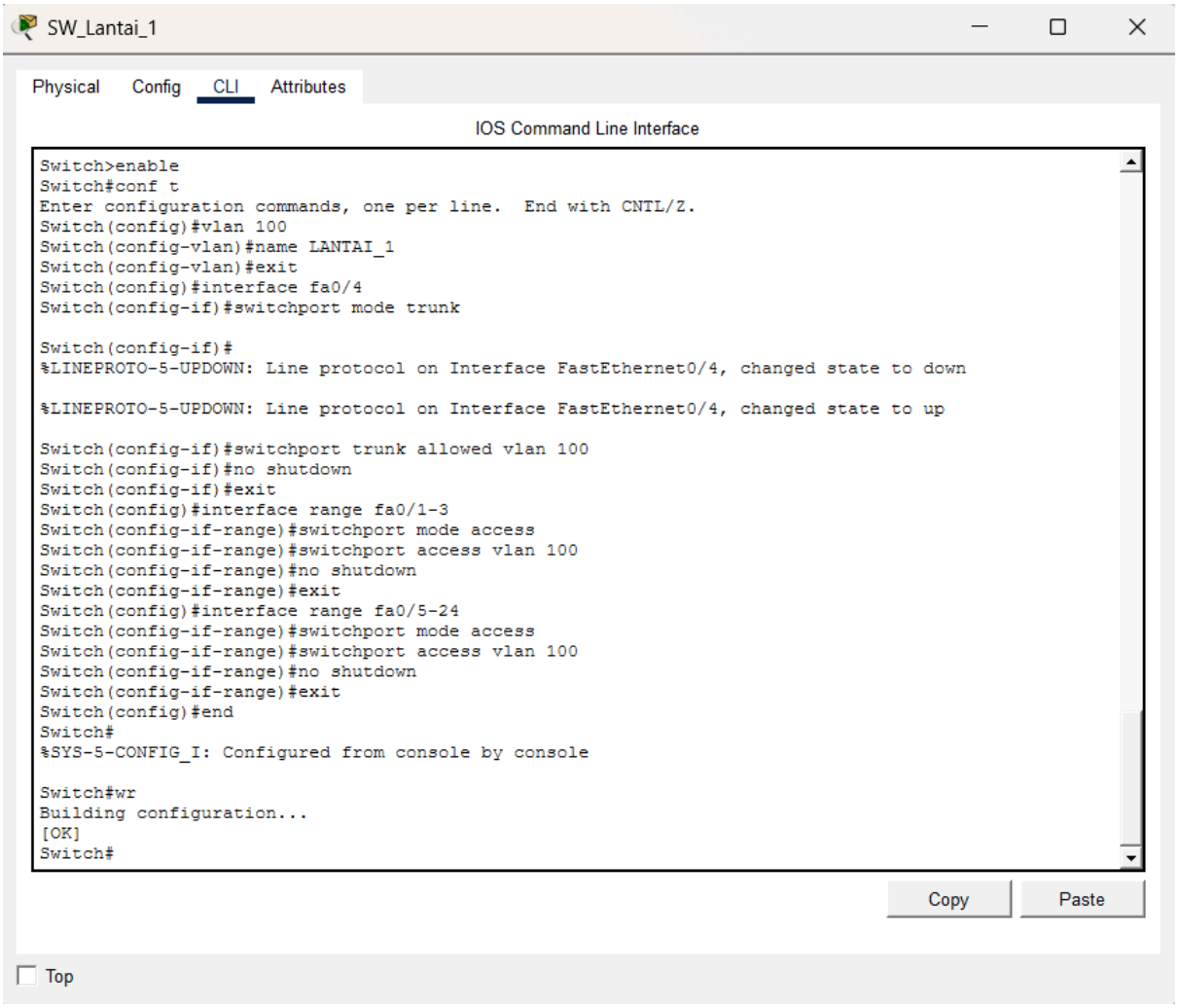
```
enable
conf t

vlan 100
 name LANTAI_1
```

```
vlan 200
 name LANTAI_2
vlan 300
 name LANTAI_3
vlan 400
 name LANTAI_4
vlan 500
 name LANTAI_5

interface fa0/6
 switchport mode trunk
 switchport trunk allowed vlan 100,200,300,400,500
 no shutdown

end
wr
```



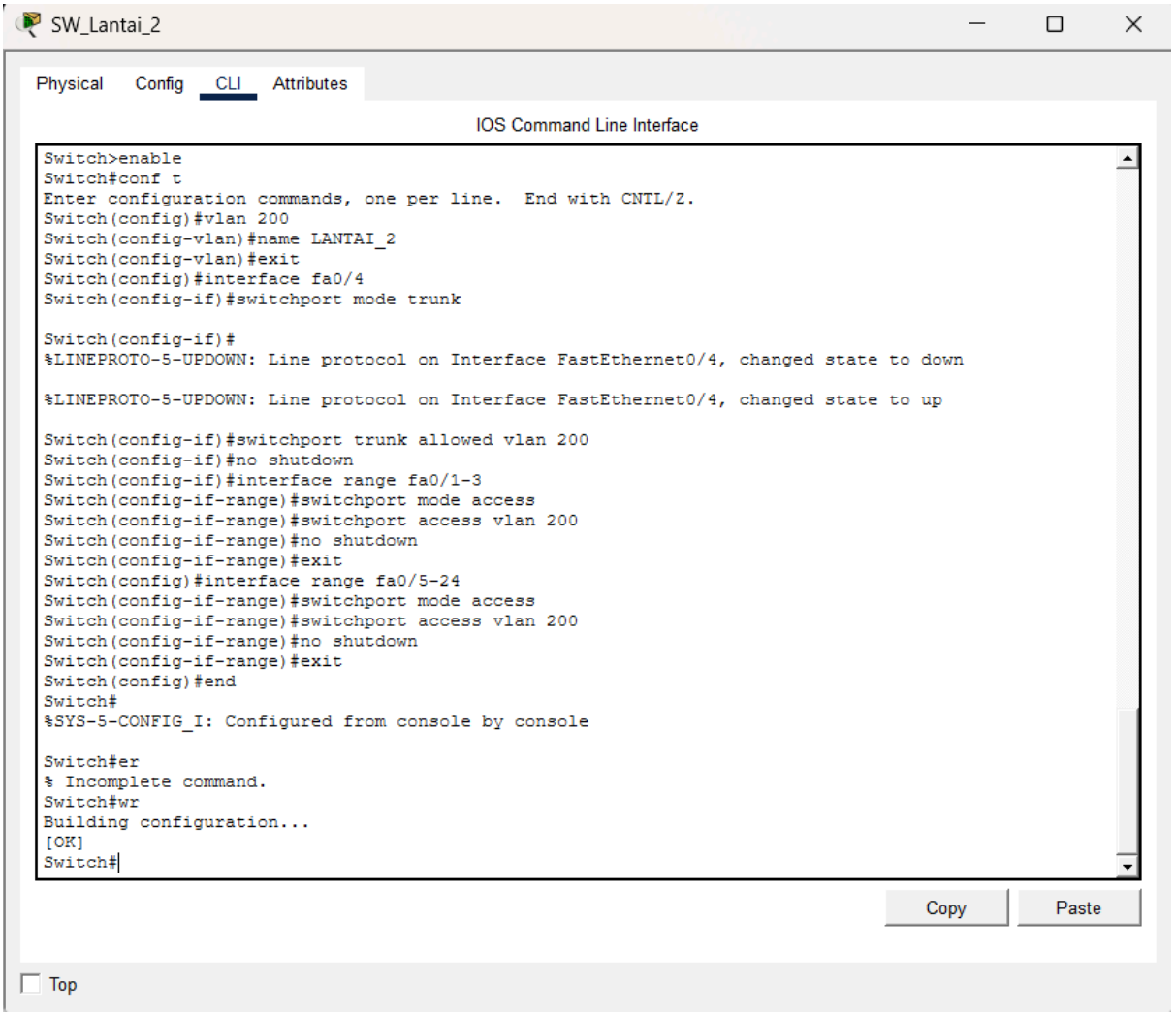
SWITCH LANTAI 1

```
conf t
vlan 100
 name LANTAI_1

interface fa0/4
 switchport mode trunk
 switchport trunk allowed vlan 100
 no shutdown
interface range fa0/1-3
 switchport mode access
 switchport access vlan 100
 no shutdown
interface range fa0/5-24
 switchport mode access
 switchport access vlan 100
 no shutdown
end
wr
```



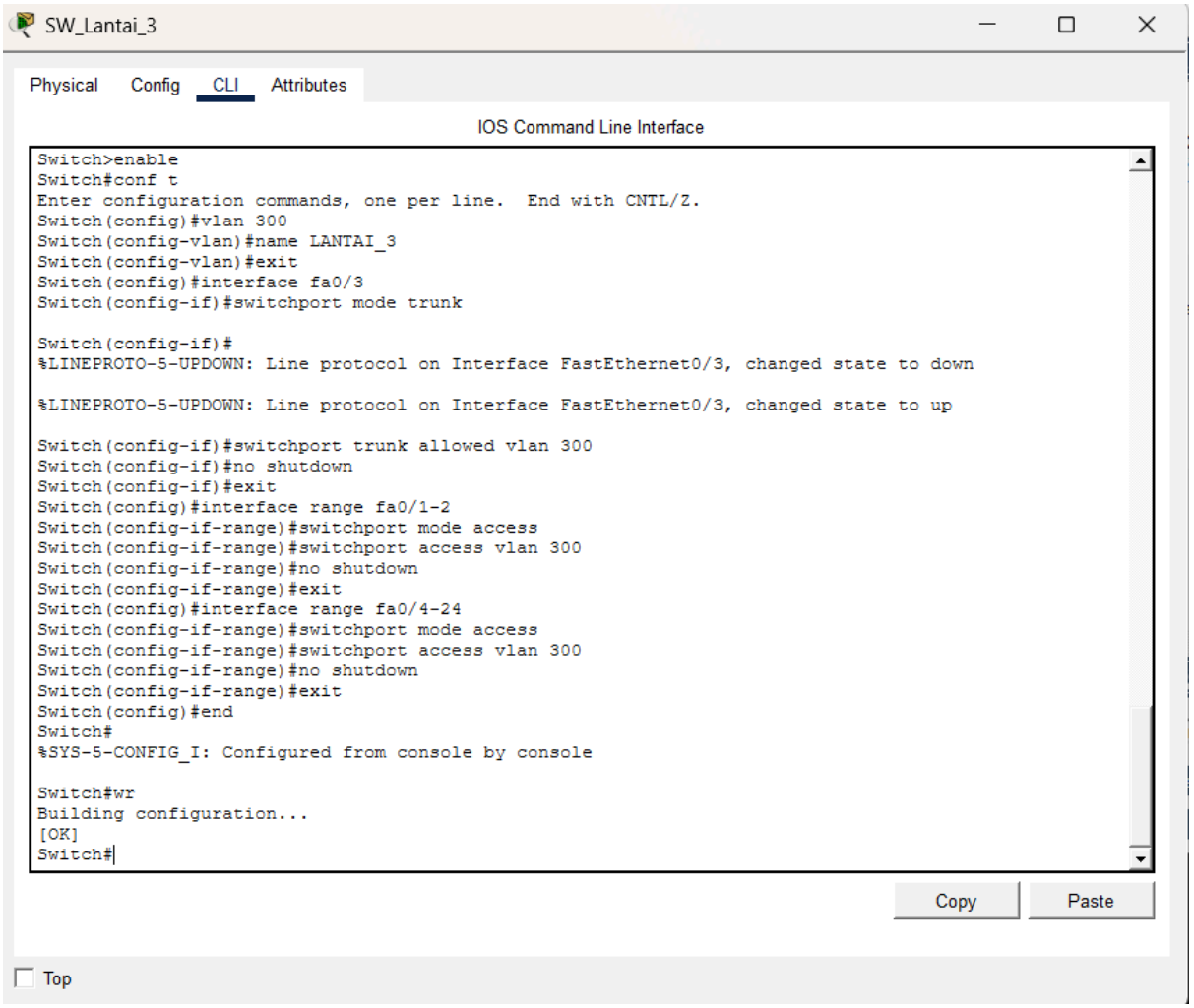
SWITCH LANTAI 2

```
conf t
vlan 200
 name LANTAI_2

interface fa0/4
 switchport mode trunk
 switchport trunk allowed vlan 200
 no shutdown
interface range fa0/1-3
 switchport mode access
 switchport access vlan 200
 no shutdown
interface range fa0/5-24
 switchport mode access
 switchport access vlan 200
 no shutdown
end
wr
```



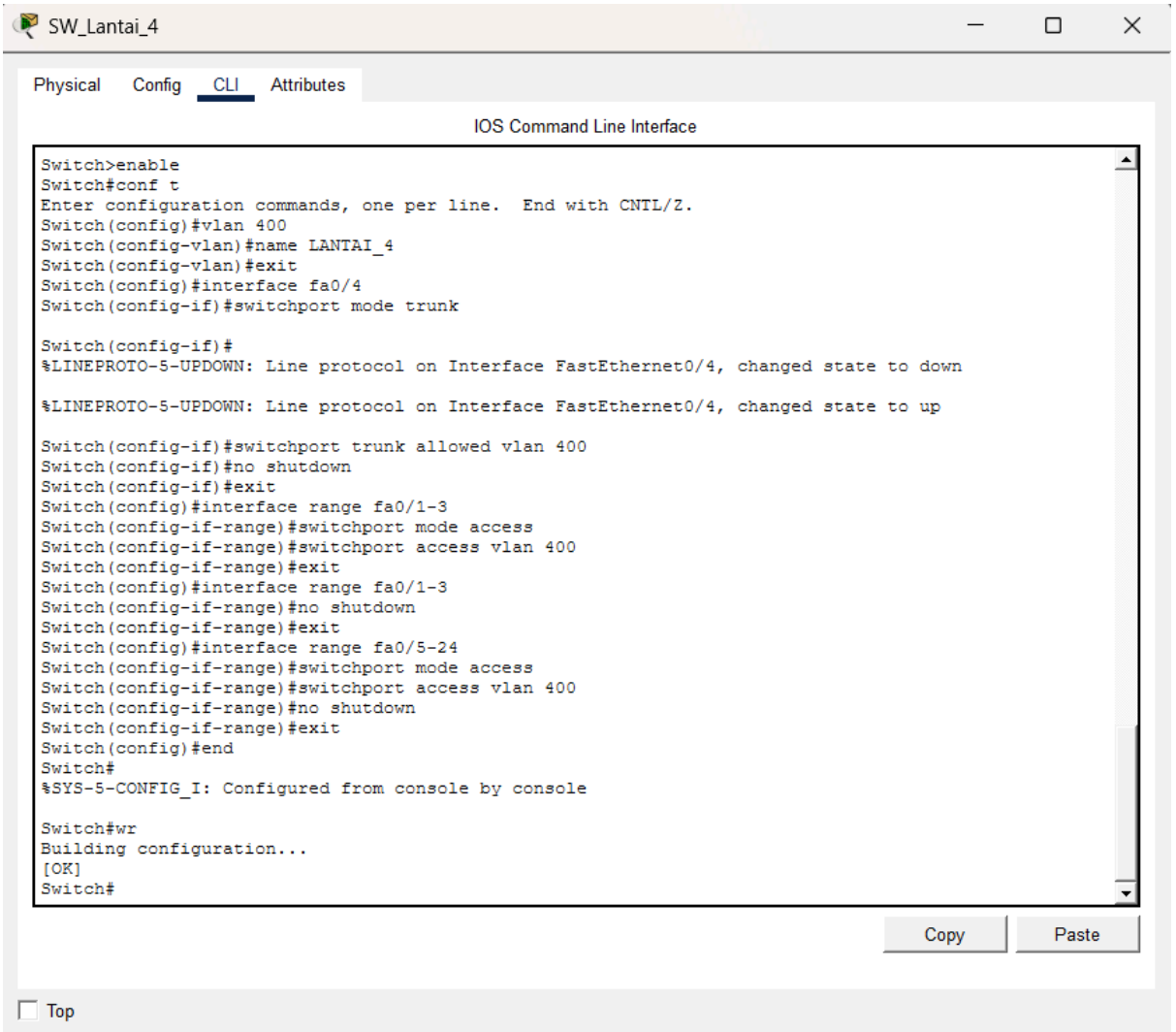
SWITCH LANTAI 3

```
conf t
vlan 300
 name LANTAI_3

interface fa0/3
 switchport mode trunk
 switchport trunk allowed vlan 300
 no shutdown
interface range fa0/1-2
 switchport mode access
 switchport access vlan 300
 no shutdown
interface range fa0/4-24
 switchport mode access
 switchport access vlan 300
 no shutdown
end
wr
```



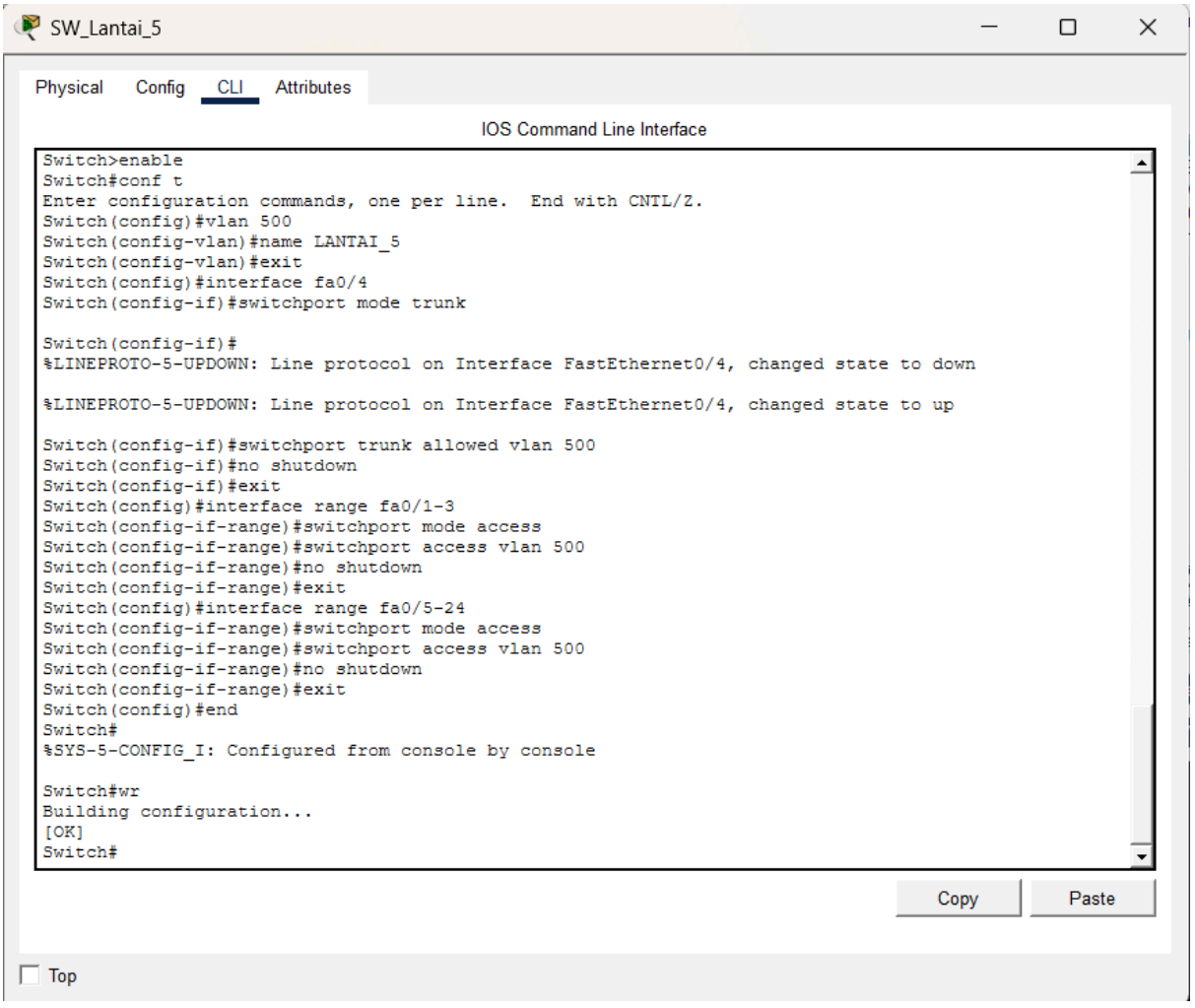
SWITCH LANTAI 4

```
conf t
vlan 400
 name LANTAI_4

interface fa0/4
 switchport mode trunk
 switchport trunk allowed vlan 400
 no shutdown
interface range fa0/1-3
 switchport mode access
 switchport access vlan 400
 no shutdown
interface range fa0/5-24
 switchport mode access
 switchport access vlan 400
 no shutdown
end
wr
```



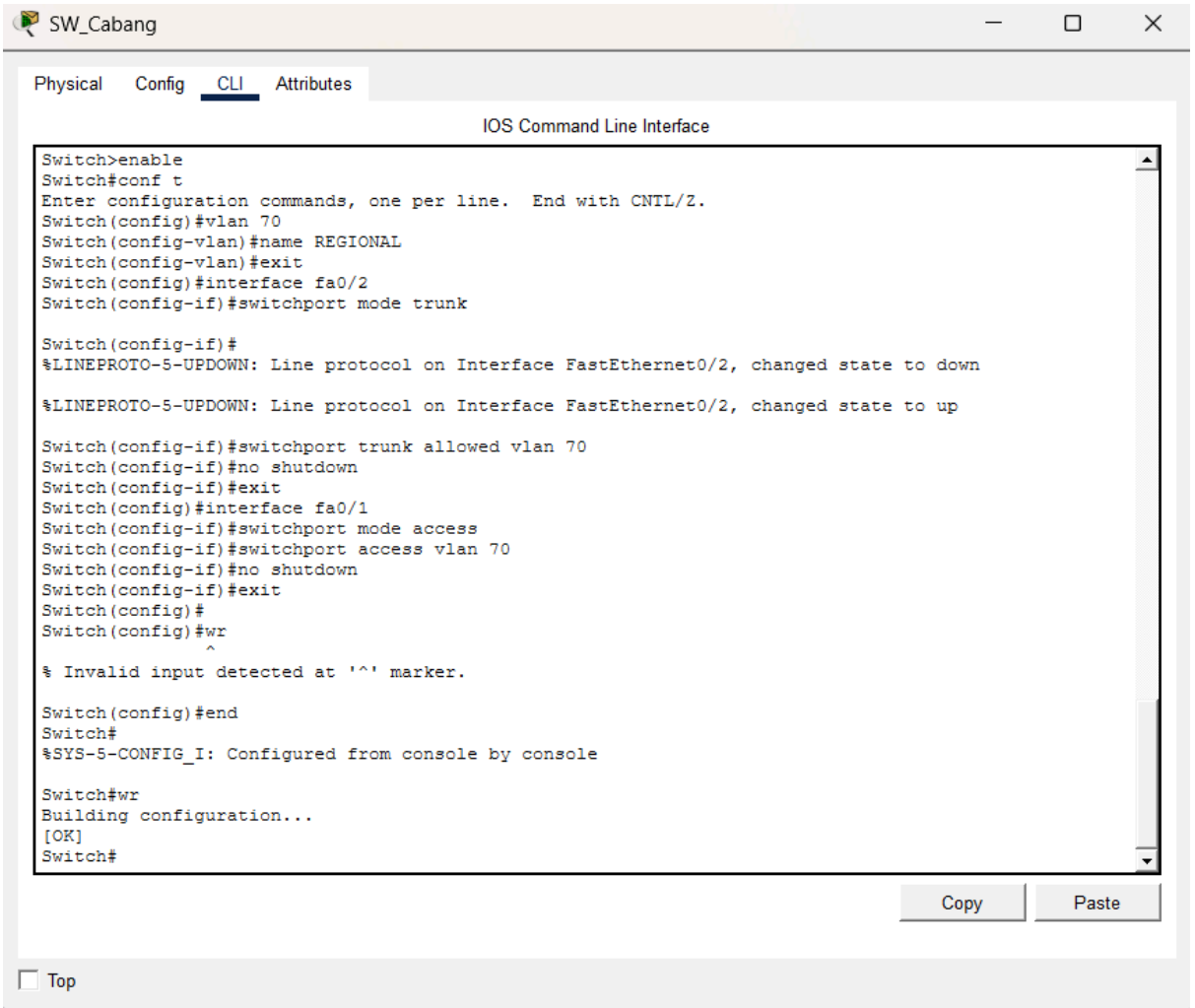
SWITCH LANTAI 5

```
conf t
vlan 500
 name LANTAI_5

interface fa0/4
 switchport mode trunk
 switchport trunk allowed vlan 500
 no shutdown
interface range fa0/1-3
 switchport mode access
 switchport access vlan 500
 no shutdown
interface range fa0/5-24
 switchport mode access
 switchport access vlan 500
 no shutdown
end
wr
```



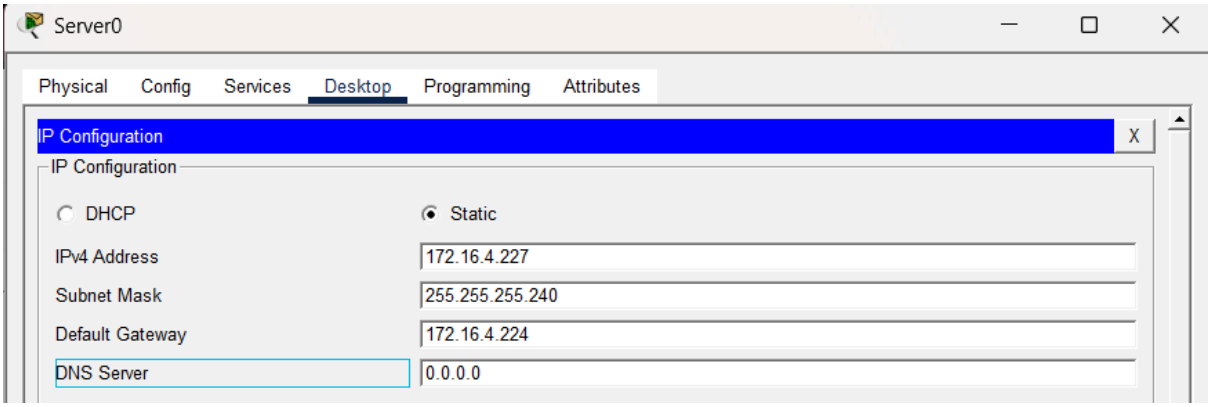
SWITCH KANTOR CABANG

```
enable
conf t
vlan 70
 name REGIONAL

interface fa0/2
 switchport mode trunk
 switchport trunk allowed vlan 70
 no shutdown

interface fa0/1
 switchport mode access
 switchport access vlan 70
 no shutdown

end
wr
```



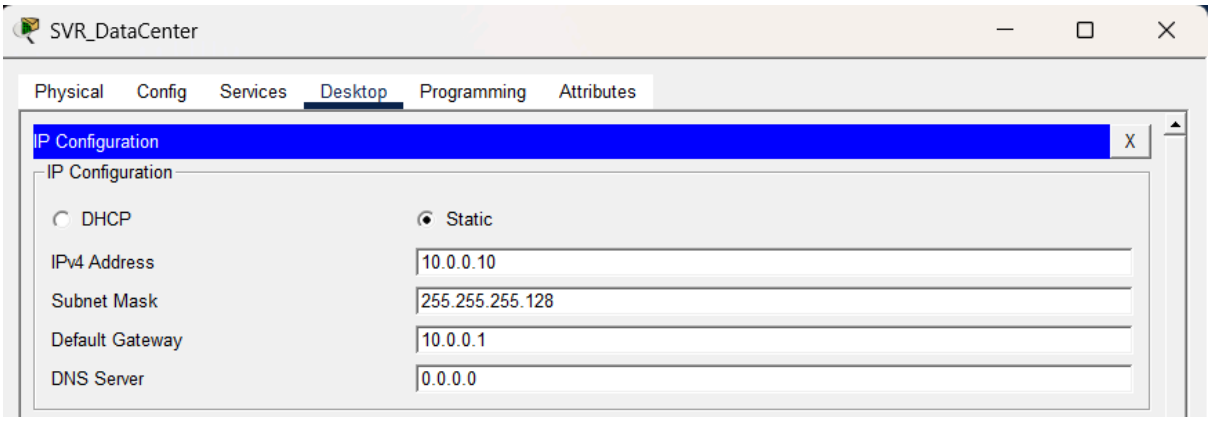
SERVER0 IT_PEND

172.16.4.227
255.255.255.240
172.16.4.224



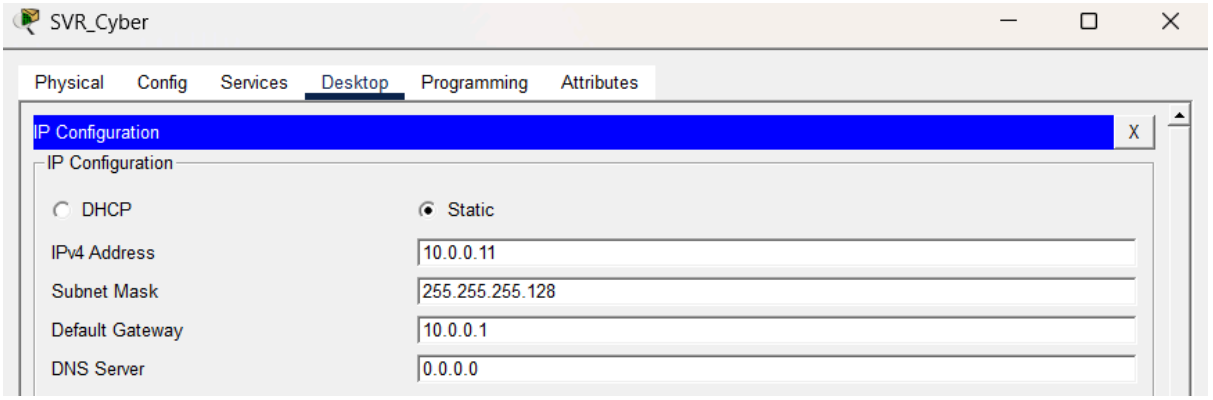
SERVER DATCEN

10.0.0.10
255.255.255.128
10.0.0.1



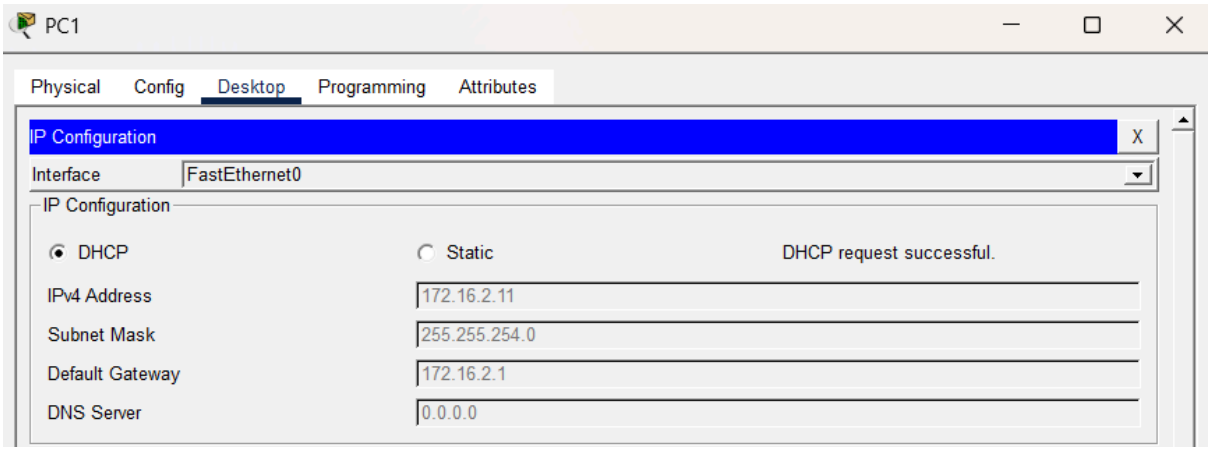
SERVER CYBER

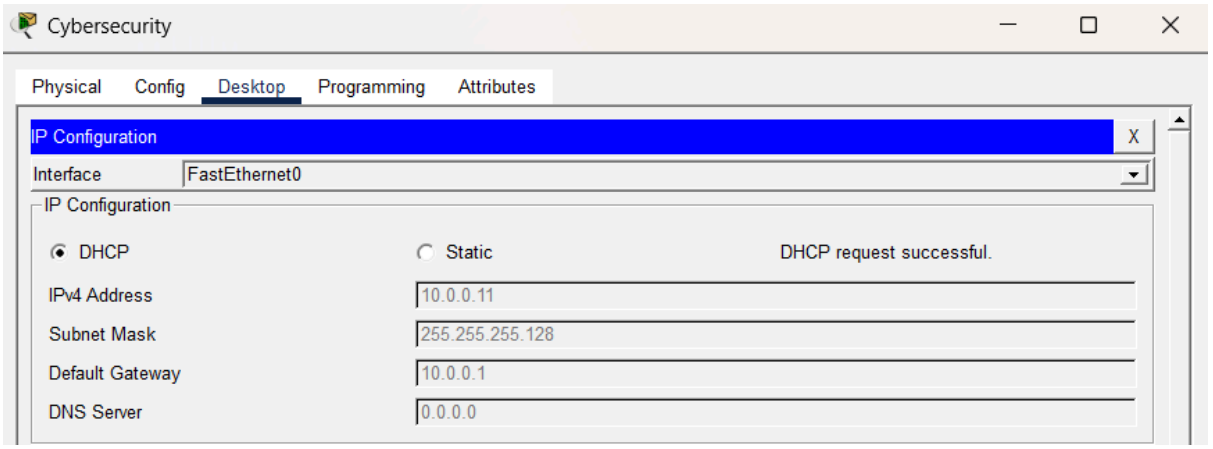
10.0.0.11
255.255.255.128
10.0.0.1



ALL PC

ke desktop > ganti ip dari statuc ke dhcp, contoh berhasil:





Contoh ping

Gedung Utama

PC0 SDM > Router (Default Gateway)

```
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::207:ECFF:FE82:73B0
   IPv6 Address.....: ::
   IPv4 Address.....: 172.16.4.11
   Subnet Mask.....: 255.255.255.128
   Default Gateway.....: ::
                                 172.16.4.1

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: ::
   IPv6 Address.....: ::
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: ::
                                 0.0.0.0
```

```
C:\>ping 172.16.4.1

Pinging 172.16.4.1 with 32 bytes of data:

Reply from 172.16.4.1: bytes=32 time<1ms TTL=255
Reply from 172.16.4.1: bytes=32 time<1ms TTL=255
Reply from 172.16.4.1: bytes=32 time<1ms TTL=255
Reply from 172.16.4.1: bytes=32 time=96ms TTL=255

Ping statistics for 172.16.4.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 96ms, Average = 24ms
```

PC0 SDM > PC5 LAYANAN_OPS

```
C:\>ping 172.16.0.11

Pinging 172.16.0.11 with 32 bytes of data:

Request timed out.
Reply from 172.16.0.11: bytes=32 time<1ms TTL=127
Reply from 172.16.0.11: bytes=32 time<1ms TTL=127
Reply from 172.16.0.11: bytes=32 time<1ms TTL=127

Ping statistics for 172.16.0.11:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

ARA

PC Server Room > Router (Default Gateway)

```
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::20D:BDFF:FECB:2496
   IPv6 Address.....: ::
   IPv4 Address.....: 10.0.0.12
   Subnet Mask.....: 255.255.255.128
   Default Gateway.....: ::
                                 10.0.0.1

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: ::
   IPv6 Address.....: ::
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: ::
                                 0.0.0.0
```

```
C:\>ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:

Reply from 10.0.0.1: bytes=32 time<1ms TTL=255
Reply from 10.0.0.1: bytes=32 time=11ms TTL=255
Reply from 10.0.0.1: bytes=32 time<1ms TTL=255
Reply from 10.0.0.1: bytes=32 time<1ms TTL=255

Ping statistics for 10.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 11ms, Average = 2ms
```

PC Legal > PC Marketing

```
C:\>ping 10.0.0.139

Pinging 10.0.0.139 with 32 bytes of data:

Request timed out.
Reply from 10.0.0.139: bytes=32 time<1ms TTL=127
Reply from 10.0.0.139: bytes=32 time=14ms TTL=127
Reply from 10.0.0.139: bytes=32 time<1ms TTL=127

Ping statistics for 10.0.0.139:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 14ms, Average = 4ms

C:\>
```

Cabang

PC Regional > Router (Default Gateway)

```
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::290:CFF:FE5C:2AA9
   IPv6 Address.....: ::
   IPv4 Address.....: 192.168.10.11
   Subnet Mask.....: 255.255.255.192
   Default Gateway.....: ::
                                 192.168.10.1

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: ::
   IPv6 Address.....: ::
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: ::
                                 0.0.0.0
```

```
C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Nomer 5 (StatRoute & OSPF)

STATIS ROUTING & OSPF

ROUTING STATIS (LANTAI ARA TECH)

R ARA TECH

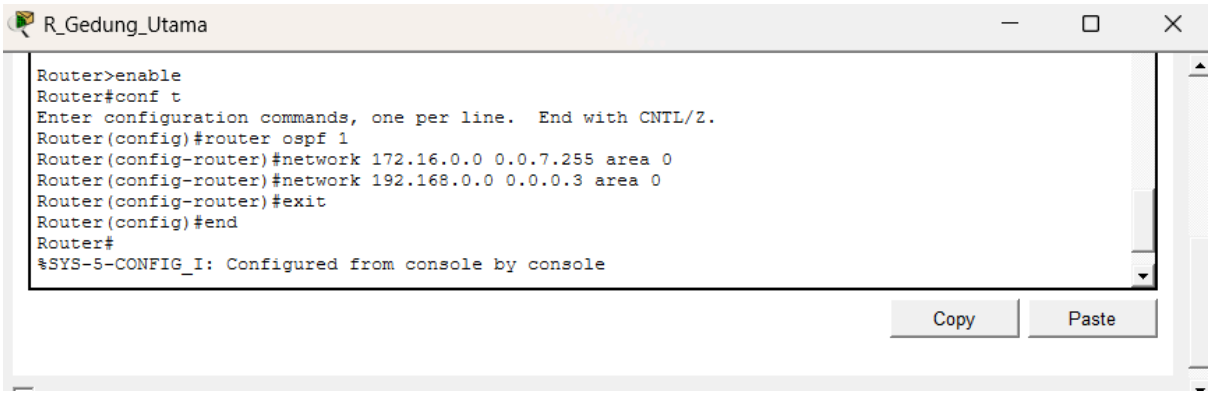
ip route 0.0.0.0 0.0.0.0 192.168.0.2

```
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.0.2
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wr
Building configuration...
[OK]
Router#
```

OSPF ANTAR GEDUNG & CABANG

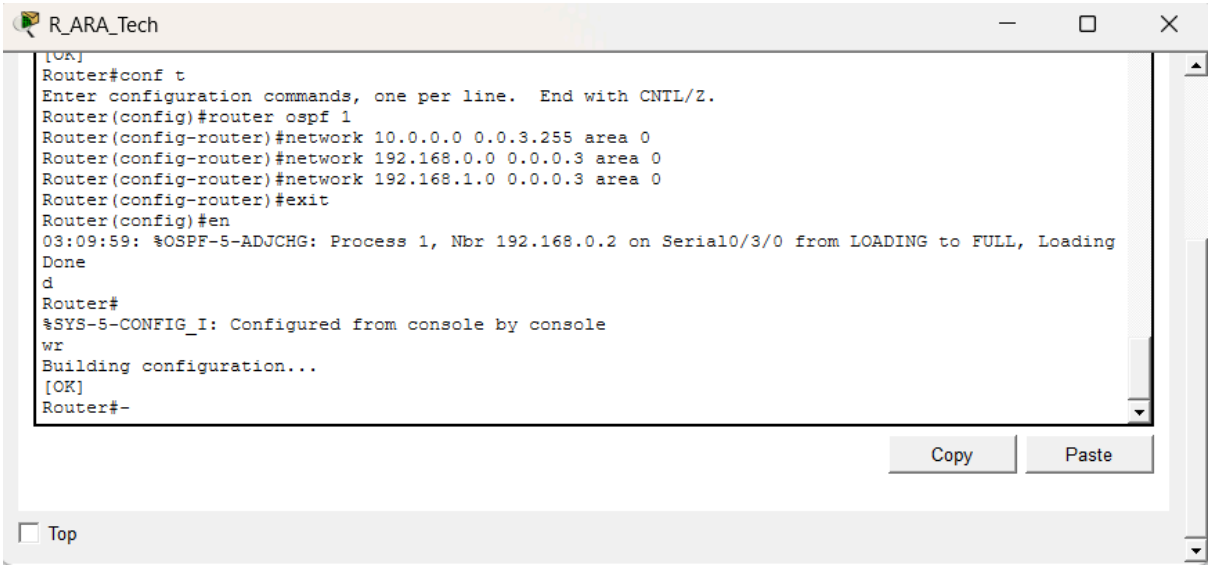
R GEDUNG UTAMA

router ospf 1
 network 172.16.0.0 0.0.7.255 area 0
 network 192.168.0.0 0.0.0.3 area 0



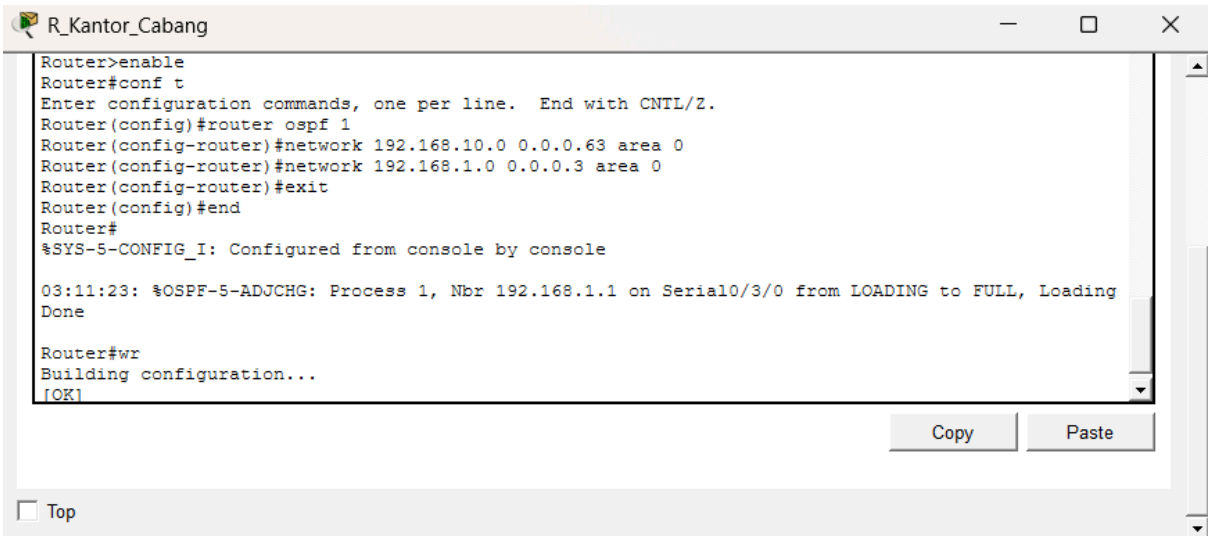
R ARA TECH

router ospf 1
 network 10.0.0.0 0.0.3.255 area 0
 network 192.168.0.0 0.0.0.3 area 0
 network 192.168.1.0 0.0.0.3 area 0



R CABANG

router ospf 1
 network 192.168.10.0 0.0.0.63 area 0
 network 192.168.1.0 0.0.0.3 area 0



Contoh Testing

PC > PC VLAN LAIN

PC Pembinaan (Gedung Utama) > PC Keuangan (ARA)

```
C:\>ping 10.0.1.139

Pinging 10.0.1.139 with 32 bytes of data:

Request timed out.
Reply from 10.0.1.139: bytes=32 time=9ms TTL=126
Reply from 10.0.1.139: bytes=32 time=1ms TTL=126
Reply from 10.0.1.139: bytes=32 time=13ms TTL=126

Ping statistics for 10.0.1.139:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 13ms, Average = 7ms

C:\>
```

PC Pendidikan (Gedung Utama) > PC Regional Office (Cabang)

```
C:\>ping 192.168.10.11

Pinging 192.168.10.11 with 32 bytes of data:

Reply from 192.168.10.11: bytes=32 time=4ms TTL=125
Reply from 192.168.10.11: bytes=32 time=3ms TTL=125
Reply from 192.168.10.11: bytes=32 time=2ms TTL=125
Reply from 192.168.10.11: bytes=32 time=3ms TTL=125

Ping statistics for 192.168.10.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 4ms, Average = 3ms
```

PC Auditorium (ARA) > PC Sarpras (Gedung Utama)

```
C:\>ping 172.16.4.139

Pinging 172.16.4.139 with 32 bytes of data:

Request timed out.
Reply from 172.16.4.139: bytes=32 time=2ms TTL=126
Reply from 172.16.4.139: bytes=32 time=1ms TTL=126
Reply from 172.16.4.139: bytes=32 time=2ms TTL=126

Ping statistics for 172.16.4.139:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms
```

PC > ROUTER GEDUNG LAIN

PC Kurikulum (Gedung Utama) > Router ARA Tech

```
C:\>ping 192.168.0.1

Pinging 192.168.0.1 with 32 bytes of data:

Reply from 192.168.0.1: bytes=32 time=1ms TTL=254
Reply from 192.168.0.1: bytes=32 time=1ms TTL=254
Reply from 192.168.0.1: bytes=32 time=1ms TTL=254
Reply from 192.168.0.1: bytes=32 time=1ms TTL=254

Ping statistics for 192.168.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

PC Rnd (ARA) > Router Gedung Utama

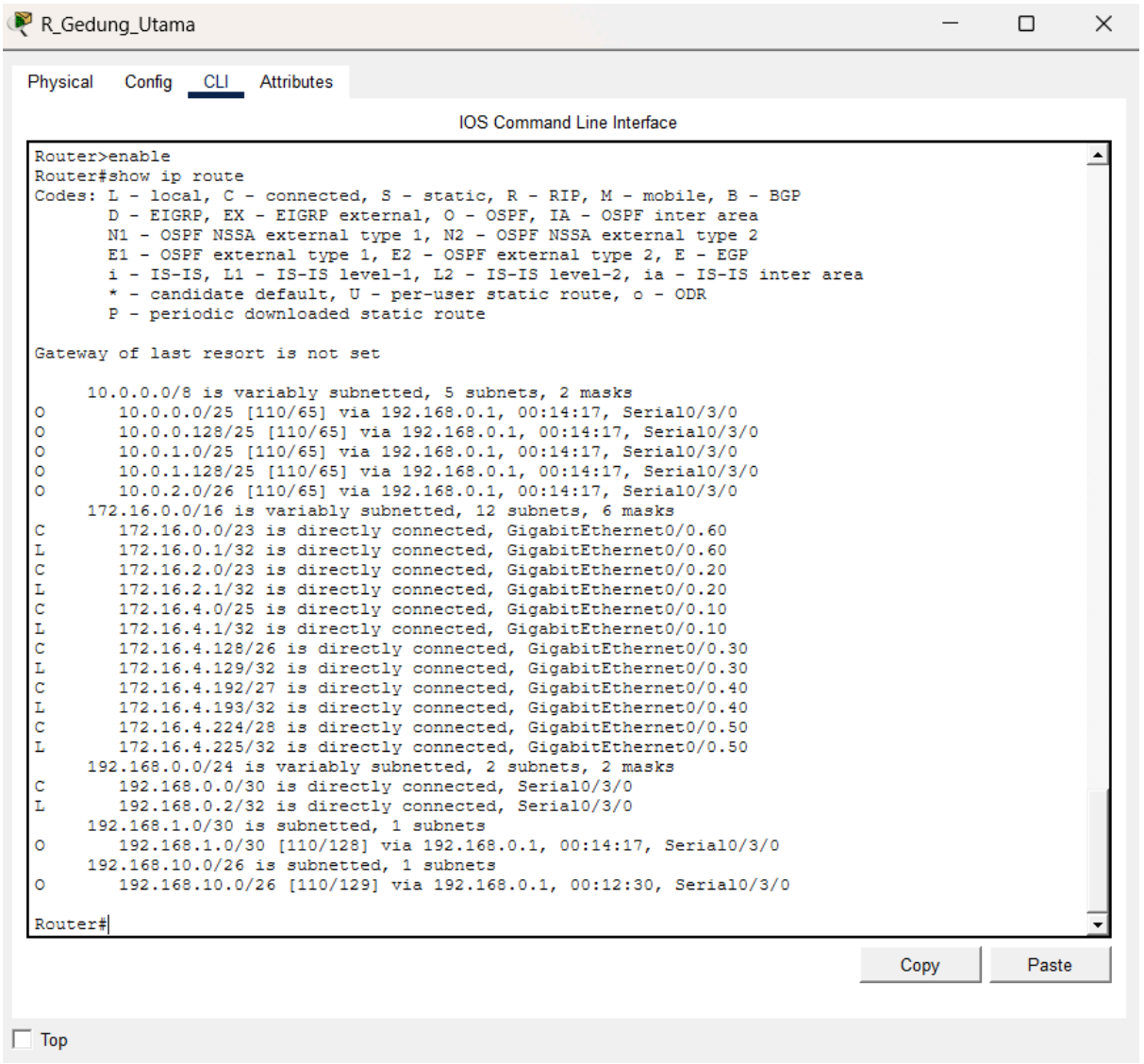
```
C:\>ping 192.168.0.2

Pinging 192.168.0.2 with 32 bytes of data:

Reply from 192.168.0.2: bytes=32 time=1ms TTL=254
Reply from 192.168.0.2: bytes=32 time=1ms TTL=254
Reply from 192.168.0.2: bytes=32 time=18ms TTL=254
Reply from 192.168.0.2: bytes=32 time=1ms TTL=254

Ping statistics for 192.168.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 18ms, Average = 5ms
```

PC Sales (ARA) > Router Gedung Cabang

```
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=1ms TTL=254
Reply from 192.168.1.2: bytes=32 time=20ms TTL=254
Reply from 192.168.1.2: bytes=32 time=3ms TTL=254
Reply from 192.168.1.2: bytes=32 time=1ms TTL=254

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 20ms, Average = 6ms
```

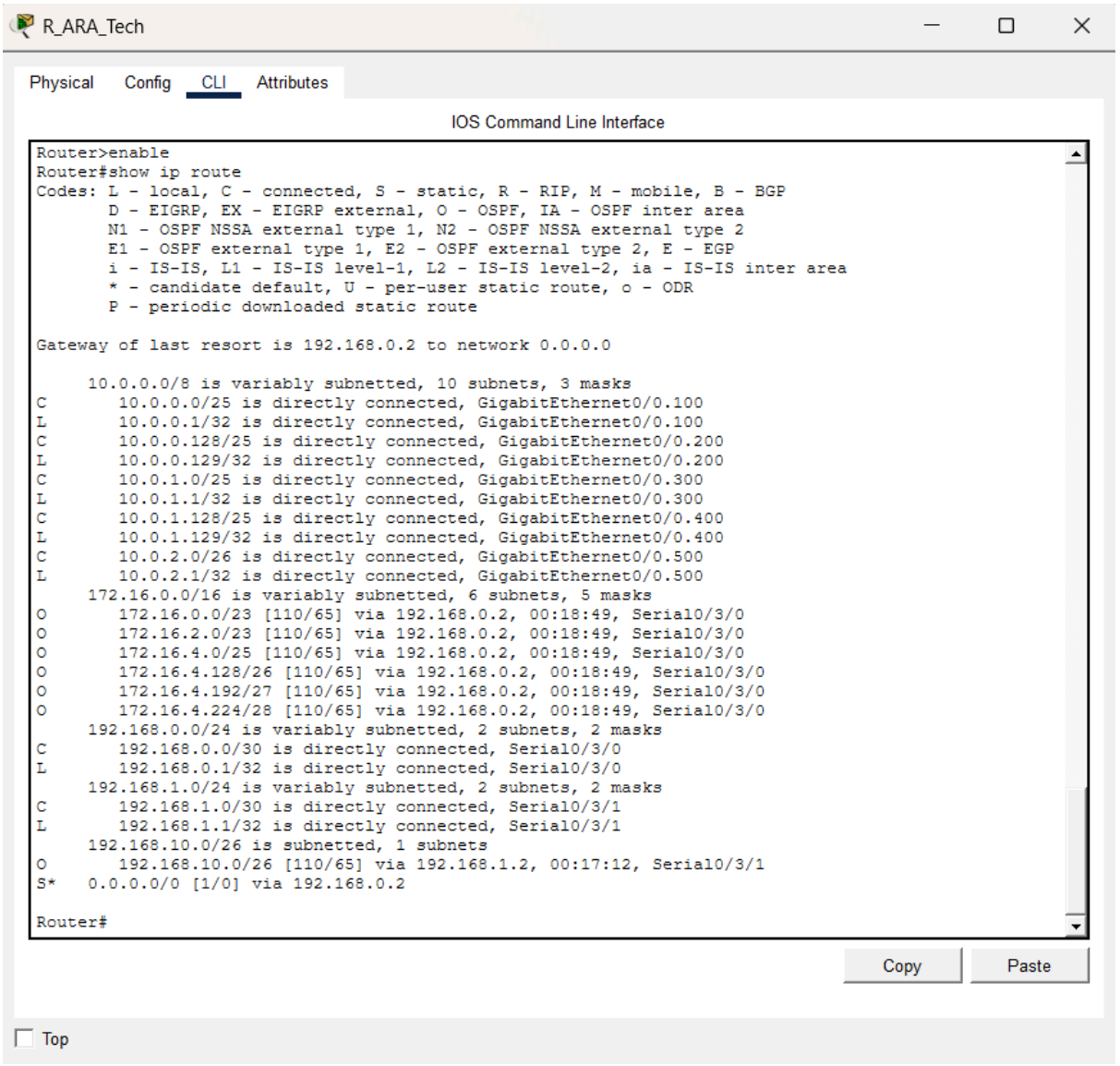
CEK ROUTING TABLE

R Gedung Utama

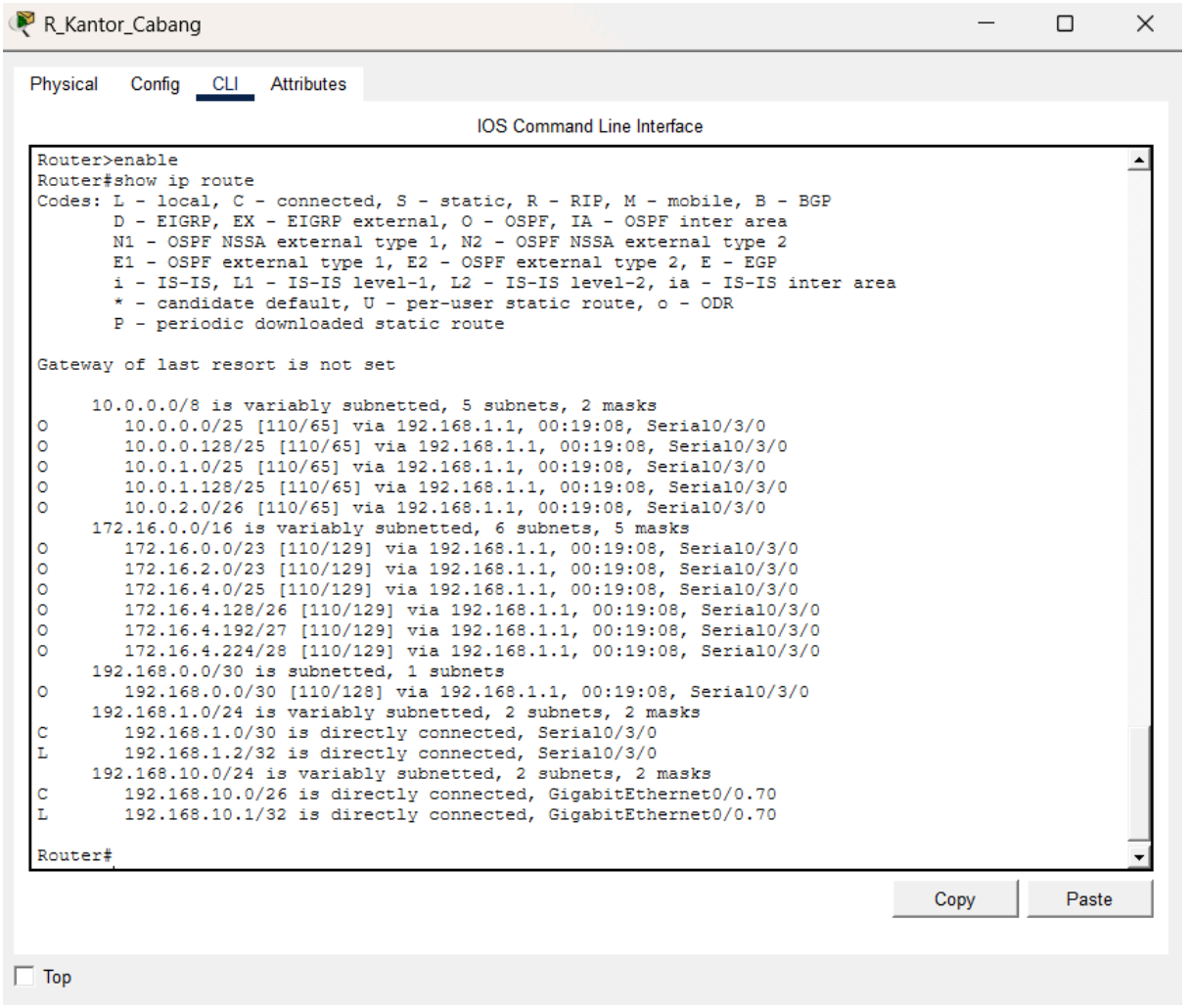


Hasil OSPF nya yang O depan route, itu dapet dari router lain

R ARA


R_ARA_Tech
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>enable
Router#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, E - EGP
i - IS-IS, 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
Gateway of last resort is 192.168.0.2 to network 0.0.0.0
10.0.0.0/8 is variably subnetted, 10 subnets, 3 masks
C 10.0.0.0/25 is directly connected, GigabitEthernet0/0.100
L 10.0.0.1/32 is directly connected, GigabitEthernet0/0.100
C 10.0.0.128/25 is directly connected, GigabitEthernet0/0.200
L 10.0.0.129/32 is directly connected, GigabitEthernet0/0.200
C 10.0.1.0/25 is directly connected, GigabitEthernet0/0.300
L 10.0.1.1/32 is directly connected, GigabitEthernet0/0.300
C 10.0.1.128/25 is directly connected, GigabitEthernet0/0.400
L 10.0.1.129/32 is directly connected, GigabitEthernet0/0.400
C 10.0.2.0/26 is directly connected, GigabitEthernet0/0.500
L 10.0.2.1/32 is directly connected, GigabitEthernet0/0.500
172.16.0.0/16 is variably subnetted, 6 subnets, 5 masks
O 172.16.0.0/23 [110/65] via 192.168.0.2, 00:18:49, Serial0/3/0
O 172.16.2.0/23 [110/65] via 192.168.0.2, 00:18:49, Serial0/3/0
O 172.16.4.0/25 [110/65] via 192.168.0.2, 00:18:49, Serial0/3/0
O 172.16.4.128/26 [110/65] via 192.168.0.2, 00:18:49, Serial0/3/0
O 172.16.4.192/27 [110/65] via 192.168.0.2, 00:18:49, Serial0/3/0
O 172.16.4.224/28 [110/65] via 192.168.0.2, 00:18:49, Serial0/3/0
192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.0.0/30 is directly connected, Serial0/3/0
L 192.168.0.1/32 is directly connected, Serial0/3/0
192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.1.0/30 is directly connected, Serial0/3/1
L 192.168.1.1/32 is directly connected, Serial0/3/1
192.168.10.0/26 is subnetted, 1 subnets
O 192.168.10.0/26 [110/65] via 192.168.1.2, 00:17:12, Serial0/3/1
S* 0.0.0.0/0 [1/0] via 192.168.0.2
Router#
Copy
Paste
Top

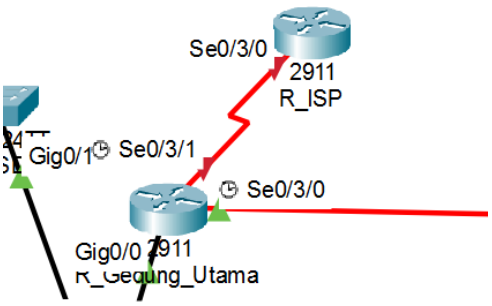
R CABANG


R_Kantor_Cabang
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>enable
Router#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, E - EGP
i - IS-IS, 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
Gateway of last resort is not set
10.0.0.0/8 is variably subnetted, 5 subnets, 2 masks
O 10.0.0.0/25 [110/65] via 192.168.1.1, 00:19:08, Serial0/3/0
O 10.0.0.128/25 [110/65] via 192.168.1.1, 00:19:08, Serial0/3/0
O 10.0.1.0/25 [110/65] via 192.168.1.1, 00:19:08, Serial0/3/0
O 10.0.1.128/25 [110/65] via 192.168.1.1, 00:19:08, Serial0/3/0
O 10.0.2.0/26 [110/65] via 192.168.1.1, 00:19:08, Serial0/3/0
172.16.0.0/16 is variably subnetted, 6 subnets, 5 masks
O 172.16.0.0/23 [110/129] via 192.168.1.1, 00:19:08, Serial0/3/0
O 172.16.2.0/23 [110/129] via 192.168.1.1, 00:19:08, Serial0/3/0
O 172.16.4.0/25 [110/129] via 192.168.1.1, 00:19:08, Serial0/3/0
O 172.16.4.128/26 [110/129] via 192.168.1.1, 00:19:08, Serial0/3/0
O 172.16.4.192/27 [110/129] via 192.168.1.1, 00:19:08, Serial0/3/0
O 172.16.4.224/28 [110/129] via 192.168.1.1, 00:19:08, Serial0/3/0
192.168.0.0/30 is subnetted, 1 subnets
O 192.168.0.0/30 [110/128] via 192.168.1.1, 00:19:08, Serial0/3/0
192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.1.0/30 is directly connected, Serial0/3/0
L 192.168.1.2/32 is directly connected, Serial0/3/0
192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.10.0/26 is directly connected, GigabitEthernet0/0.70
L 192.168.10.1/32 is directly connected, GigabitEthernet0/0.70
Router#
Copy
Paste
Top

Nomer 6 (NAT)

NAT OVERLOAD (PAT) + INTERNET ACCESS

Konfigurasi ISP



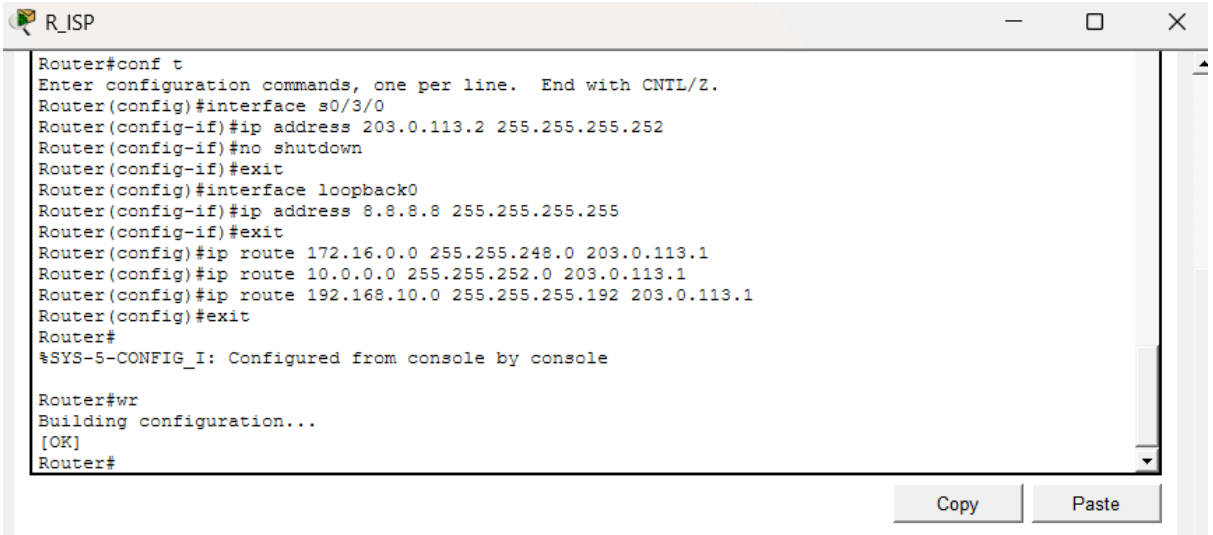
R ISP

conf t

interface s0/3/0
 ip address 203.0.113.2 255.255.255.252
 no shutdown

interface loopback0
 ip address 8.8.8.8 255.255.255.255

ip route 172.16.0.0 255.255.248.0 203.0.113.1
ip route 10.0.0.0 255.255.252.0 203.0.113.1
ip route 192.168.10.0 255.255.255.192 203.0.113.1



Konfigurasi NAT

ROUTER GEDUNG UTAMA

conf t

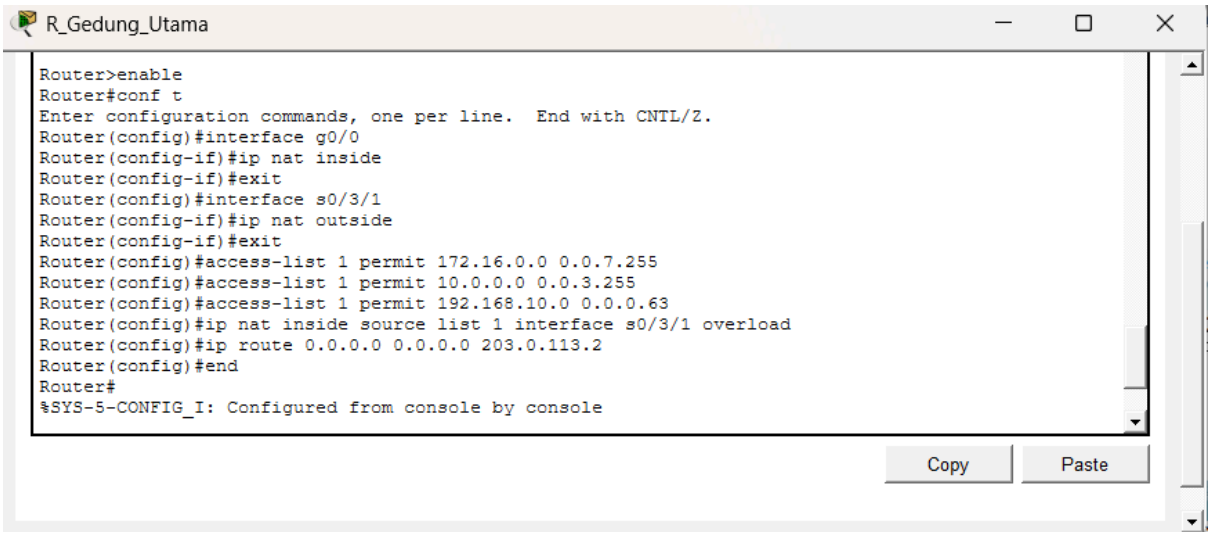
interface g0/0
 ip nat inside

interface s0/3/1
 ip nat outside

access-list 1 permit 172.16.0.0 0.0.7.255
access-list 1 permit 10.0.0.0 0.0.3.255
access-list 1 permit 192.168.10.0 0.0.0.63

ip nat inside source list 1 interface s0/3/1 overload

ip route 0.0.0.0 0.0.0.0 203.0.113.2



conf t

interface g0/0.10
 ip nat inside

interface g0/0.20
 ip nat inside

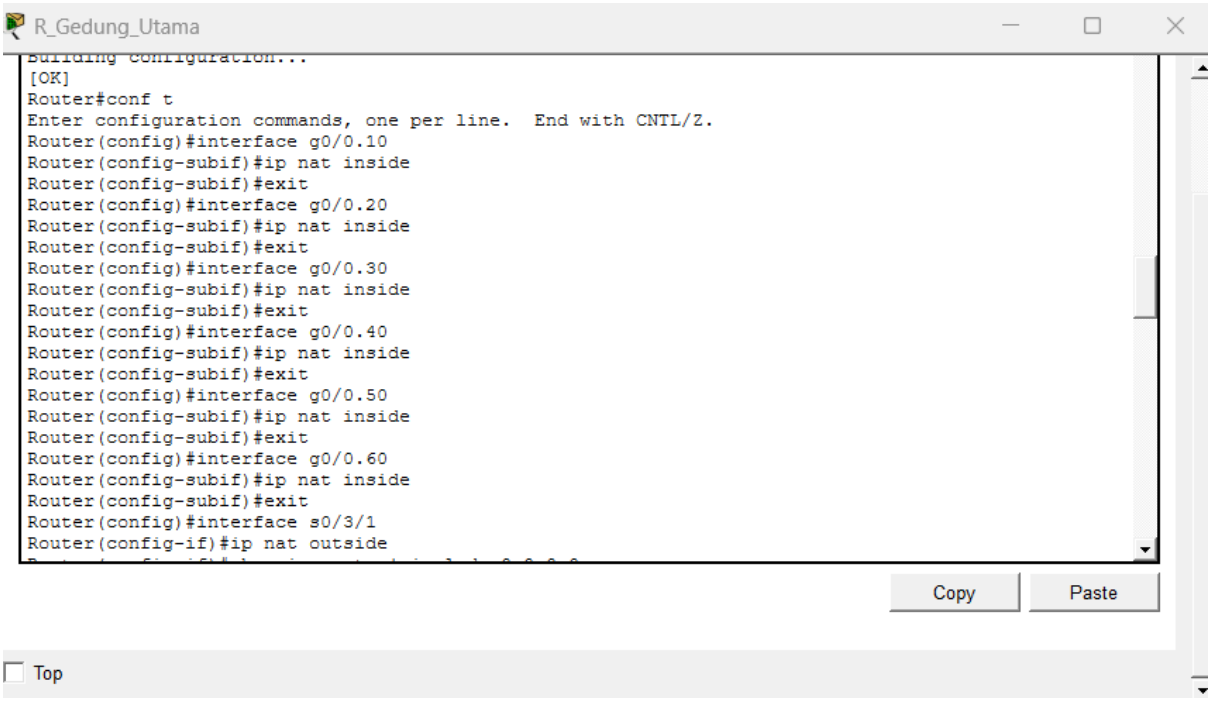
interface g0/0.30
 ip nat inside

interface g0/0.40
 ip nat inside

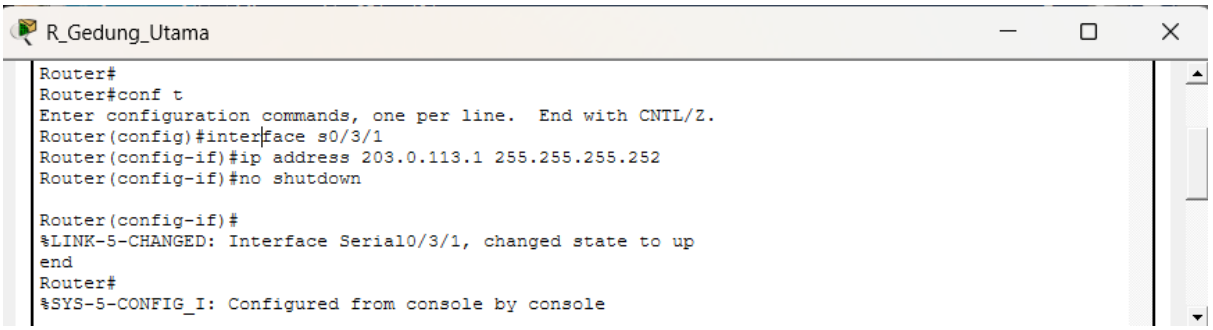
interface g0/0.50
 ip nat inside

interface g0/0.60
 ip nat inside

interface s0/3/1
 ip nat outside

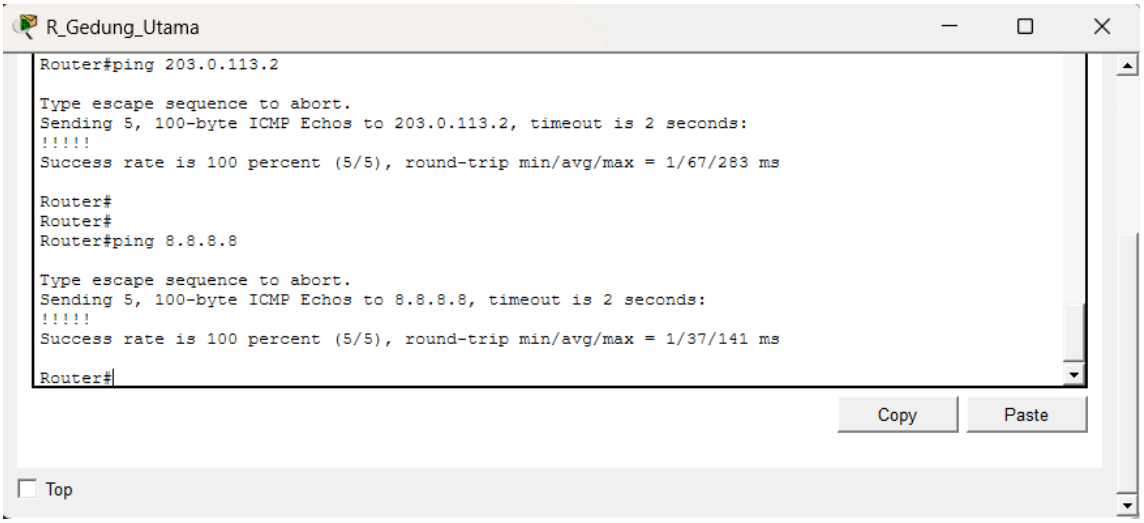


interface s0/3/1
ip address 203.0.113.1 255.255.255.252
no shutdown



Testing Internet

Router > Internet



PC > Internet

PC SDM (Gedung Utama)

```
C:\>ping 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:

Reply from 8.8.8.8: bytes=32 time=1ms TTL=254
Reply from 8.8.8.8: bytes=32 time=2ms TTL=254
Reply from 8.8.8.8: bytes=32 time=1ms TTL=254
Reply from 8.8.8.8: bytes=32 time=1ms TTL=254

Ping statistics for 8.8.8.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms
```

PC CustService (ARA)

```
C:\>ping 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:

Reply from 8.8.8.8: bytes=32 time=12ms TTL=253
Reply from 8.8.8.8: bytes=32 time=2ms TTL=253
Reply from 8.8.8.8: bytes=32 time=2ms TTL=253
Reply from 8.8.8.8: bytes=32 time=2ms TTL=253

Ping statistics for 8.8.8.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 12ms, Average = 4ms
```

Bukti PAT

```
Router#show ip nat translations
Pro  Inside global     Inside local       Outside local      Outside global
icmp 203.0.113.1:21    172.16.4.11:21     8.8.8.8:21         8.8.8.8:21
icmp 203.0.113.1:22    172.16.4.11:22     8.8.8.8:22         8.8.8.8:22
icmp 203.0.113.1:23    172.16.4.11:23     8.8.8.8:23         8.8.8.8:23
```

Nomer 7 (GRE Tunnel)

GRE Tunnel

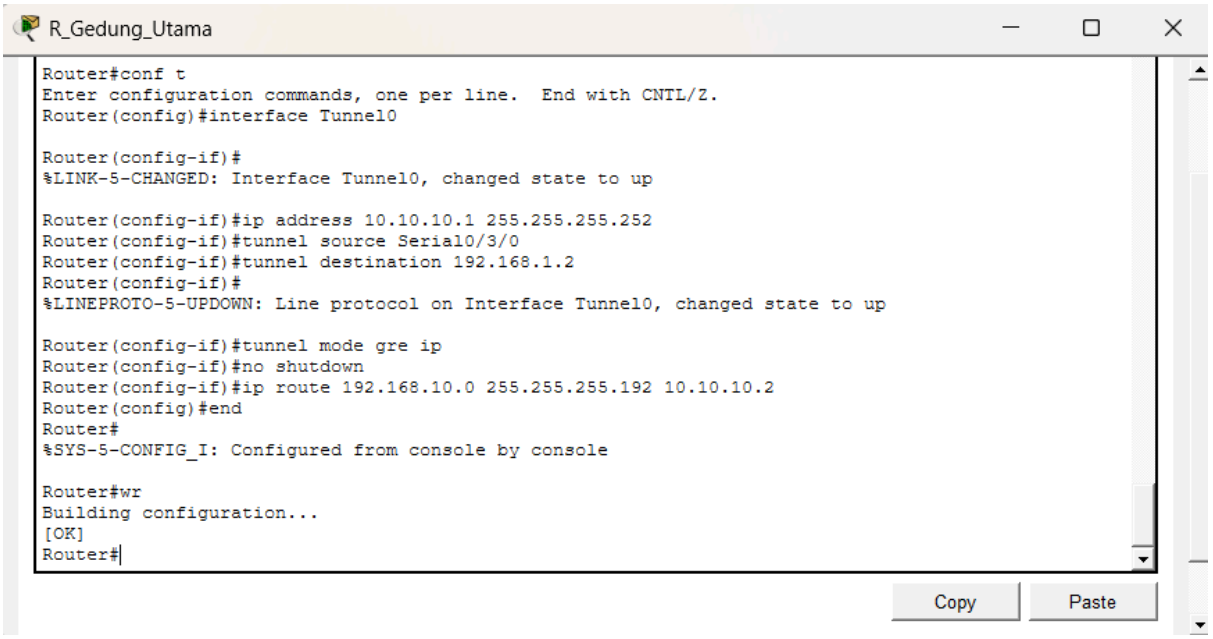
ROUTER GEDUNG UTAMA

conf t

interface Tunnel0
 ip address 10.10.10.1 255.255.255.252
 tunnel source Serial0/3/0
 tunnel destination 192.168.1.2
 tunnel mode gre ip
 no shutdown

Route Lewat Tunnel

ip route 192.168.10.0 255.255.255.192 10.10.10.2



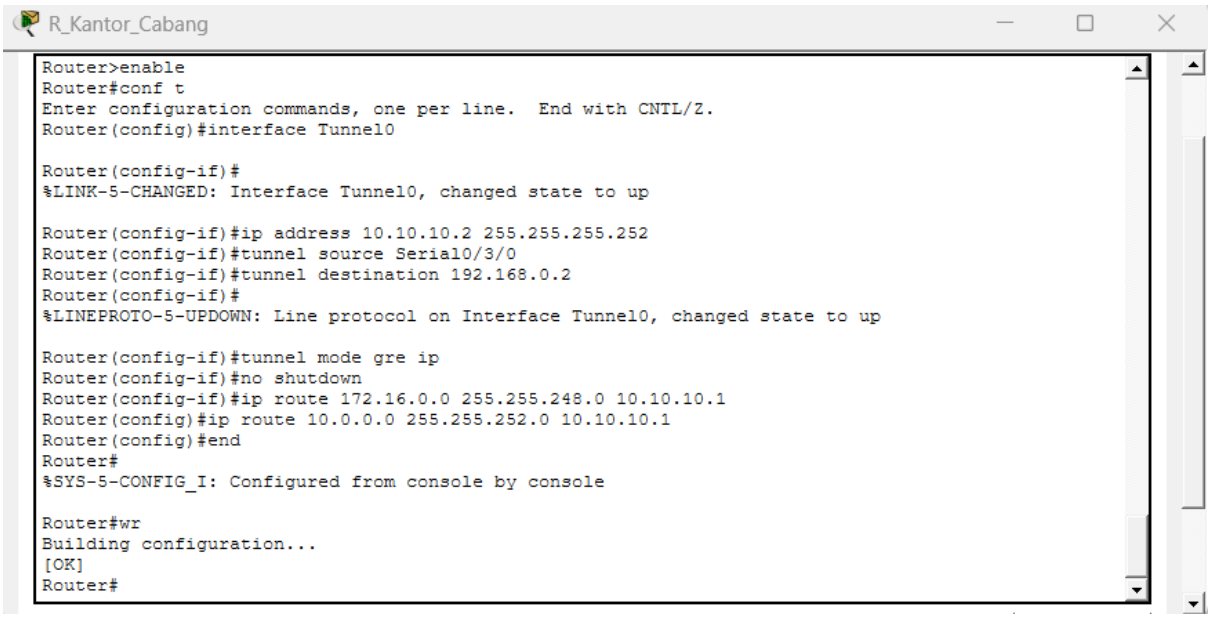
ROUTER GEDUNG CABANG

conf t

interface Tunnel0
 ip address 10.10.10.2 255.255.255.252
 tunnel source Serial0/3/0
 tunnel destination 192.168.0.2
 tunnel mode gre ip
 no shutdown

Route Lewat Tunnel

ip route 172.16.0.0 255.255.248.0 10.10.10.1
ip route 10.0.0.0 255.255.252.0 10.10.10.1



Testing GRE

Cek Status Tunnel

R_Kantor_Cabang

```
Router#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  up                    up
GigabitEthernet0/0.70  192.168.10.1    YES manual up                    up
GigabitEthernet0/1     unassigned      YES unset  administratively down down
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Serial0/3/0            192.168.1.2     YES manual up                    up
Serial0/3/1            unassigned      YES unset  administratively down down
Tunnel0                10.10.10.2      YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down
Router#
```

R_Gedung_Utama

```
Router#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  up                    up
GigabitEthernet0/0.10  172.16.4.1      YES manual up                    up
GigabitEthernet0/0.20  172.16.2.1      YES manual up                    up
GigabitEthernet0/0.30  172.16.4.129    YES manual up                    up
GigabitEthernet0/0.40  172.16.4.193    YES manual up                    up
GigabitEthernet0/0.50  172.16.4.225    YES manual up                    up
GigabitEthernet0/0.60  172.16.0.1      YES manual up                    up
GigabitEthernet0/1     unassigned      YES unset  administratively down down
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Serial0/3/0            192.168.0.2     YES manual up                    up
Serial0/3/1            203.0.113.1     YES manual up                    up
Tunnel0                10.10.10.1      YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down
Router#
```

Di keduanya si Tunnel0 udah yes manual up

Ping Antar Tunnel

R_Kantor_Cabang

```
Router#ping 10.10.10.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.10.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 10/35/106 ms

Router#
```

R_Gedung_Utama

```
Router#ping 10.10.10.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.10.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 3/38/130 ms

Router#
```

Ping Antar PC Tunnel

PC SDM (Gedung Utama) > PC Regional (Cabang)

```
C:\>ping 192.168.10.11

Pinging 192.168.10.11 with 32 bytes of data:

Reply from 192.168.10.11: bytes=32 time=12ms TTL=126
Reply from 192.168.10.11: bytes=32 time=2ms TTL=126
Reply from 192.168.10.11: bytes=32 time=2ms TTL=126
Reply from 192.168.10.11: bytes=32 time=3ms TTL=126

Ping statistics for 192.168.10.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 12ms, Average = 4ms
```

PC Regional (Cabang) > PC SDM (Gedung Utama)

```
C:\>ping 172.16.4.11

Pinging 172.16.4.11 with 32 bytes of data:

Reply from 172.16.4.11: bytes=32 time=2ms TTL=126
Reply from 172.16.4.11: bytes=32 time=2ms TTL=126
Reply from 172.16.4.11: bytes=32 time=3ms TTL=126
Reply from 172.16.4.11: bytes=32 time=11ms TTL=126

Ping statistics for 172.16.4.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 11ms, Average = 4ms
```

Tambahan notes:

"Walaupun OSPF telah digunakan antar gedung, GRE Tunnel tetap dikonfigurasikan untuk mensimulasikan koneksi virtual point-to-point yang aman antara Gedung Utama dan Kantor Cabang."