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Dokumentasi Hasil Praktikum

Diagram/Topologi Jaringan

- Gambar atau skema topologi jaringan yang digunakan dalam praktikum VLAN & Trunking.
- [Topologi Jaringan](#)

Dokumentasi Perhitungan Subnet & Alokasi IP

- Tabel perhitungan subnet untuk masing-masing VLAN:

VLAN	Network Address	Broadcast Address	Host Range	Keterangan
10	192.168.10.0	192.168.10.31	192.168.10.1-30	Subnet /27 untuk VLAN 10
20	192.168.20.0	192.168.20.31	192.168.20.1-30	Subnet /27 untuk VLAN 20
...

- Penjelasan alokasi IP dan pembagian subnet sesuai kebutuhan jaringan.

Screenshot Konfigurasi

- **Konfigurasi VLAN pada Switch:**
 - Konfigurasi pembuatan VLAN.
 - Port assignment dan set-up trunk.
 - Contoh perintah konfigurasi:

```
vlan 10
name Marketing
exit
interface GigabitEthernet0/1
switchport mode trunk
switchport trunk allowed vlan 10,20
```

- **Konfigurasi Sub-interface pada Router (Jika Digunakan):**
 - Pengaturan sub-interface dan IP Address.

```
interface GigabitEthernet0/0.10
encapsulation dot1Q 10
ip address 192.168.10.1 255.255.255.224
```

- **Konfigurasi IP Address:**

- Sesuaikan dengan perhitungan subnet masing-masing VLAN.

Hasil Uji Konektivitas

- Sertakan screenshot hasil pengujian ping lintas VLAN.
- Contoh output CLI dari perintah ping:

```
ping 192.168.20.1
```

```
Reply from 192.168.20.1: bytes=32 time=2ms TTL=64
```

```
Reply from 192.168.20.1: bytes=32 time=2ms TTL=64
```

Perbandingan FLSM dan CIDR

Fixed Length Subnet Mask (FLSM)

- Menggunakan panjang subnet mask yang sama untuk semua subnet dalam jaringan
- Membagi jaringan menjadi subnet dengan ukuran yang identik
- Sederhana untuk implementasi dan pemahaman
- Kurang efisien dalam penggunaan alamat IP karena setiap subnet mendapat jumlah alamat yang sama terlepas dari kebutuhan

Classless Inter-Domain Routing (CIDR)

- Memungkinkan subnet mask dengan panjang variabel sesuai kebutuhan
- Subnet dapat memiliki ukuran yang berbeda-beda
- Lebih efisien dalam penggunaan alamat IP karena alokasi berdasarkan kebutuhan aktual
- Memungkinkan agregasi rute yang lebih baik, mengurangi ukuran tabel routing
- Implementasi lebih kompleks tetapi memberikan fleksibilitas yang lebih tinggi

Pada praktikum ini, pendekatan FLSM digunakan dengan subnet /27 untuk semua VLAN, namun dalam jaringan yang lebih kompleks, CIDR dapat memberikan efisiensi yang lebih baik.

Konsep VLAN dan Trunking

Virtual LAN (VLAN)

- VLAN merupakan pembagian segmen logis dalam jaringan meskipun perangkat berada di lokasi fisik yang sama.
- Membantu pemisahan domain siaran, meningkatkan keamanan, serta mengoptimalkan kinerja jaringan.
- Setiap VLAN beroperasi secara independen, meminimalkan broadcast yang tidak perlu.

Trunking

- Trunking adalah metode untuk mengirimkan beberapa VLAN sekaligus pada satu koneksi fisik antara switch atau perangkat jaringan lain.

- Menggunakan tagging (misalnya, IEEE 802.1Q) untuk menandai setiap frame agar penerima mengetahui VLAN asalnya.
- Memudahkan manajemen jaringan dengan mengurangi jumlah kabel dan port yang diperlukan untuk menghubungkan banyak VLAN.

Tautan Hasil Simulasi

- [GitHub Profile](#)
- Simulasi dalam format PDF dan file .pkt dapat diakses melalui link tersebut.

Konfigurasi IP pada PC:

PC0 (VLAN 10):

IP: 192.168.10.10

Subnet Mask: 255.255.255.224

Gateway: 192.168.10.1

PC1 (VLAN 10):

IP: 192.168.10.20

Subnet Mask: 255.255.255.224

Gateway: 192.168.10.1

PC2 (VLAN 20):

IP: 192.168.10.34

Subnet Mask: 255.255.255.224

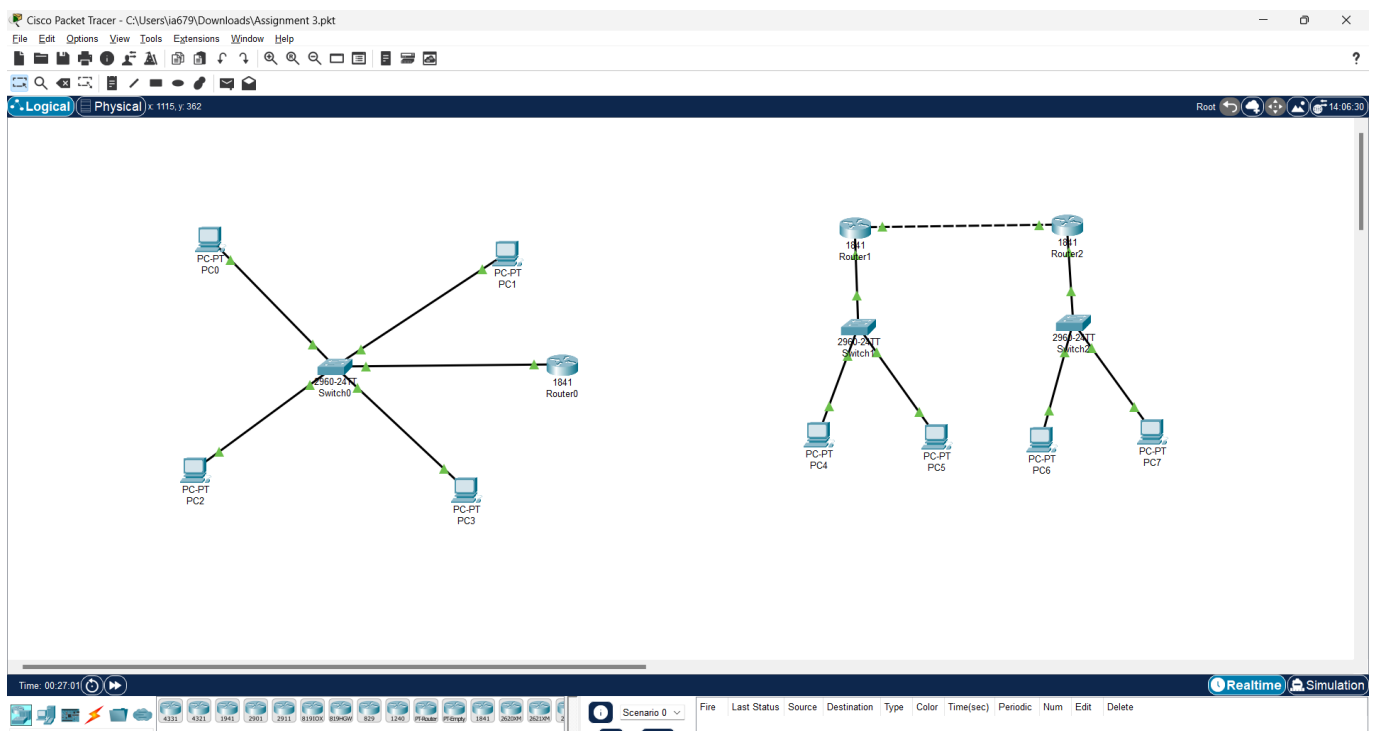
Gateway: 192.168.10.33

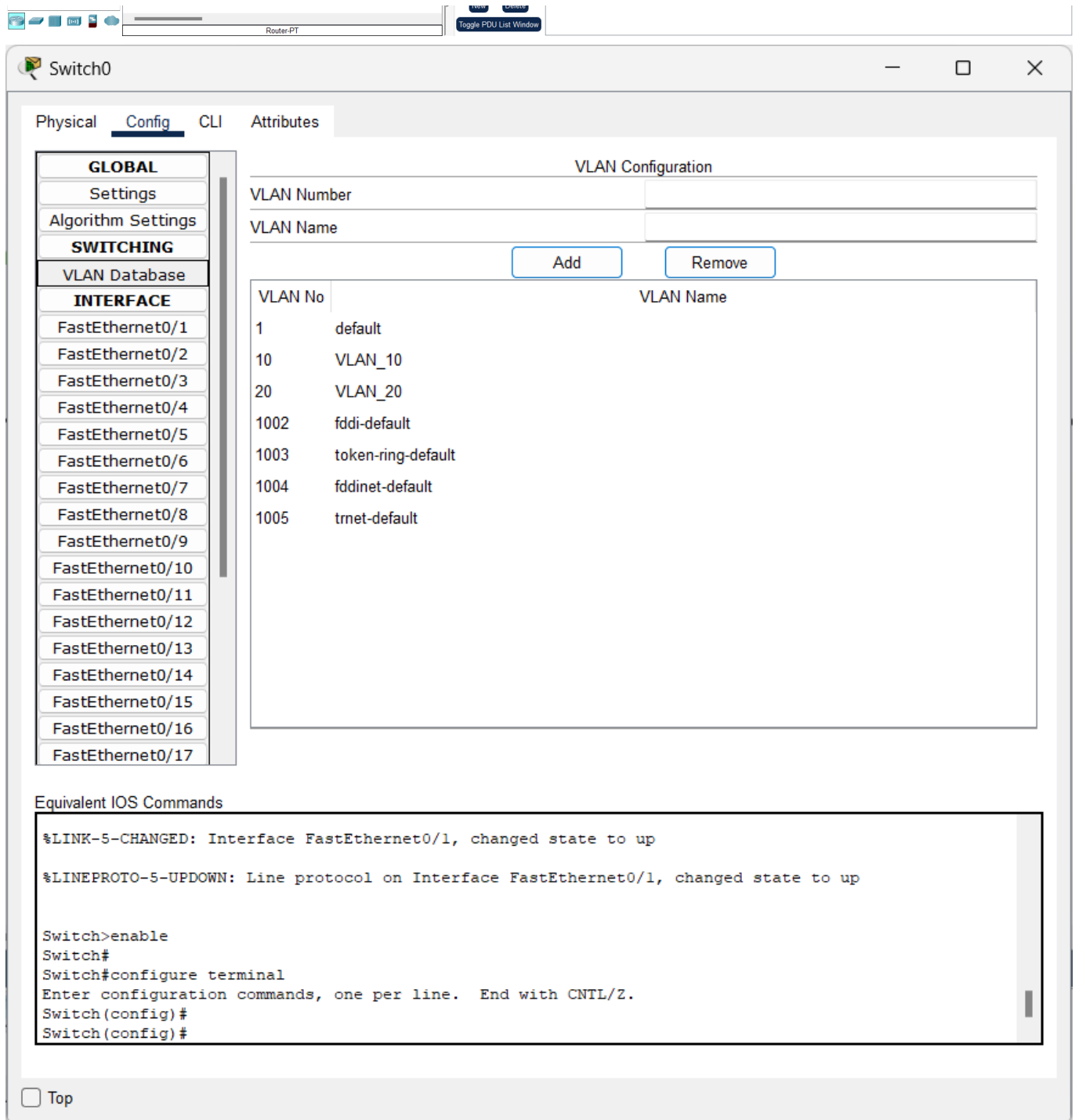
PC3 (VLAN 20):

IP: 192.168.10.44

Subnet Mask: 255.255.255.224

Gateway: 192.168.10.33





Router-PT

Toggle PDU List Window

Switch0

Physical **Config** CLI Attributes

GLOBAL

- Settings
- Algorithm Settings

SWITCHING

- VLAN Database**

INTERFACE

- FastEthernet0/1
- FastEthernet0/2
- FastEthernet0/3
- FastEthernet0/4
- FastEthernet0/5
- FastEthernet0/6
- FastEthernet0/7
- FastEthernet0/8
- FastEthernet0/9
- FastEthernet0/10
- FastEthernet0/11
- FastEthernet0/12
- FastEthernet0/13
- FastEthernet0/14
- FastEthernet0/15
- FastEthernet0/16
- FastEthernet0/17

VLAN Configuration

VLAN Number

VLAN Name

Add Remove

VLAN No	VLAN Name
1	default
10	VLAN_10
20	VLAN_20
1002	fddi-default
1003	token-ring-default
1004	fddinet-default
1005	trnet-default

Equivalent IOS Commands

```
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Switch>enable
Switch#
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
Switch(config)#
```

☐ Top

Switch0

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/11

FastEthernet0/12

FastEthernet0/13

FastEthernet0/14

FastEthernet0/15

FastEthernet0/16

FastEthernet0/17

FastEthernet0/1

Port Status

Bandwidth

Duplex

Trunk

VLAN

1-1005

Tx Ring Limit

10

100 Mbps

10 Mbps

Half Duplex

Full Duplex

On

Auto

Auto

Equivalent IOS Commands

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Switch>enable
Switch#
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#
Switch(config)#
Switch(config)#interface FastEthernet0/1
Switch(config-if)#
```

☐ Top

Switch0

Physical Config

GLOBAL

Settings

Algorithm Sett

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/11

FastEthernet0/12

FastEthernet0/13

FastEthernet0/14

FastEthernet0/15

FastEthernet0/16

FastEthernet0/17

Sn

Screen Autom

Switch1

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/11

FastEthernet0/12

FastEthernet0/13

FastEthernet0/14

FastEthernet0/15

FastEthernet0/16

FastEthernet0/17

VLAN Configuration

VLAN Number

VLAN Name

Add

Remove


VLAN No	VLAN Name
1	default
30	vlan_30
1002	fddi-default
1003	token-ring-default
1004	fddinet-default
1005	trnet-default

Equivalent IOS Commands

```
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

Switch>enable
Switch#
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
Switch(config)#
```

☐ Top

 Switch2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/11

FastEthernet0/12

FastEthernet0/13

FastEthernet0/14

FastEthernet0/15

FastEthernet0/16

FastEthernet0/17

VLAN Configuration

VLAN Number

VLAN Name

Add

Remove

VLAN No	VLAN Name
1	default
40	vlan_40
1002	fddi-default
1003	token-ring-default
1004	fddinet-default
1005	trnet-default

Equivalent IOS Commands

```
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

Switch>enable
Switch#
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
Switch(config)#
```

☐ Top

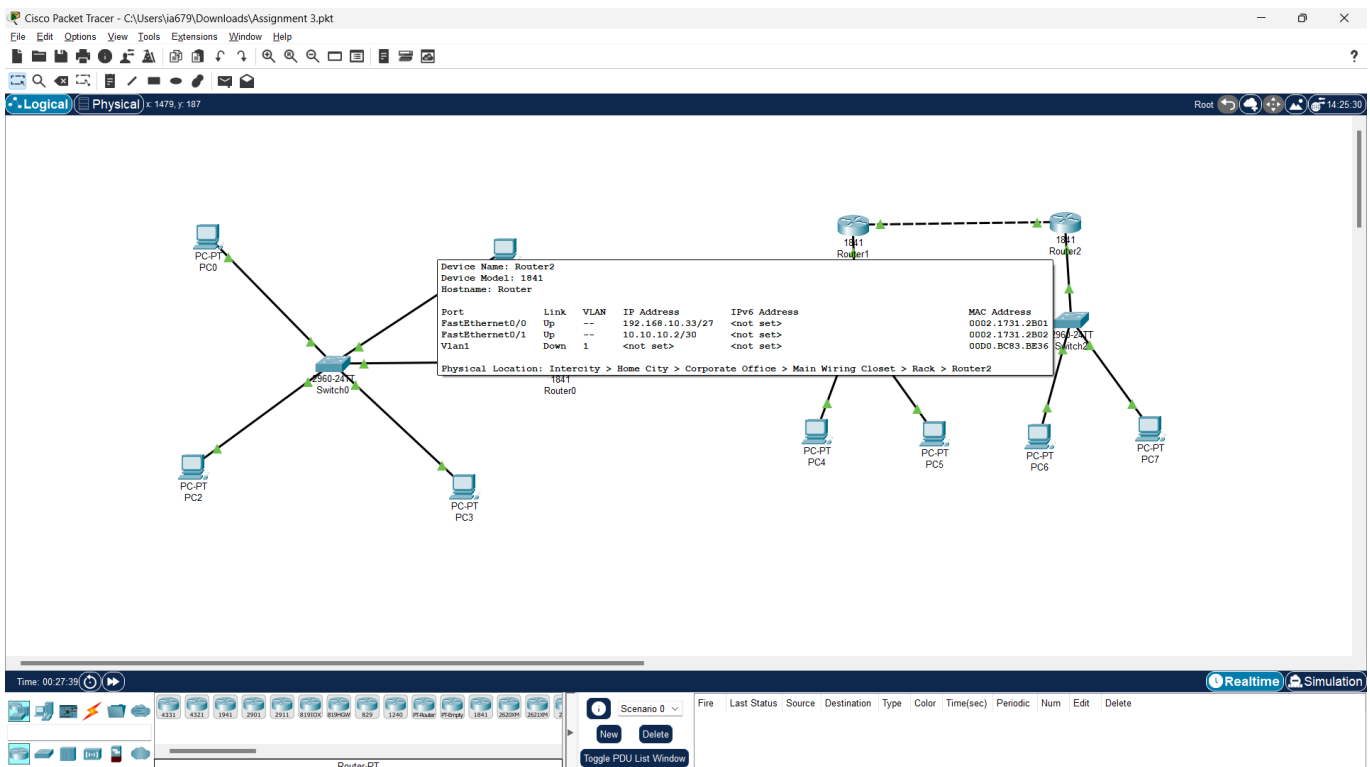
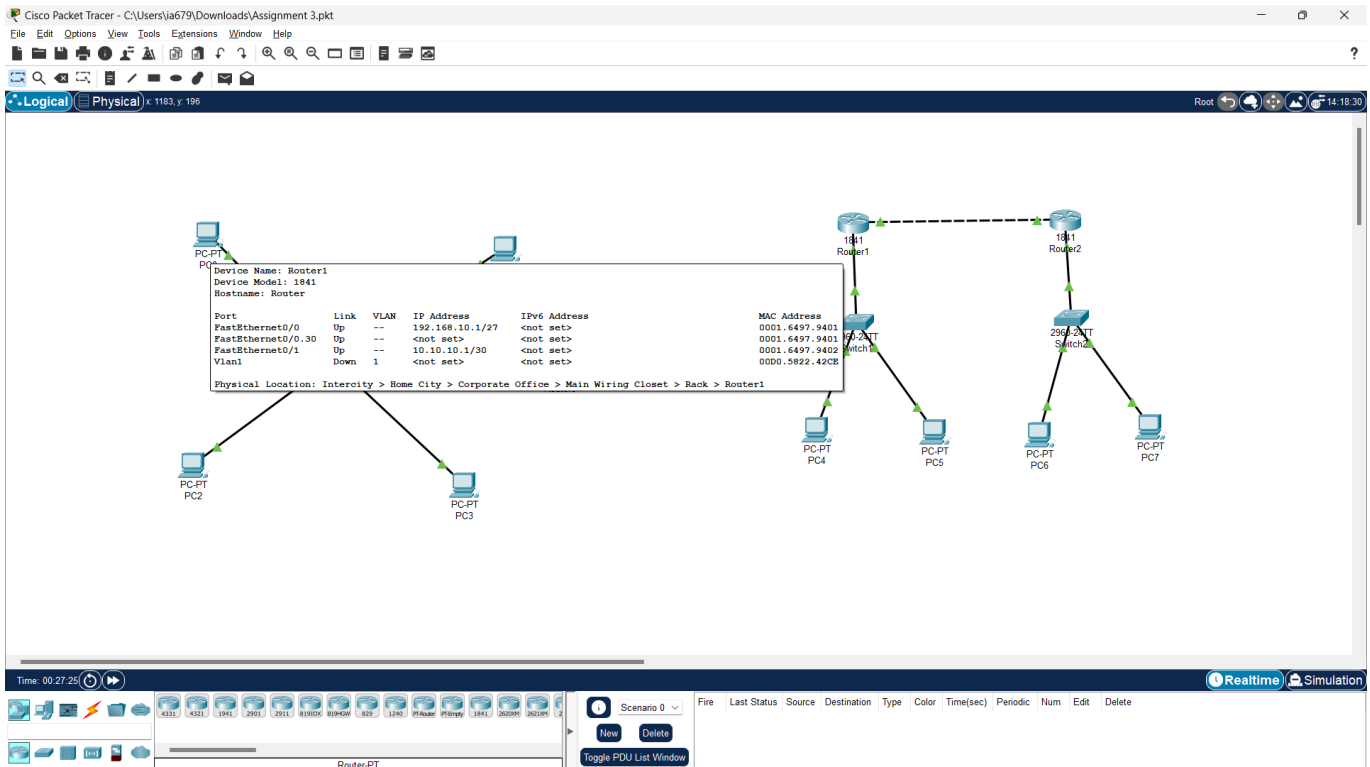
Device Name: Router0

Device Model: 1841

Hostname: Router

Port	Link	VLAN	IP Address	IPv6 Address	MAC Address
FastEthernet0/0	Up	--	<not set>	<not set>	00E0.F718.3B01
FastEthernet0/0.10	Up	--	192.168.10.1/27	<not set>	00E0.F718.3B01
FastEthernet0/0.20	Up	--	192.168.10.33/27	<not set>	00E0.F718.3B01
FastEthernet0/1	Up	--	<not set>	<not set>	00E0.F718.3B02
Vlan1	Down	1	<not set>	<not set>	0003.E485.0365

Physical Location: Intercity > Home City > Corporate Office > Main Wiring Closet > Rack > Router0



PC0

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.10.10

Subnet Mask 255.255.255.224

Default Gateway 192.168.10.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::2D0:58FF:FE01:C010

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

☐ Top

PC2

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.10.34

Subnet Mask 255.255.255.224

Default Gateway 192.168.10.33

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::2E0:58FF:FE1E:AB6E

Link Local Address

1260...2E0...91...E...AD0E

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication

MD5

Username

Password

☐ Top

PC4

Physical

Config

Desktop

Programming

Attributes

IP Configuration

X

Interface

FastEthernet0

IP Configuration

DHCP

Static

IPv4 Address

192.168.10.10

Subnet Mask

255.255.255.224

Default Gateway

192.168.10.1

DNS Server

0.0.0.0

IPv6 Configuration

Automatic

Static

IPv6 Address

/

Link Local Address

FE80::201:C7FF:FEC6:A430

Default Gateway

DNS Server

802.1X

Use 802.1X Security

Authentication

MD5

Username

Password

Top

PC6

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.10.34

Subnet Mask 255.255.255.224

Default Gateway 192.168.10.33

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::2E0:8FFF:FEE5:8464

Default Gateway

DNS Server

802.1X

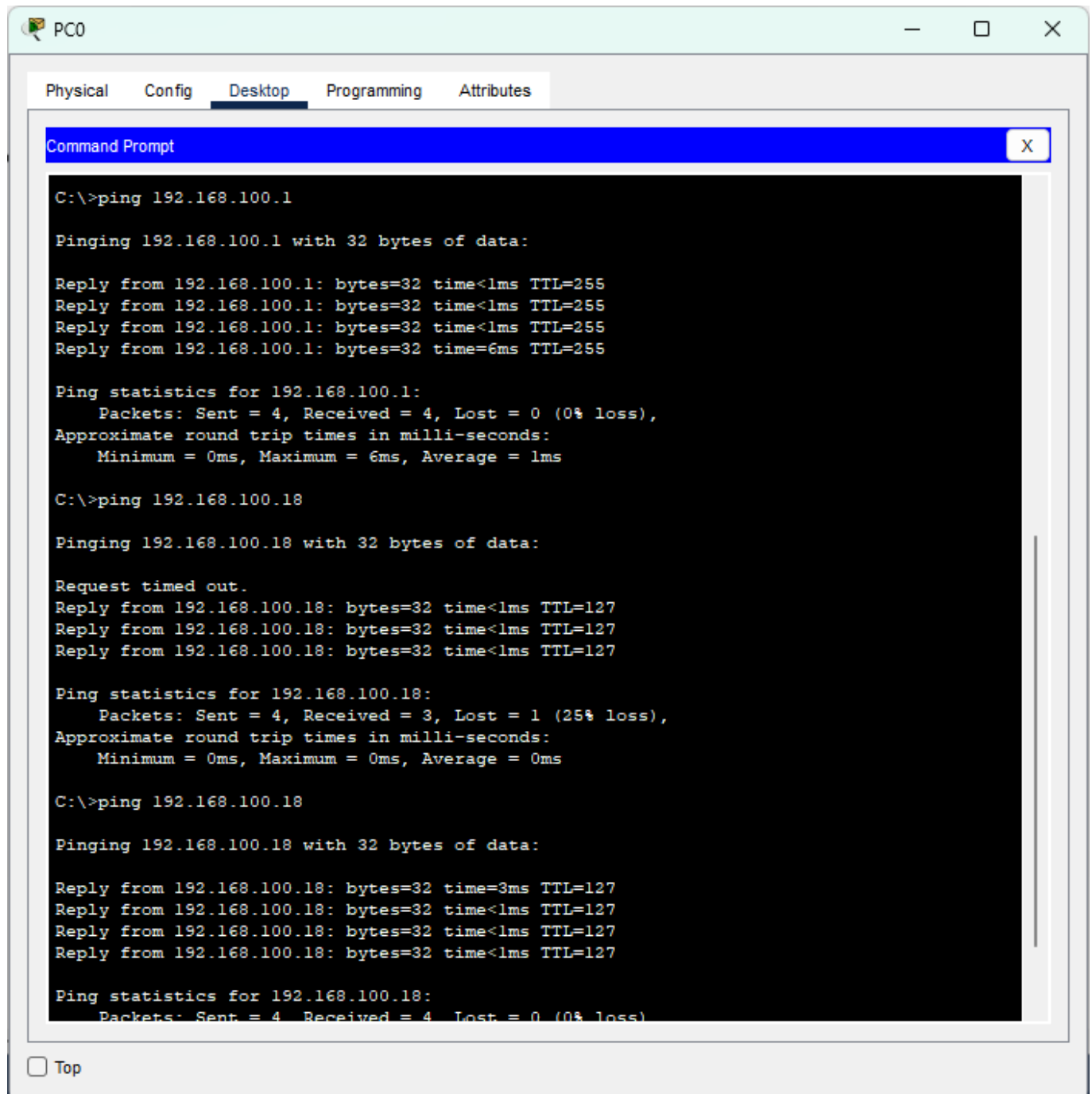
☐ Use 802.1X Security

Authentication MD5

Username

Password

☐ Top



PC0

Physical Config **Desktop** Programming Attributes

Command Prompt

```
C:\>ping 192.168.100.1

Pinging 192.168.100.1 with 32 bytes of data:

Reply from 192.168.100.1: bytes=32 time<1ms TTL=255
Reply from 192.168.100.1: bytes=32 time<1ms TTL=255
Reply from 192.168.100.1: bytes=32 time<1ms TTL=255
Reply from 192.168.100.1: bytes=32 time=6ms TTL=255

Ping statistics for 192.168.100.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 6ms, Average = 1ms

C:\>ping 192.168.100.18

Pinging 192.168.100.18 with 32 bytes of data:

Request timed out.
Reply from 192.168.100.18: bytes=32 time<1ms TTL=127
Reply from 192.168.100.18: bytes=32 time<1ms TTL=127
Reply from 192.168.100.18: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.100.18:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

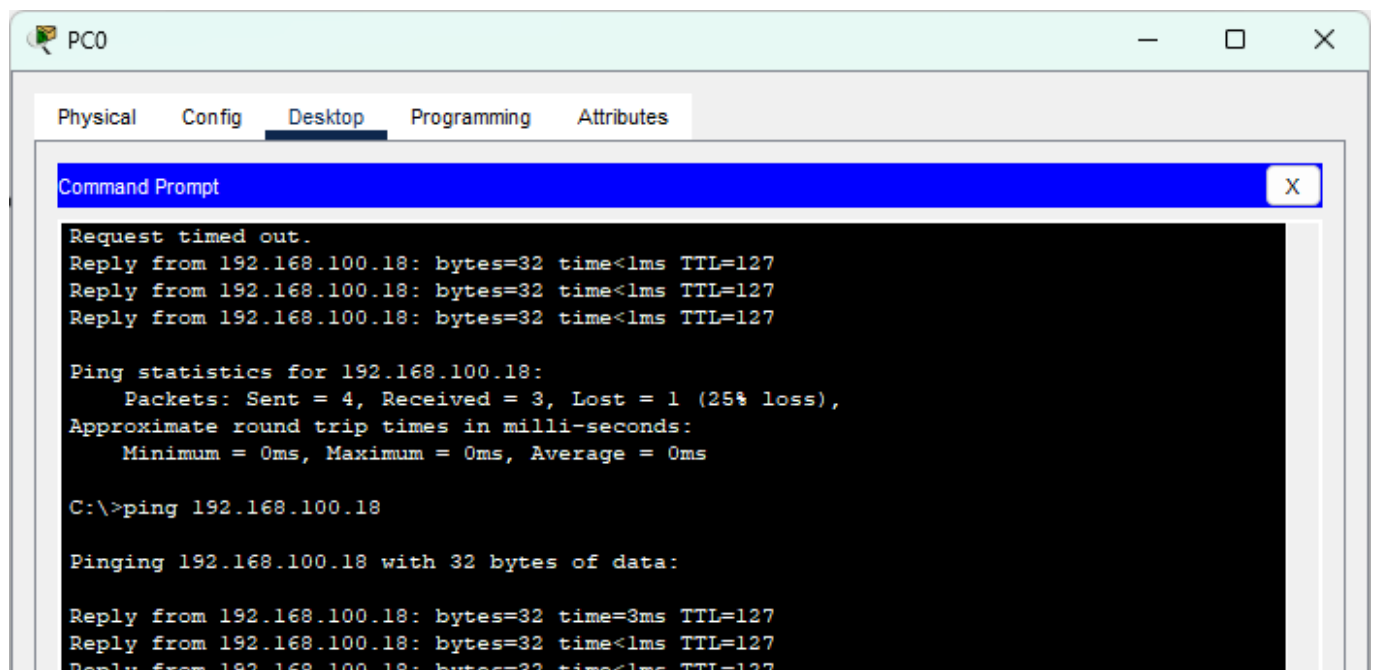
C:\>ping 192.168.100.18

Pinging 192.168.100.18 with 32 bytes of data:

Reply from 192.168.100.18: bytes=32 time=3ms TTL=127
Reply from 192.168.100.18: bytes=32 time<1ms TTL=127
Reply from 192.168.100.18: bytes=32 time<1ms TTL=127
Reply from 192.168.100.18: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.100.18:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss)
```

☐ Top



PC0

Physical Config **Desktop** Programming Attributes

Command Prompt

```
Request timed out.
Reply from 192.168.100.18: bytes=32 time<1ms TTL=127
Reply from 192.168.100.18: bytes=32 time<1ms TTL=127
Reply from 192.168.100.18: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.100.18:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.100.18

Pinging 192.168.100.18 with 32 bytes of data:

Reply from 192.168.100.18: bytes=32 time=3ms TTL=127
Reply from 192.168.100.18: bytes=32 time<1ms TTL=127
Reply from 192.168.100.18: bytes=32 time<1ms TTL=127
```



```
Reply from 192.168.100.18: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.100.18:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 0ms

C:\>ping 192.168.100.34

Pinging 192.168.100.34 with 32 bytes of data:

Request timed out.
Reply from 192.168.100.34: bytes=32 time=6ms TTL=127
Reply from 192.168.100.34: bytes=32 time<1ms TTL=127
Reply from 192.168.100.34: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.100.34:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 6ms, Average = 2ms

C:\>
```

☐ Top

