

Laporan Praktikum

Desain dan Manajemen Jaringan
Komputer

TUGAS 3
Akademik ITK



Disusun Oleh :

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 **Kriteria Penilaian**

- Konfigurasi VLAN & Trunking (40%):
 - Apakah VLAN sudah terbentuk dengan benar, port trunk diatur, dan subnet interface router sesuai.
- Alokasi IP & Subnet (30%):
 - Apakah setiap VLAN memiliki IP Address benar /27, tidak tumpang tindih.
- Uji Konektivitas & Dokumentasi (30%):
 - Ping lintas VLAN berhasil, disertai screenshot & penjelasan konfigurasi.

Jawaban

a. Menentukan Kebutuhan Jaringan

1. **Jumlah VLAN:**
 - Dua VLAN dibutuhkan untuk memisahkan dua departemen, yaitu VLAN 10 dan VLAN 20.
 - Setiap VLAN harus mampu menampung sekitar 30 host.
2. **Alamat Dasar:**
 - Alamat dasar yang digunakan adalah **192.168.10.0/24**. Ini adalah alamat jaringan utama yang akan dibagi menjadi subnet-subnet lebih kecil.
3. **Subnet Mask:**
 - Subnet mask yang digunakan adalah **/27** (255.255.255.224). Subnet mask ini memungkinkan setiap subnet menampung hingga 30 host.
4. **Skema Alamat IP:**
 - **VLAN 10:**
 - Network: 192.168.10.0/27
 - Broadcast: 192.168.10.31
 - Host Range: 192.168.10.1 – 192.168.10.30
 - **VLAN 20:**

- Network: 192.168.10.32/27
- Broadcast: 192.168.10.63
- Host Range: 192.168.10.33 – 192.168.10.62

b. Melakukan Perhitungan Subnet

- **Tabel Perhitungan Subnet:**

VLAN	Network Address	Subnet Mask	Broadcast Address	Host Range	
10	192.168.10.0	/27	192.168.10.31	192.168.10.1 192.168.10.30	—
20	192.168.10.32	/27	192.168.10.63	192.168.10.33 192.168.10.62	—

- **Penjelasan Alokasi IP:**

- Setiap VLAN memiliki subnet mask /27, yang memungkinkan 30 host per subnet.
- Tidak ada tumpang tindih antara VLAN 10 dan VLAN 20, karena mereka menggunakan segmen jaringan yang berbeda.

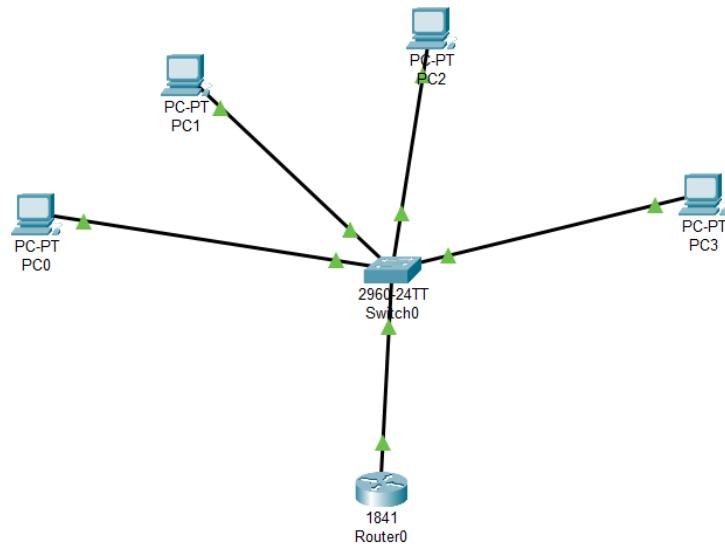
c. Membangun Topologi di Packet Tracer

Scenario 1: 1 Router, 2 VLAN/Subnet di Switch

- **Komponen:**

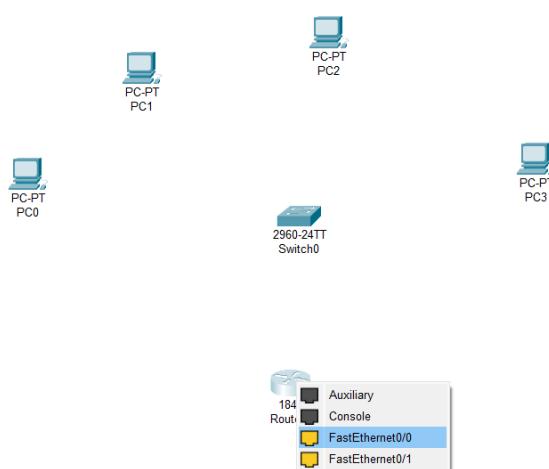
- **1 Router (Cisco Router 1841)**
- **1 Switch (Cisco Catalyst 2960)**
- **4 PC (PC0, PC1, PC2, PC3)**
- **Straight-Through Cable: Untuk menghubungkan Router ke Switch dan Switch ke PC.**
- **Topologi Star**

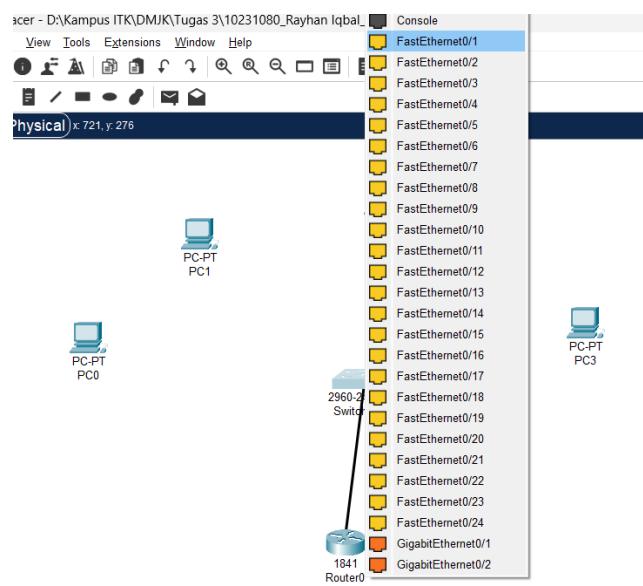
Topologi Star (Bintang) adalah salah satu jenis topologi jaringan komputer di mana semua perangkat (node) terhubung ke satu perangkat pusat, seperti switch atau hub.



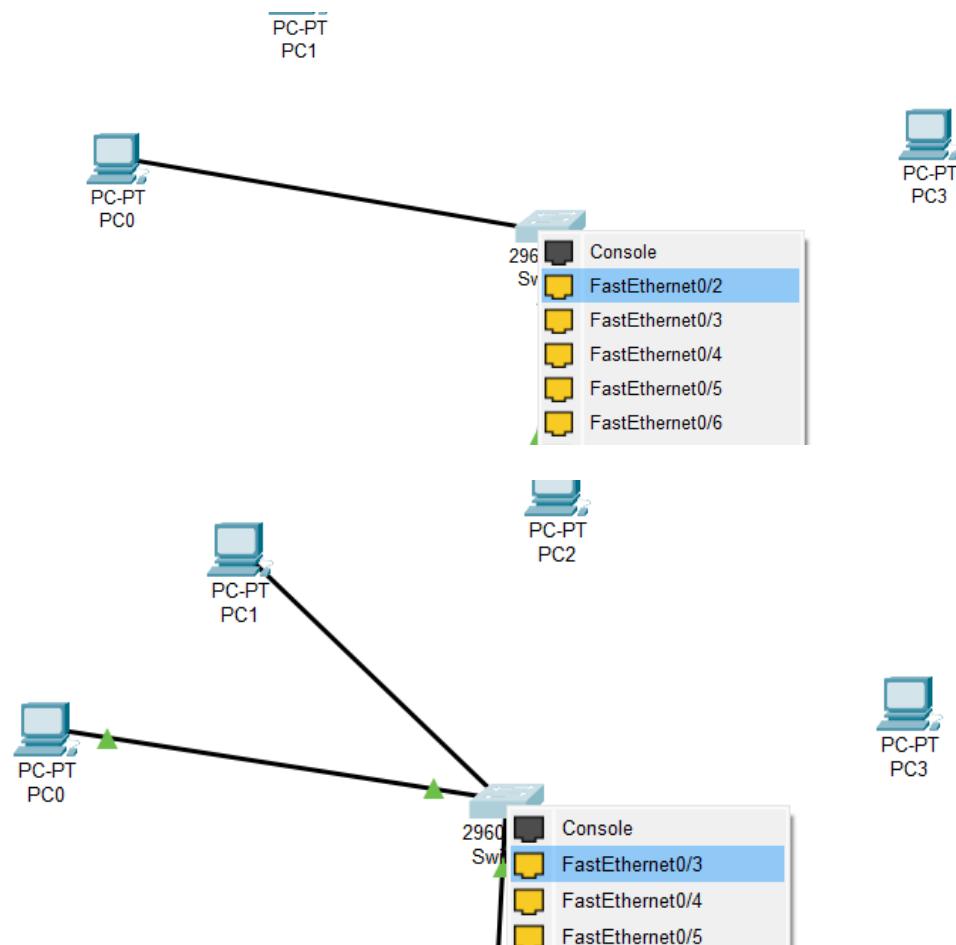
Koneksi Fisik:

- Hubungkan:
 - Router (**FastEthernet0/0**) ke Switch (**FastEthernet0/1**).

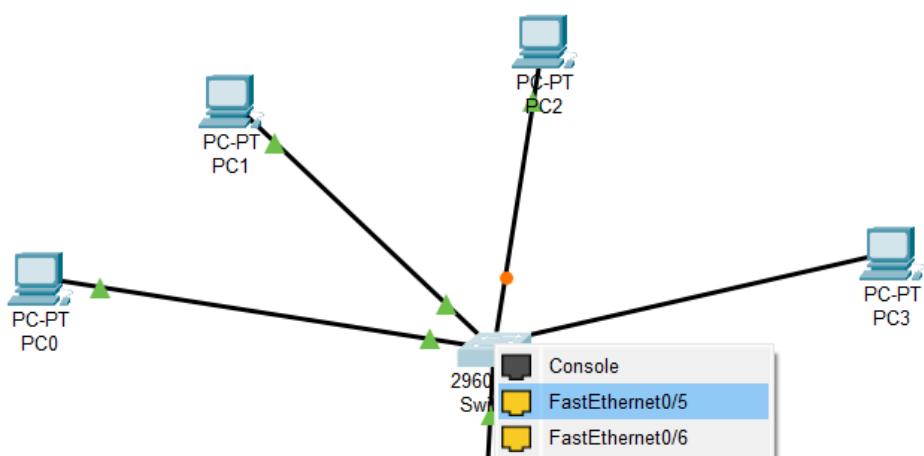
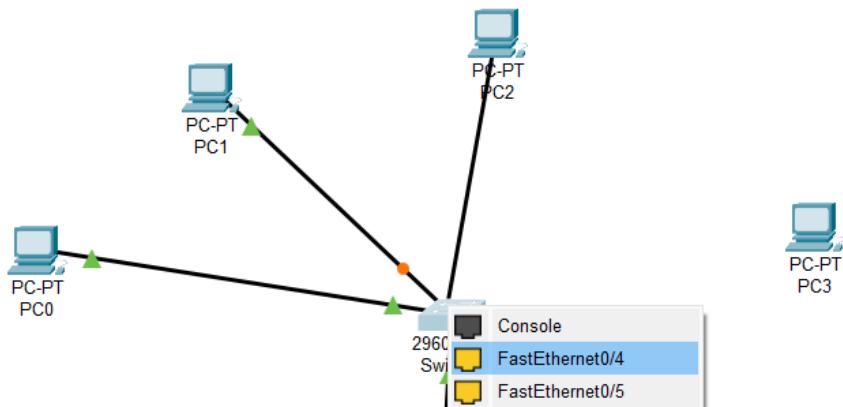




- **PC0 dan PC1 ke Switch (port FastEthernet0/2 dan FastEthernet0/3).**



- PC2 dan PC3 ke Switch (port FastEthernet0/4 dan FastEthernet0/5).



- **Konfigurasi VLAN pada Switch:**

- VLAN 10 dan VLAN 20 sudah dibuat dengan benar.
- Port yang terhubung ke PC di-assign ke VLAN yang sesuai.
- Port trunk ke router (fa0/1) sudah dikonfigurasi dengan benar.

```
Switch#enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name VLAN_10
Switch(config-vlan)#vlan 20
Switch(config-vlan)#name VLAN_20
Switch(config-vlan)#exit
Switch(config)#interface range fa0/2-3
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 10
Switch(config-if-range)#exit
Switch(config)#interface range fa0/4-5
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 20
Switch(config-if-range)#exit
Switch(config)#interface fa0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
Switch(config)#

```

Assign Port ke VLAN:

- Tentukan port mana yang akan digunakan oleh PC0, PC1, PC2, dan PC3, lalu assign port tersebut ke VLAN yang sesuai.
- Misalnya:
 - Port **fa0/2** dan **fa0/3** untuk PC0 dan PC1 (VLAN 10).
 - Port **fa0/4** dan **fa0/5** untuk PC2 dan PC3 (VLAN 20).

Konfigurasi Port Trunk:

- Port yang terhubung ke router (misalnya **fa0/1**) harus dikonfigurasi sebagai **port trunk** agar dapat membawa lalu lintas dari kedua VLAN (VLAN 10 dan VLAN 20).

• **Konfigurasi Router:**

Pastikan interface fa0/0 diaktifkan menggunakan perintah:

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fa0/0
Router(config-if)#no shutdown

Router(config-if)#exit
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config)#+
```

Konfigurasi sub-interface untuk VLAN 10 dan VLAN 20:

- Sub-interface untuk VLAN 10 (fa0/0.10) dan VLAN 20 (fa0/0.20) sudah dikonfigurasi dengan IP address dan encapsulation dot1Q yang sesuai.

```
Router(config)#
Router(config)#interface fa0/0.10
Router(config-subif)#encapsulation dot1Q 10
Router(config-subif)#ip address 192.168.10.1 255.255.255.224
Router(config-subif)#no shutdown
Router(config-subif)#exit
Router(config)#interface fa0/0.20
Router(config-subif)#encapsulation dot1Q 20
Router(config-subif)#ip address 192.168.10.33 255.255.255.224
Router(config-subif)#no shutdown
Router(config-subif)#exit
%LINK-5-CHANGED: Interface FastEthernet0/0.10, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.10, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.20, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.20, changed state to up

Router(config)#+
```

- **Konfigurasi IP pada PC:**

The image displays two windows of a network configuration tool, labeled PC0 and PC1, illustrating the setup of static IP addresses for two hosts.

PC0 Configuration (Top Window):

- IP Configuration:**
 - Interface: FastEthernet0
 - IP Configuration:
 - DHCP (unchecked)
 - Static (selected)
 - 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 (unchecked)
 - Static (selected)
 - IPv6 Address: FE80::2D0:97FF:FE16:1D
 - Link Local Address: FE80::2D0:97FF:FE16:1D
 - Default Gateway:
 - DNS Server:
- 802.1X:**
 - Use 802.1X Security (unchecked)
 - Authentication: MD5
 - Username:
 - Password:

PC1 Configuration (Bottom Window):

- IP Configuration:**
 - Interface: FastEthernet0
 - IP Configuration:
 - DHCP (unchecked)
 - Static (selected)
 - IPv4 Address: 192.168.10.20
 - Subnet Mask: 255.255.255.224
 - Default Gateway: 192.168.10.1
 - DNS Server: 0.0.0.0
- IPv6 Configuration:**
 - Automatic (unchecked)
 - Static (selected)
 - IPv6 Address: FE80::2D0:FFFF:FE23:20D7
 - Link Local Address: FE80::2D0:FFFF:FE23:20D7
 - Default Gateway:
 - DNS Server:
- 802.1X:**
 - Use 802.1X Security (unchecked)
 - Authentication: MD5
 - Username:
 - Password:

PC2

Physical Config Desktop Programming Attributes

IP Configuration

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::201:C7FF:FE00:376D

Default Gateway:

DNS Server:

802.1X

Use 802.1X Security

Authentication: MD5

Username:

Password:

PC3

Physical Config Desktop Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

DHCP Static

IPv4 Address: 192.168.10.44

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::260:47FF:FE75:A67

Default Gateway:

DNS Server:

802.1X

Use 802.1X Security

Authentication: MD5

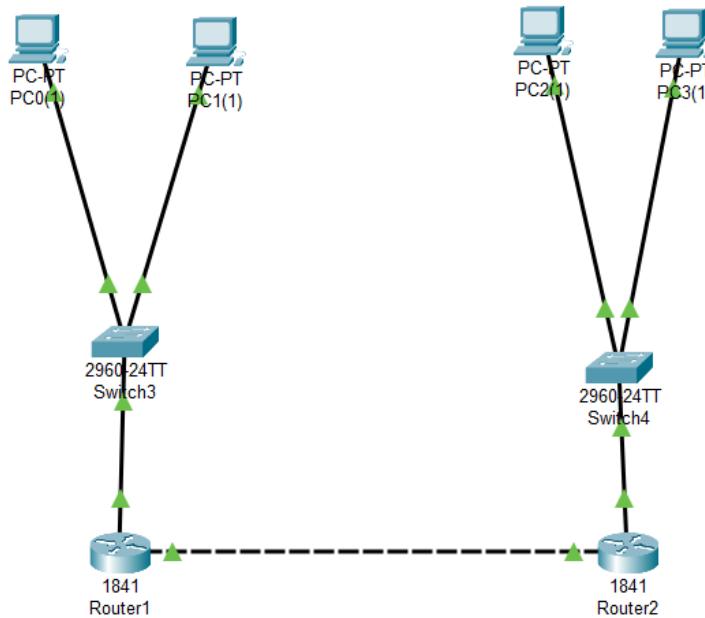
Username:

Password:

Scenario 2: 2 Router, masing-masing ke Subnet Berbeda

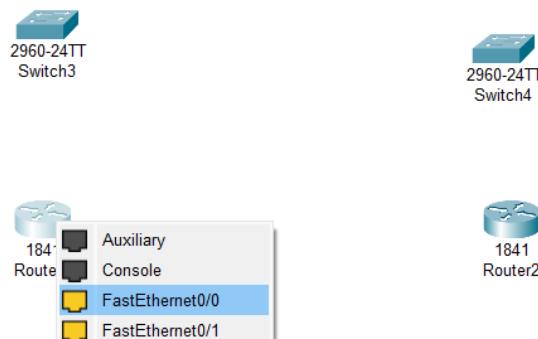
- **Komponen:**

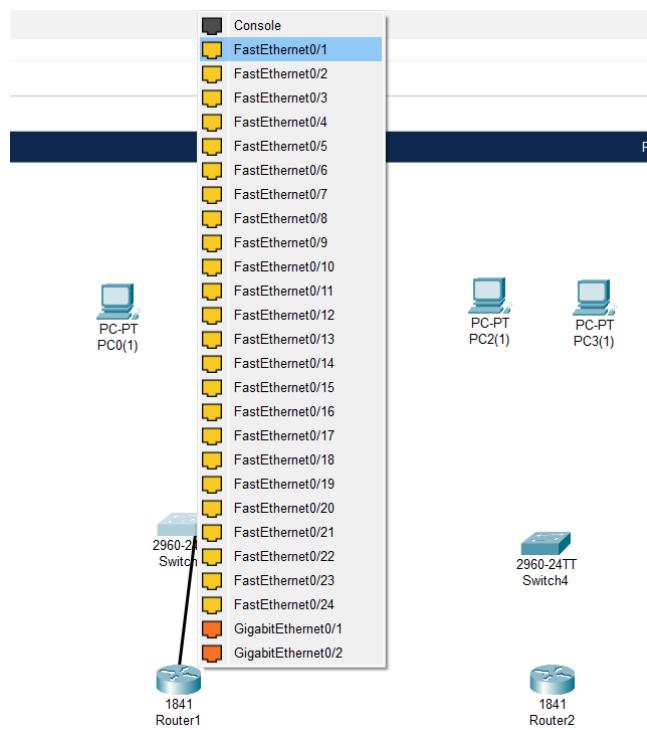
- 2 Router (Cisco Router 1841)
- 2 Switch (Cisco Catalyst 2960)
- 4 PC
- Straight-Through Cable: Router ke Switch, Switch ke PC.
- Serial Cable atau Cross-Over Cable: Router ke Router.



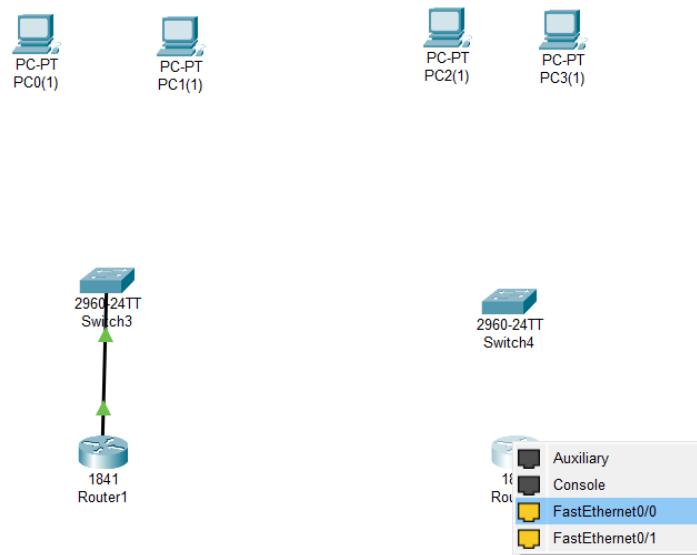
- **Koneksi Fisik:**

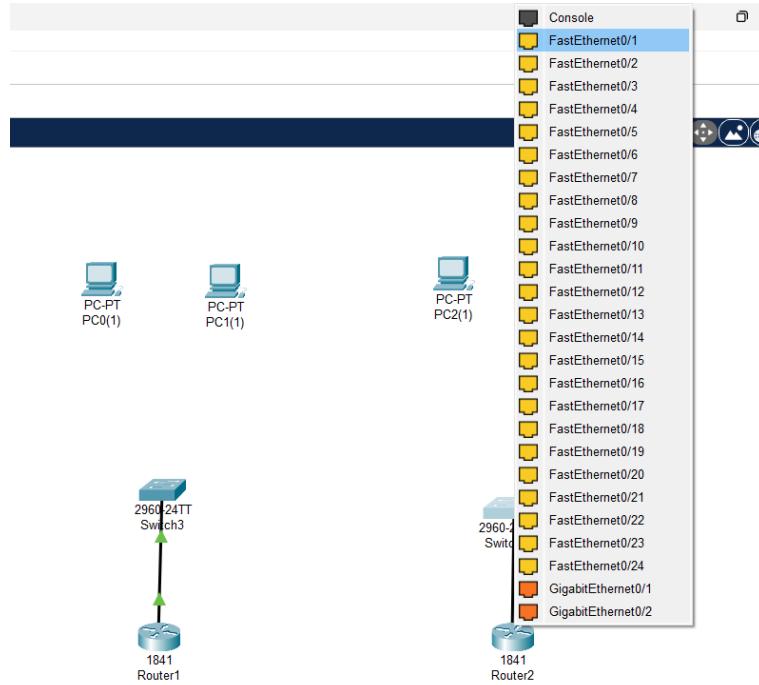
- Sambungkan:
 - Router 1 (FastEthernet0/0) ke Switch 1 (FastEthernet0/1).



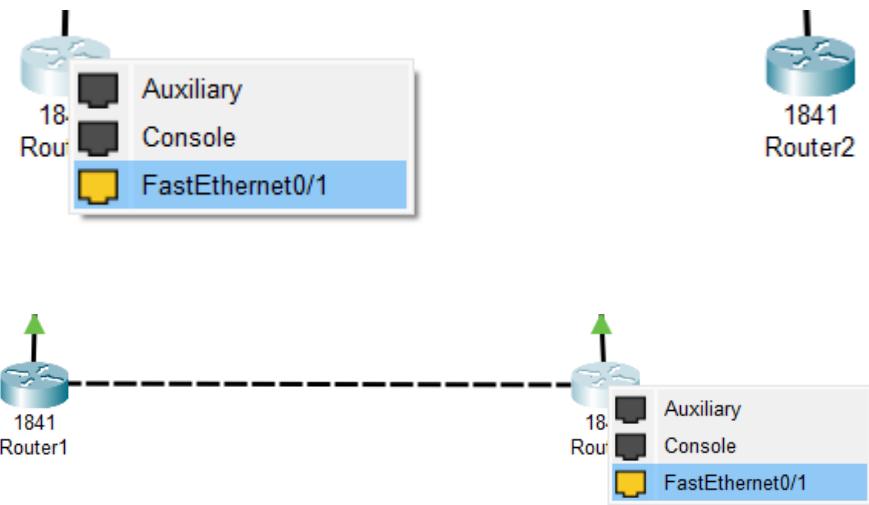


- Router 2 (FastEthernet0/0) ke Switch 2 (FastEthernet0/1).

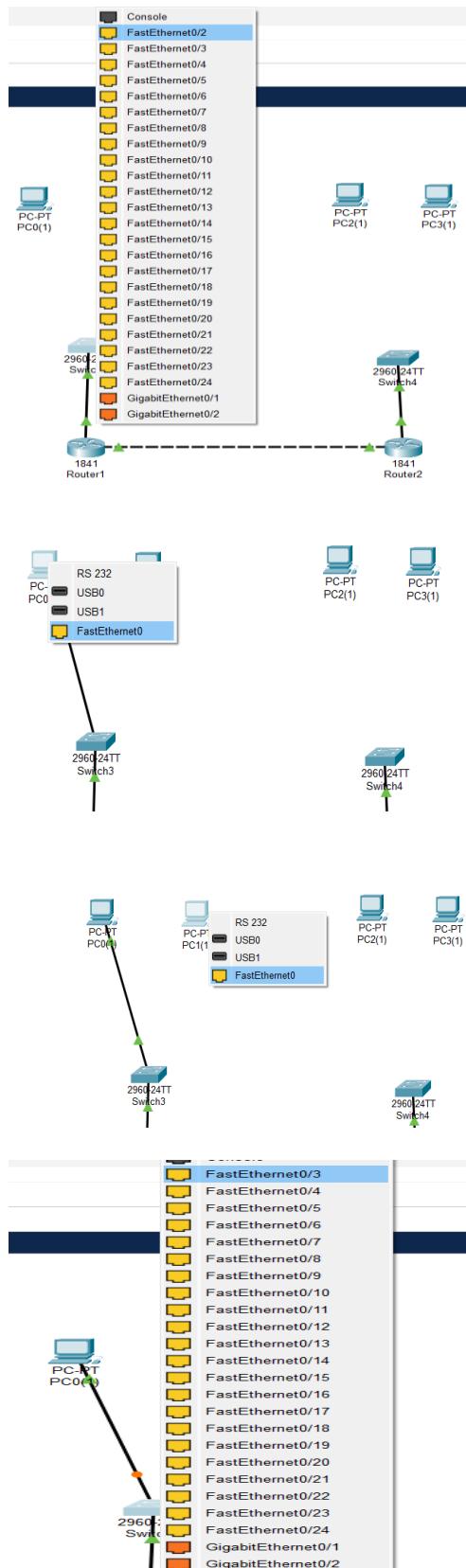




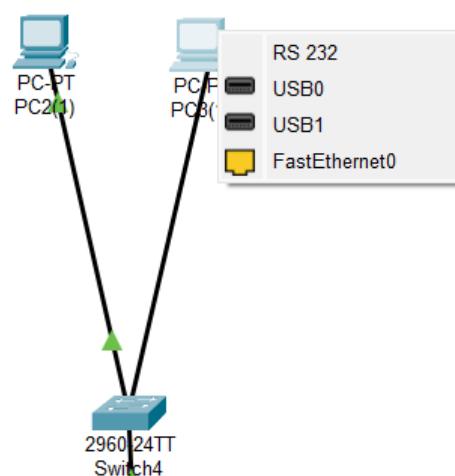
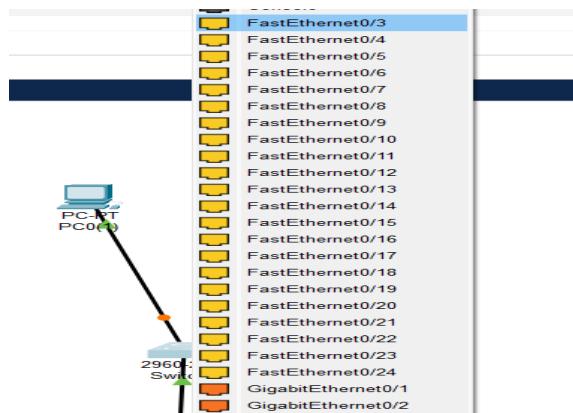
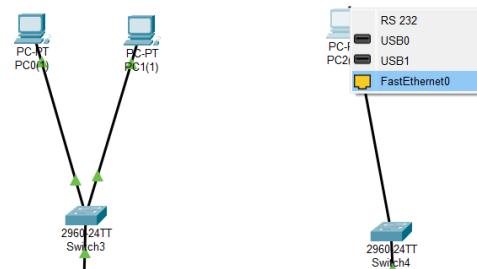
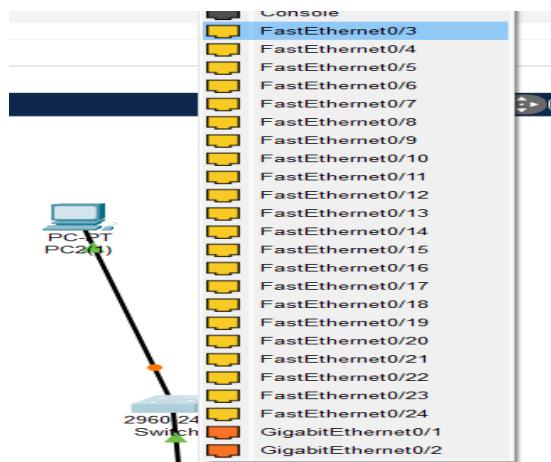
- Router 1 dan Router 2 menggunakan serial link atau cross-over cable.



- PC0 dan PC1 ke Switch 1.



- PC2 dan PC3 ke Switch 2.



- Konfigurasi Router:

Router 1:

The screenshot shows the configuration interface for Router 1. It has two main panels: one for **FastEthernet0/0** and one for **FastEthernet0/1**. Both panels include fields for Port Status, Bandwidth, Duplex, MAC Address, IP Configuration (IPv4 Address and Subnet Mask), and Tx Ring Limit. The configuration for both interfaces is identical.

FastEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="checkbox"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	000A.41D3.5401
IP Configuration	
IPv4 Address	192.168.10.1
Subnet Mask	255.255.255.224
Tx Ring Limit	10

FastEthernet0/1	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="checkbox"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	000A.41D3.5402
IP Configuration	
IPv4 Address	10.10.10.1
Subnet Mask	255.255.255.252
Tx Ring Limit	10

Router 2:

The screenshot shows the configuration interface for Router 2. It has two main panels: one for **FastEthernet0/0** and one for **FastEthernet0/1**. Both panels include fields for Port Status, Bandwidth, Duplex, MAC Address, IP Configuration (IPv4 Address and Subnet Mask), and Tx Ring Limit. The configuration for both interfaces is identical.

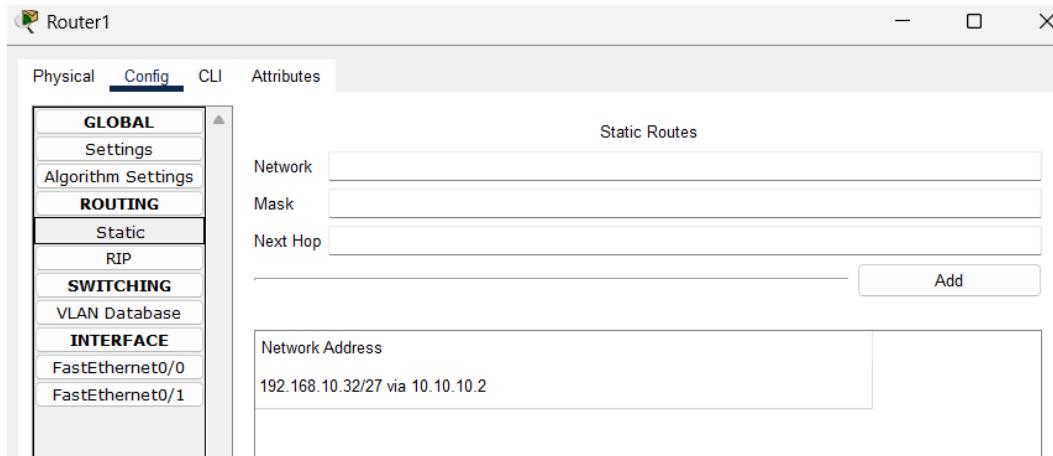
FastEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="checkbox"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0001.42E0.3B01
IP Configuration	
IPv4 Address	192.168.10.33
Subnet Mask	255.255.255.224
Tx Ring Limit	10

FastEthernet0/1	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="checkbox"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0001.42E0.3B02
IP Configuration	
IPv4 Address	10.10.10.2
Subnet Mask	255.255.255.252
Tx Ring Limit	10

- **Routing Antar Router:**

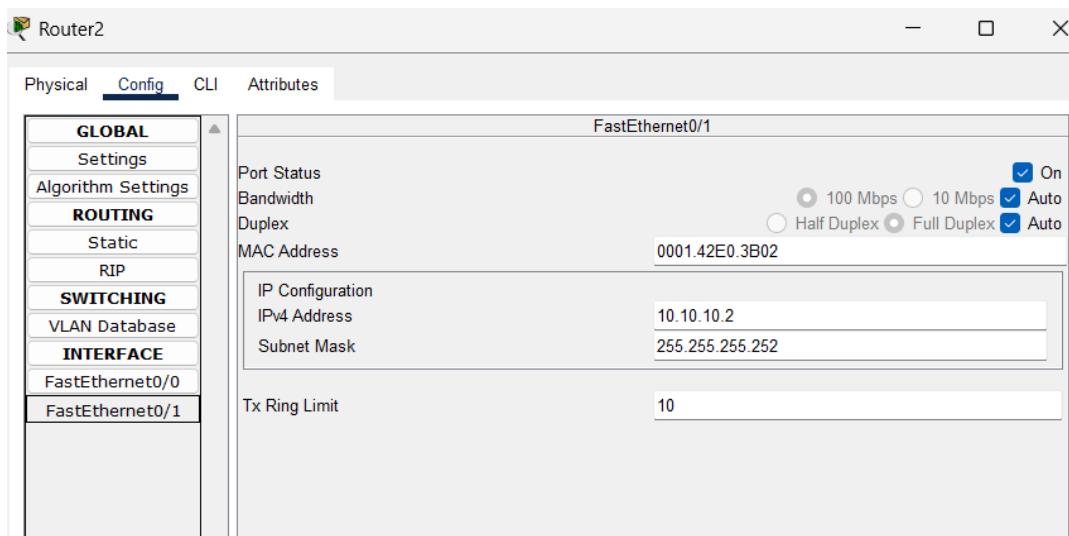
Router 1:

```
ip route 192.168.10.32 255.255.255.224 10.10.10.2
```



Router 2:

```
ip route 192.168.10.0 255.255.255.224 10.10.10.1
```



d. Uji Konektivitas (Ping)

➤ Scenario 1: 1 Router, 2 VLAN/Subnet di Switch

- **Ping Gateway:**

Dari PC0 (192.168.10.10) ping 192.168.10.1.

```
Cisco Packet Tracer PC Command Line 1.0
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=5ms 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 = 5ms, Average = 1ms

C:>
```

Dari PC2 (192.168.10.34) ping 192.168.10.33.

```
Cisco Packet Tracer PC Command Line 1.0
C:>ping 192.168.10.33

Pinging 192.168.10.33 with 32 bytes of data:

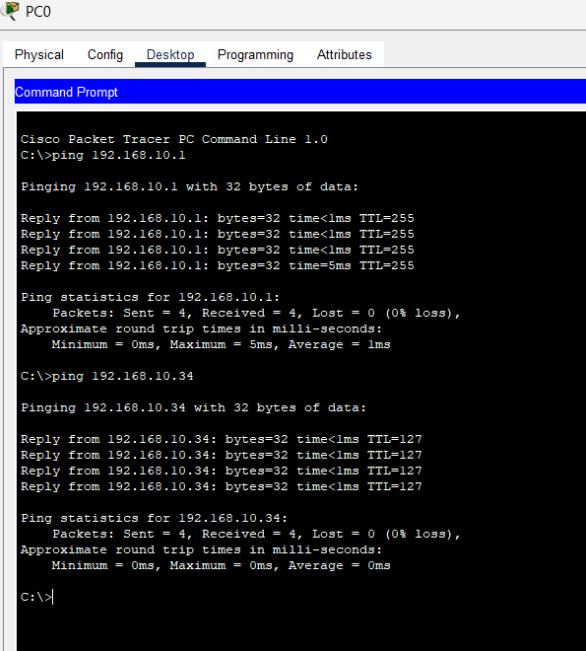
Reply from 192.168.10.33: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.10.33:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:>
```

- **Ping Lintas VLAN:**

Dari PC0 (VLAN 10) ping PC2 (VLAN 20). Jika berhasil, akan ada Reply from 192.168.10.34.



```
Cisco Packet Tracer PC Command Line 1.0
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=5ms 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 = 5ms, Average = 1ms

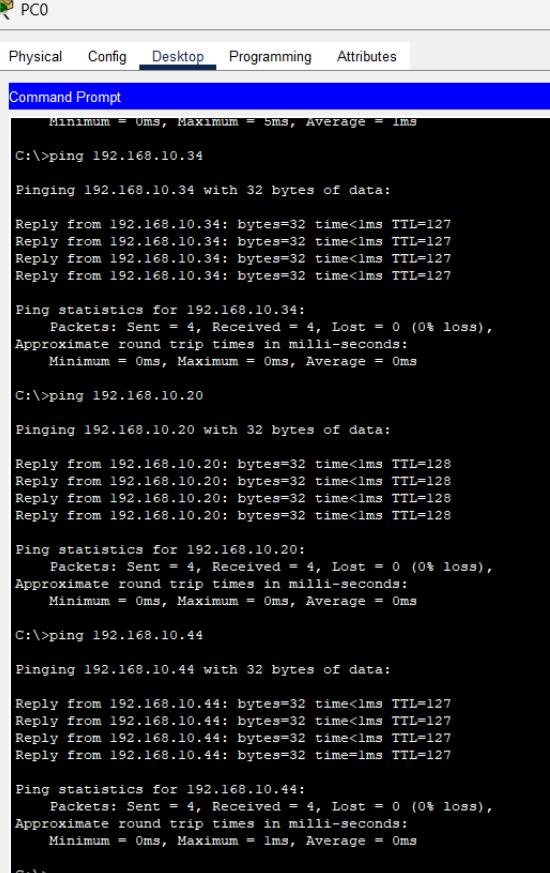
C:\>ping 192.168.10.34

Pinging 192.168.10.34 with 32 bytes of data:
Reply from 192.168.10.34: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.34:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Ulangi untuk semua PC yang terhubung ke VLAN berbeda.



```
Minimum = 0ms, Maximum = 5ms, Average = 1ms
C:\>ping 192.168.10.34

Pinging 192.168.10.34 with 32 bytes of data:
Reply from 192.168.10.34: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.34:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.20

Pinging 192.168.10.20 with 32 bytes of data:
Reply from 192.168.10.20: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.44

Pinging 192.168.10.44 with 32 bytes of data:
Reply from 192.168.10.44: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.44:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

- **Troubleshooting:**

Jika ada permasalahan pada Request timed out, cek IP, subnet mask, gateway, trunk port, dan sub-interface VLAN di router.

Gunakan **show vlan brief** di switch untuk memastikan VLAN.

```
Switch>show vlan brief

VLAN Name          Status      Ports
----  -----
1    default        active     Fa0/6, Fa0/7, Fa0/8, Fa0/9
                           Fa0/10, Fa0/11, Fa0/12, Fa0/13
                           Fa0/14, Fa0/15, Fa0/16, Fa0/17
                           Fa0/18, Fa0/19, Fa0/20, Fa0/21
                           Fa0/22, Fa0/23, Fa0/24, Gig0/1
                           Gig0/2
10   VLAN_10       active     Fa0/2, Fa0/3
20   VLAN_20       active     Fa0/4, Fa0/5
1002 fddi-default  active
1003 token-ring-default  active
1004 fddinet-default  active
1005 trnet-default   active
Switch>
```

Gunakan **show ip interface brief** di router untuk melihat status interface.

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.20, changed state to up
```

```
Router>show ip interface brief
Interface          IP-Address      OK? Method Status      Protocol
FastEthernet0/0     unassigned     YES unset  up
FastEthernet0/0.10  192.168.10.1  YES manual up
FastEthernet0/0.20  192.168.10.33 YES manual up
FastEthernet0/1     unassigned     YES unset  administratively down down
Vlan1              unassigned     YES unset  administratively down down
Router>
```

➤ **Scenario 2: 2 Router, masing-masing ke Subnet Berbeda**

- **Ping Gateway:**

Dari PC0 (192.168.10.10) ping 192.168.10.1.

```
Cisco Packet Tracer PC Command Line 1.0
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 = 1ms, Average = 0ms

C:\>
```

Dari PC2 (192.168.10.34) ping 192.168.10.33.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.33

Pinging 192.168.10.33 with 32 bytes of data:

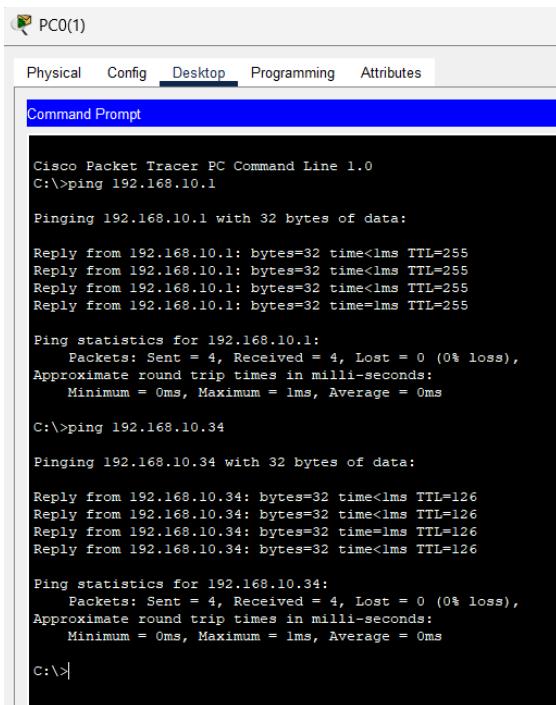
Reply from 192.168.10.33: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.10.33:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

- **Ping Lintas VLAN:**

Dari PC0 (VLAN 10) ping PC2 (VLAN 20). Jika berhasil, akan ada Reply from 192.168.10.34.



The screenshot shows the Cisco Packet Tracer Command Line interface. The title bar says "PC0(1)". The menu bar includes "Physical", "Config", "Desktop" (which is selected), "Programming", and "Attributes". The main window is titled "Command Prompt". The command entered is "C:\>ping 192.168.10.34". The output shows the ping results for both 192.168.10.1 and 192.168.10.34, indicating successful replies with 0% loss and low latency.

```
Cisco Packet Tracer PC Command Line 1.0
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 = 1ms, Average = 0ms

C:\>ping 192.168.10.34

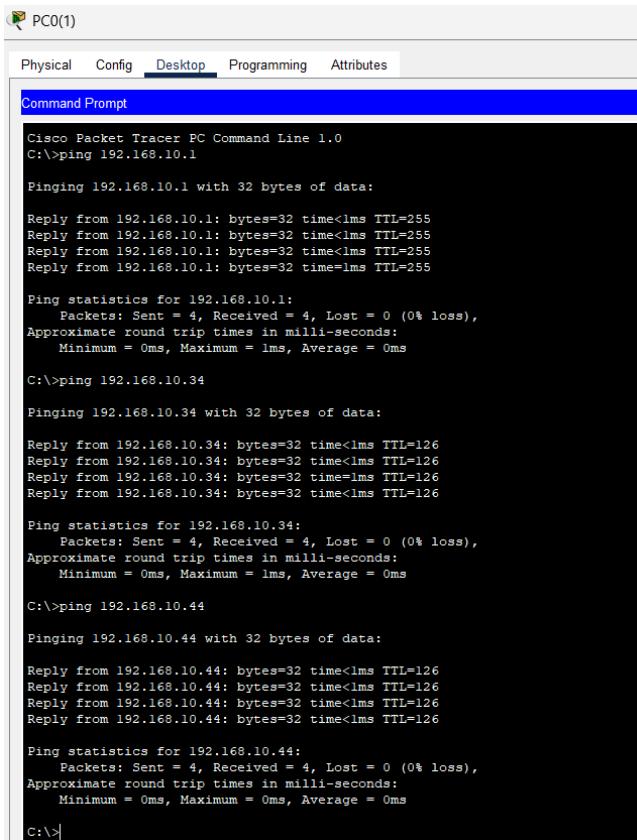
Pinging 192.168.10.34 with 32 bytes of data:

Reply from 192.168.10.34: bytes=32 time<1ms TTL=126
Reply from 192.168.10.34: bytes=32 time<1ms TTL=126
Reply from 192.168.10.34: bytes=32 time=<1ms TTL=126
Reply from 192.168.10.34: bytes=32 time=<1ms TTL=126

Ping statistics for 192.168.10.34:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

Ulangi untuk semua PC yang terhubung ke VLAN berbeda.



The screenshot shows the Cisco Packet Tracer Command Line interface. The title bar says "PC0(1)". The menu bar includes "Physical", "Config", "Desktop" (selected), "Programming", and "Attributes". The main window is titled "Command Prompt". The command entered is "C:\>ping 192.168.10.44". The output shows the ping results for both 192.168.10.1 and 192.168.10.44, indicating successful replies with 0% loss and low latency.

```
Cisco Packet Tracer PC Command Line 1.0
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 = 1ms, Average = 0ms

C:\>ping 192.168.10.34

Pinging 192.168.10.34 with 32 bytes of data:

Reply from 192.168.10.34: bytes=32 time<1ms TTL=126
Reply from 192.168.10.34: bytes=32 time<1ms TTL=126
Reply from 192.168.10.34: bytes=32 time=<1ms TTL=126
Reply from 192.168.10.34: bytes=32 time=<1ms TTL=126

Ping statistics for 192.168.10.34:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.10.44

Pinging 192.168.10.44 with 32 bytes of data:

Reply from 192.168.10.44: bytes=32 time<1ms TTL=126
Reply from 192.168.10.44: bytes=32 time<1ms TTL=126
Reply from 192.168.10.44: bytes=32 time=<1ms TTL=126
Reply from 192.168.10.44: bytes=32 time=<1ms TTL=126

Ping statistics for 192.168.10.44:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

```

PC3(1)
Physical Config Desktop Programming Attributes

Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:>ping 192.168.10.20

Pinging 192.168.10.20 with 32 bytes of data:

Reply from 192.168.10.20: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.10.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:>ping 192.168.10.10

Pinging 192.168.10.10 with 32 bytes of data:

Reply from 192.168.10.10: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:>ping 192.168.10.34

Pinging 192.168.10.34 with 32 bytes of data:

Reply from 192.168.10.34: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.34:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:>

```

- Troubleshooting:**

Jika ada permasalahan pada Request timed out, cek IP, subnet mask, gateway, trunk port, dan sub-interface VLAN di router.

Gunakan **show vlan brief** di switch untuk memastikan VLAN.

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	
Switch>		

Gunakan **show ip interface brief** di router untuk melihat status interface.

```
Router>show ip interface brief
Interface          IP-Address      OK? Method Status      Protocol
FastEthernet0/0    192.168.10.1   YES manual up        up
FastEthernet0/1    10.10.10.1    YES manual up        up
Vlan1             unassigned     YES unset administratively down down
Router>
```

```
Router>show ip interface brief
Interface          IP-Address      OK? Method Status      Protocol
FastEthernet0/0    192.168.10.33  YES manual up        up
FastEthernet0/1    10.10.10.2   YES manual up        up
Vlan1             unassigned     YES unset administratively down down
Router>|
```

Ringkasan Diskusi:

1. FLSM (Fixed Length Subnet Mask)

- **Definisi:**

- FLSM adalah metode pembagian subnet di mana semua subnet memiliki ukuran yang sama (subnet mask yang tetap).
- Contoh: Dalam praktikum ini, semua subnet menggunakan subnet mask /27 (255.255.255.224), yang memungkinkan setiap subnet menampung 30 host.

- **Keuntungan:**

- Mudah dikonfigurasi dan dikelola karena semua subnet memiliki ukuran yang sama.
- Cocok untuk jaringan dengan kebutuhan host yang seragam.

- **Kekurangan:**

- Tidak fleksibel. Jika ada subnet yang membutuhkan lebih banyak host, akan ada pemborosan alamat IP.
- Contoh: Jika sebuah subnet hanya membutuhkan 10 host, tetapi menggunakan /27, maka 20 alamat IP akan terbuang.

- **Contoh dalam Praktikum:**

- VLAN 10: 192.168.10.0/27 (30 host)
- VLAN 20: 192.168.10.32/27 (30 host)

2. CIDR (Classless Inter-Domain Routing)

- **Definisi:**

- CIDR adalah metode pembagian subnet yang lebih fleksibel, di mana subnet mask dapat bervariasi sesuai kebutuhan.
- Subnet mask tidak terpaku pada kelas IP (Class A, B, C), sehingga memungkinkan pengalokasian IP yang lebih efisien.

- **Keuntungan:**

- Fleksibel. Subnet mask dapat disesuaikan dengan jumlah host yang dibutuhkan.
- Mengurangi pemborosan alamat IP.
- Cocok untuk jaringan dengan kebutuhan host yang bervariasi.

- **Kekurangan:**

- Lebih kompleks dalam perhitungan dan konfigurasi.
- Membutuhkan perencanaan yang lebih matang.

- **Contoh:**

- Jika ada subnet yang membutuhkan 10 host, bisa menggunakan subnet mask /28 (255.255.255.240), yang menyediakan 14 host.
- Jika ada subnet yang membutuhkan 50 host, bisa menggunakan subnet mask /26 (255.255.255.192), yang menyediakan 62 host.

3. Struktur Jaringan Scenario 2

- Router 1 terhubung ke Switch 1, yang menangani Subnet 192.168.10.0/27 (VLAN 10 di Scenario 1).
- Router 2 terhubung ke Switch 2, yang menangani Subnet 192.168.10.32/27 (VLAN 20 di Scenario 1).
- Kedua router terhubung langsung menggunakan serial atau cross-over cable dengan jaringan 10.10.10.0/30 untuk komunikasi antar subnet.

4. Perbedaan dengan Scenario 1

- Scenario 1 menggunakan satu switch dan dua VLAN (VLAN 10 & VLAN 20) di dalamnya, sehingga perlu VLAN dan trunking.

- Scenario 2 menggunakan dua switch, masing-masing hanya menangani satu subnet langsung ke router, sehingga tidak perlu VLAN karena pemisahan sudah dilakukan secara fisik.

5. Kesimpulan

 Pada **Scenario 2 tidak menggunakan VLAN di kedua switch**, karena masing-masing switch hanya menangani satu subnet tanpa berbagi jaringan dengan subnet lain.

GITHUB :

<https://github.com/DeathMoonerg/DMJK-TUGAS-3-RAYHAN-IQBAL->