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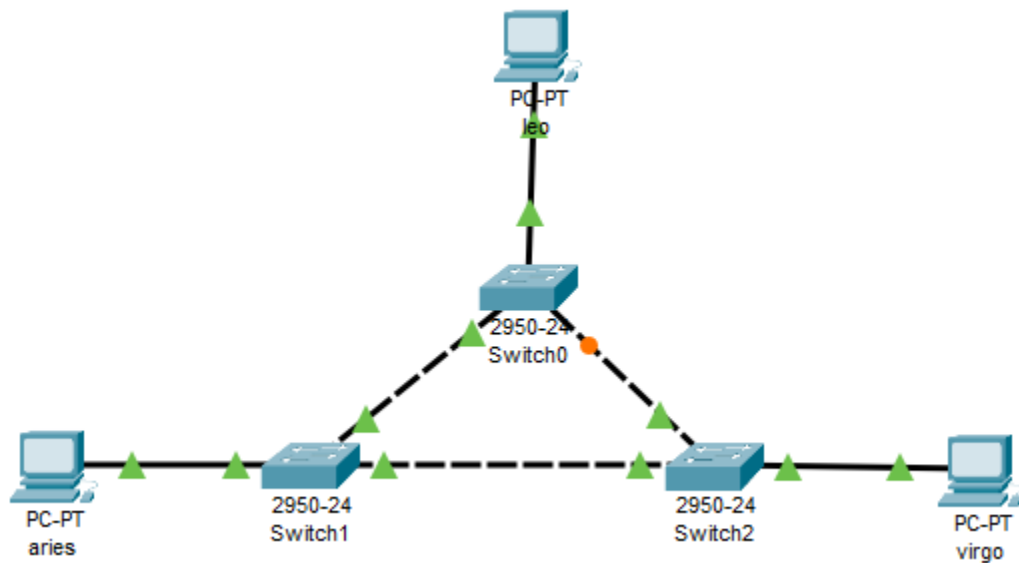
Matkul: Praktikum Jaringan Komputer

MODUL 6

SPANNING TREE PROTOCOL

1. Kegiatan 1. Topologi 1

a. Membuat topologi

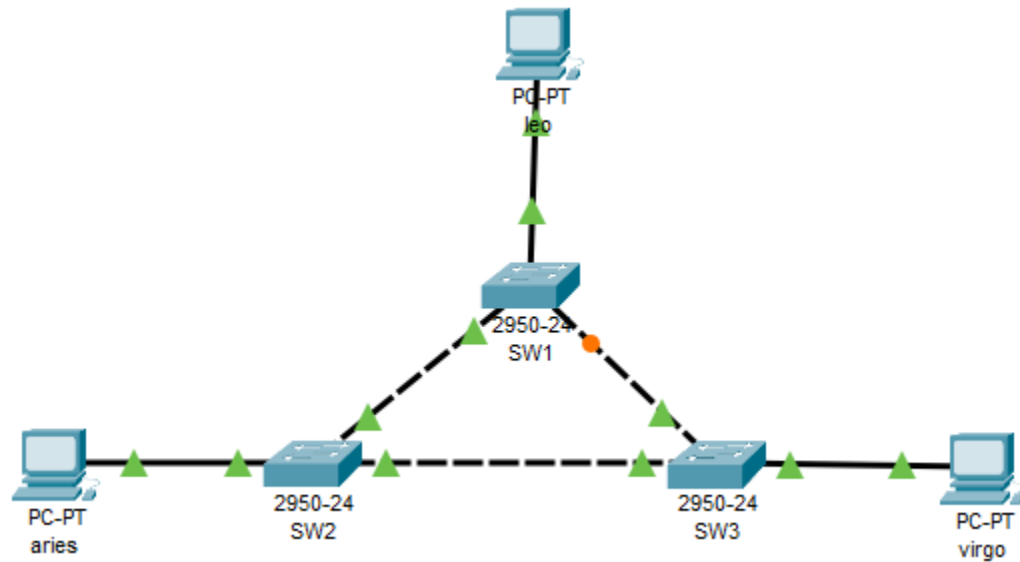


Tugas 1A : Tulis langkah pembuatan topologi.

Jawab :

Pembuatan topologi pada kegiatan 1 menggunakan tiga buah switch 2950-24 yang dirangkai menjadi bentuk segitiga yang saling terhubung. Pada setiap switch juga dihubungkan dengan PC. Switch 0 (SW 1) dihubungkan dengan PC Leo, switch 1 (SW 2) dihubungkan dengan PC Aries, dan switch 3 (SW 3) dihubungkan dengan PC Virgo.

- b. Memberi nama masing-masing switch dengan SW1, SW2, dan SW3



Tugas 2A : Tulis langkah pemberian nama switch mulai dari mode user.

Jawab :

Switch paling atas diberi nama SW1, switch sebelah kiri diberi nama SW2 dan switch disebelah kanan diberi nama SW3.

- c. Konfigurasi masing-masing PC dengan alamat IP.

Leo = 172.21.1.1/24

The screenshot shows a network configuration window titled "leo" with tabs for Physical, Config, Desktop, Programming, and Attributes. The "Desktop" tab is active, displaying the "IP Configuration" window for the "FastEthernet0" interface. The "IP Configuration" section has two radio buttons: "DHCP" (unselected) and "Static" (selected). Below these are input fields for "IP Address" (172.21.1.1), "Subnet Mask" (255.255.255.0), "Default Gateway" (0.0.0.0), and "DNS Server" (0.0.0.0). The "IPv6 Configuration" section has three radio buttons: "DHCP" (unselected), "Auto Config" (unselected), and "Static" (selected). Below these are input fields for "IPv6 Address" (empty), "Link Local Address" (FE80::240:BFF:FED1:8B2B), "IPv6 Gateway" (empty), and "IPv6 DNS Server" (empty). At the bottom, there is a section for "802.1X" with a checkbox for "Use 802.1X Security" (unchecked). A "Top" button is located at the bottom left of the window.

leo

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address 172.21.1.1

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::240:BFF:FED1:8B2B

IPv6 Gateway

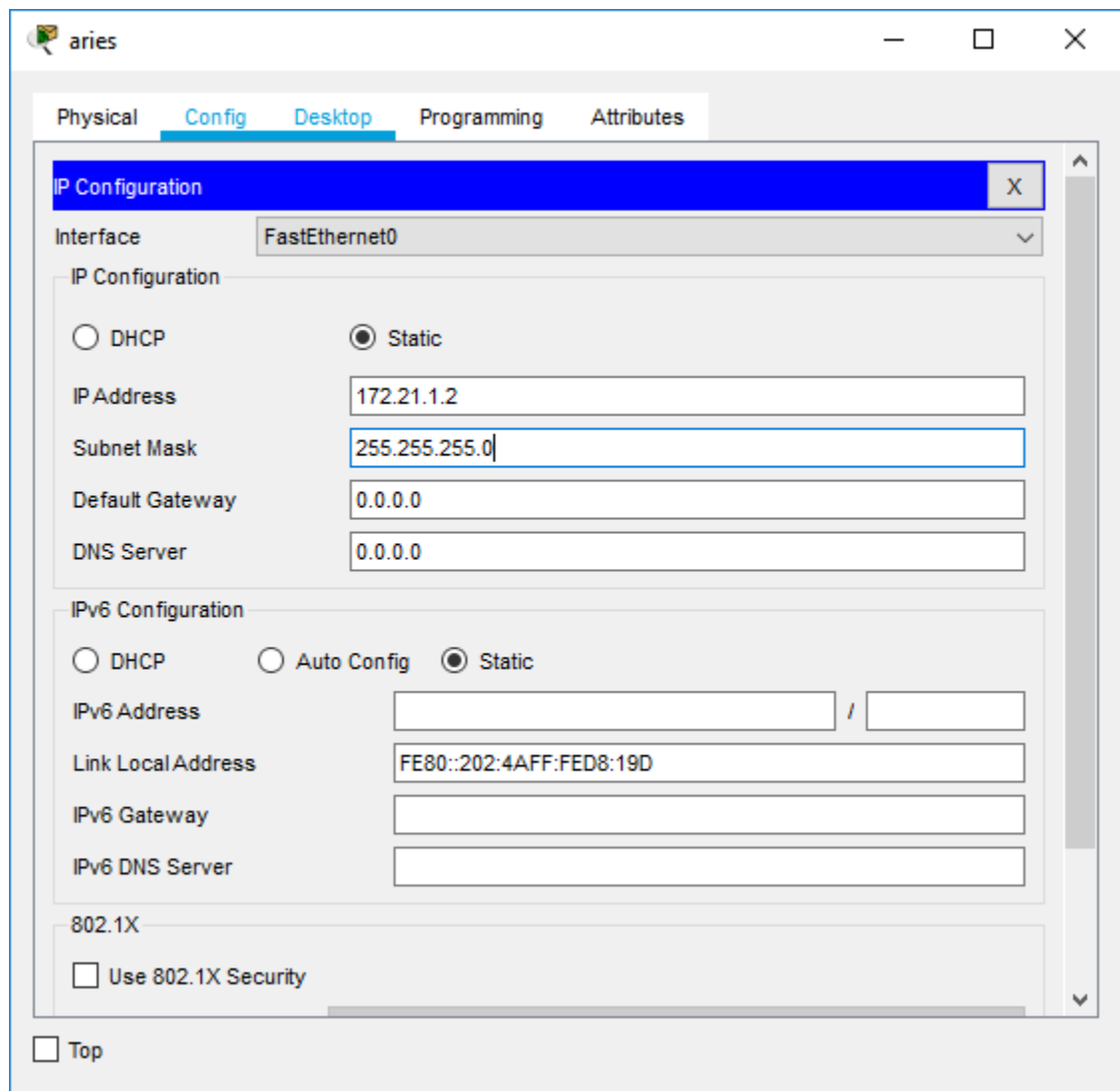
IPv6 DNS Server

802.1X

☐ Use 802.1X Security

☐ Top

Aries = 172.21.1.2/24



The screenshot shows a window titled "aries" with a tabbed interface. The "Config" tab is selected, and the "IP Configuration" section is active. The interface is divided into several sections: "Interface" (FastEthernet0), "IP Configuration", "IPv6 Configuration", and "802.1X".

Interface: FastEthernet0

IP Configuration:

- ☐ DHCP
- ☒ Static
- IP Address: 172.21.1.2
- Subnet Mask: 255.255.255.0
- Default Gateway: 0.0.0.0
- DNS Server: 0.0.0.0

IPv6 Configuration:

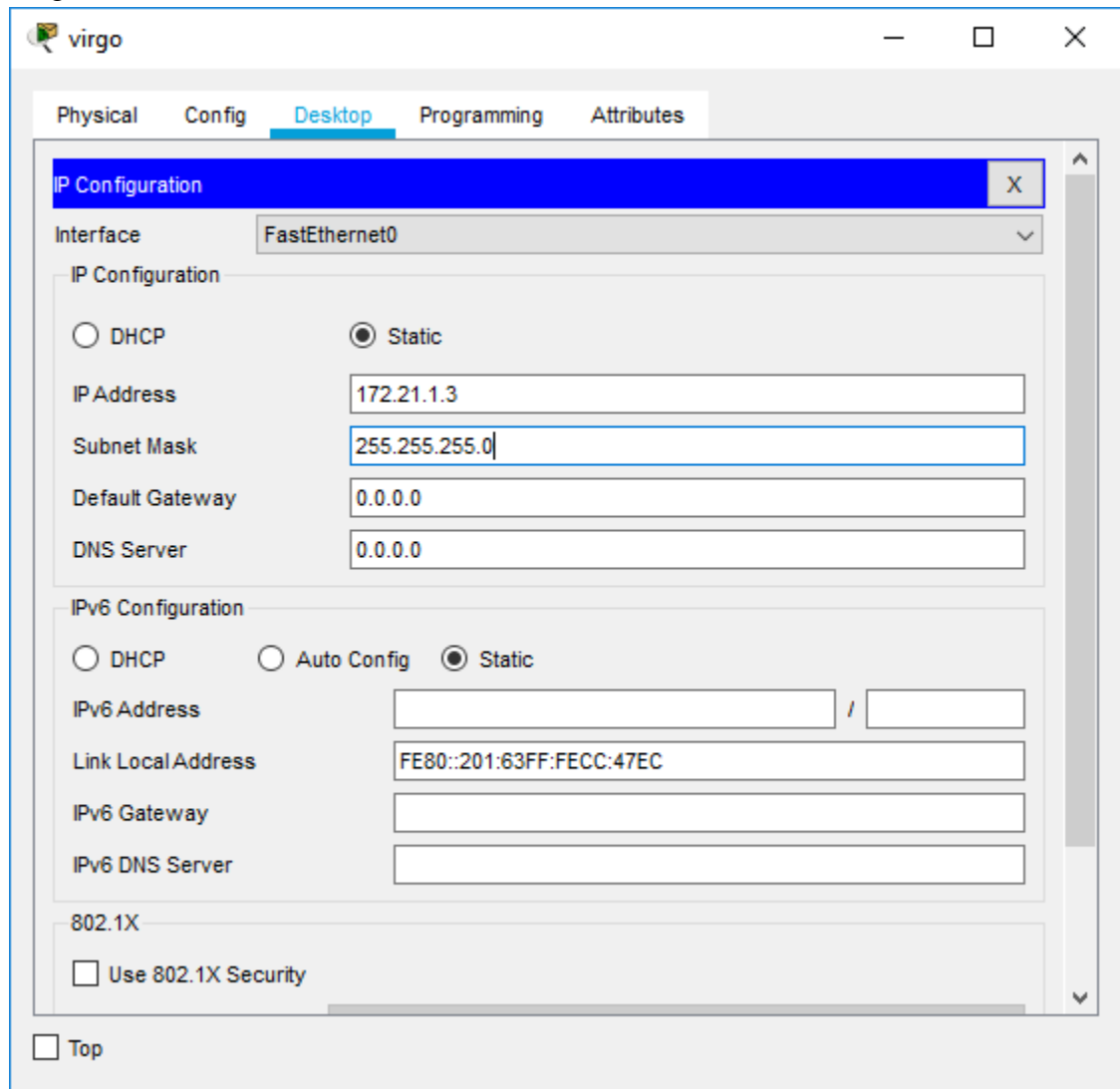
- ☐ DHCP
- ☐ Auto Config
- ☒ Static
- IPv6 Address: [empty] / [empty]
- Link Local Address: FE80::202:4AFF:FED8:19D
- IPv6 Gateway: [empty]
- IPv6 DNS Server: [empty]

802.1X:

- ☐ Use 802.1X Security

☐ Top

Virgo = 172.21.1.3/24



- d. Pada mode user atau mode privileged, lihat status STP pada masing- masing switch.

Langkah pengoperasian

- Tekan enter
- Masuk mode privileged
- Ketik show spanning-tree

Tugas 4A : Pada kondisi default, capture masing-masing tampilan status STP switch (SW1, SW2, SW3).

SW1

SW1

Physical

Config

CLI

Attributes

IOS Command Line Interface

Switch>enable
Switch#show spanning-tree
VLAN0001
Spanning tree enabled protocol ieee
Root ID Priority 32769
 Address 0006.2ADB.0696
 Cost 19
 Port 1(FastEthernet0/1)
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
 Address 0010.110E.AA48
 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Aging Time 20

Interface Role Sts Cost Prio.Nbr Type

Fa0/1 Root FWD 19 128.1 P2p
Fa0/2 Altn BLK 19 128.2 P2p
Fa0/3 Desg FWD 19 128.3 P2p

Switch#

Ctrl+F6 to exit CLI focus

Copy

Paste

☐ Top

Sw2

SW2

PhysicalConfigCLIAttributes

IOS Command Line Interface

changed state to up

Switch>enable

Switch#show spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

Root ID Priority 32769

Address 0006.2ADB.0696

This bridge is the root

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)

Address 0006.2ADB.0696

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Aging Time 20

Interface	Role	Sts	Cost	Prio.Nbr	Type
Fa0/2	Desg	FWD	19	128.2	P2p
Fa0/3	Desg	FWD	19	128.3	P2p
Fa0/1	Desg	FWD	19	128.1	P2p

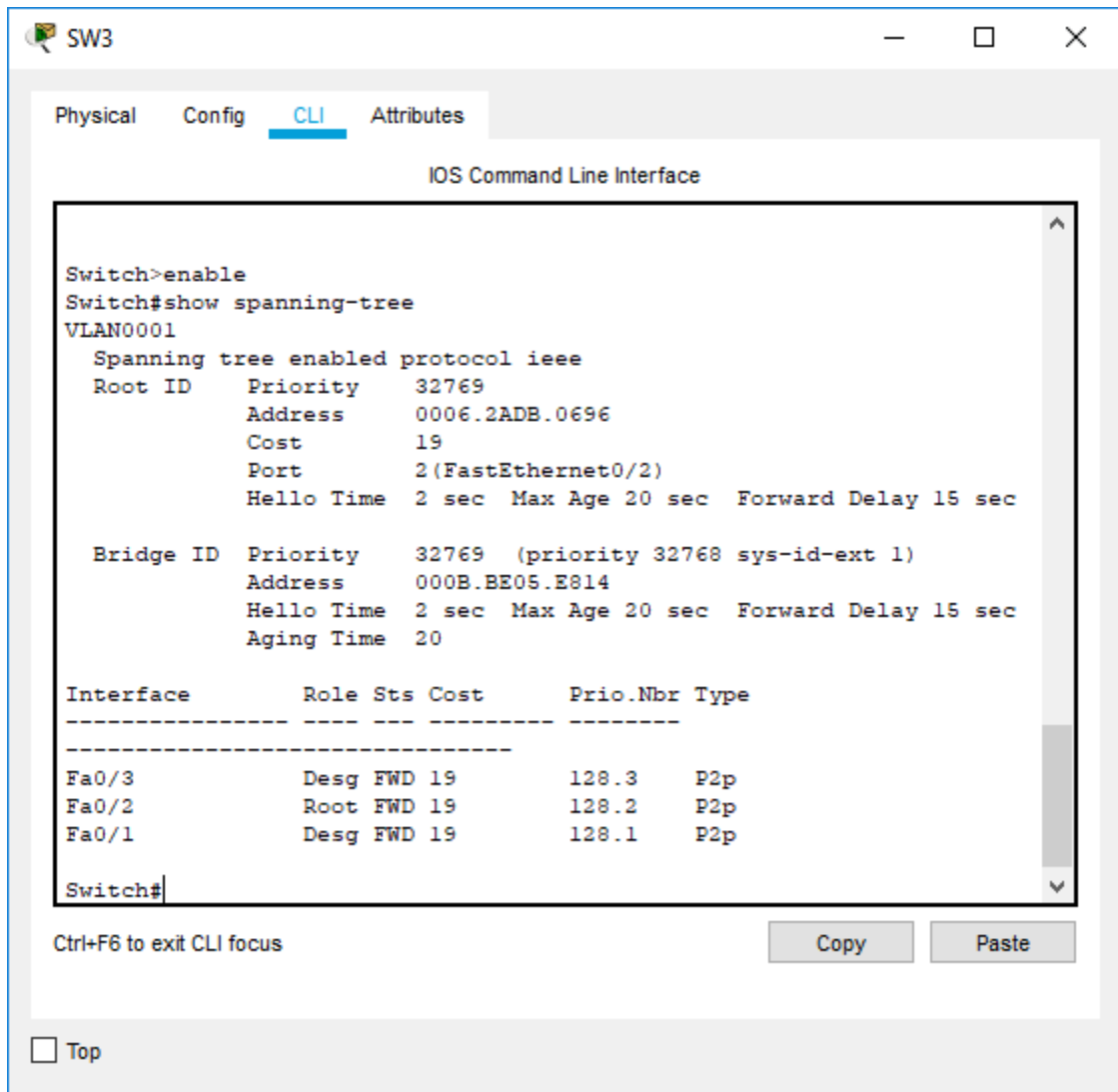
Switch#

Ctrl+F6 to exit CLI focus

CopyPaste

☐ Top

Sw3



Tugas 4B : Untuk tiap-tiap switch, isikan tabel berikut:

SW1

NO	Variable	Nilai
1	Root ID	32769, 0006.2ADB.0696
2	Priority	32769
3	MAC Address	0006.2ADB.0696
4	Bridge ID	0010.110E.AA48
5	Cost (0/1;0/2;0/3)	Fa0/1: Root;FWD; 19; 128.1; P2p Fa0/2: Altn; BLK; 19; 128.2; P2p Fa0/3: Desg; FWD; 19; 128.3; P2p
6	Hello time	2 sec
7	MaxAge	20 sec

8	Forward Delay	15 sec
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SW2

NO	Variable	Nilai
1	Root ID	32769, 0006.2ADB.0696
2	Priority	32769
3	MAC Address	0006.2ADB.0696
4	Bridge ID	0010.110E.AA48
5	Cost (0/1;0/2;0/3)	Fa0/2: Desg; FWD; 19; 128.2; P2p Fa0/3: Desg; FWD; 19; 128.3; P2p Fa0/1: Desg; FWD; 19; 128.1; P2p
6	Hello time	2 sec
7	MaxAge	20 sec
8	Forward Delay	15 sec

SW3

NO	Variable	Nilai
1	Root ID	32769, 0006.2ADB.0696
2	Priority	32769
3	MAC Address	0006.2ADB.0696
4	Bridge ID	000B.BE05.E814
5	Cost (0/1;0/2;0/3)	Fa0/3: Desg; FWD; 19; 128.3; P2p Fa0/2: Root; FWD; 19; 128.2; P2p Fa0/1: Desg; FWD; 19; 128.1; P2p
6	Hello time	2 sec
7	MaxAge	20 sec
8	Forward Delay	15 sec

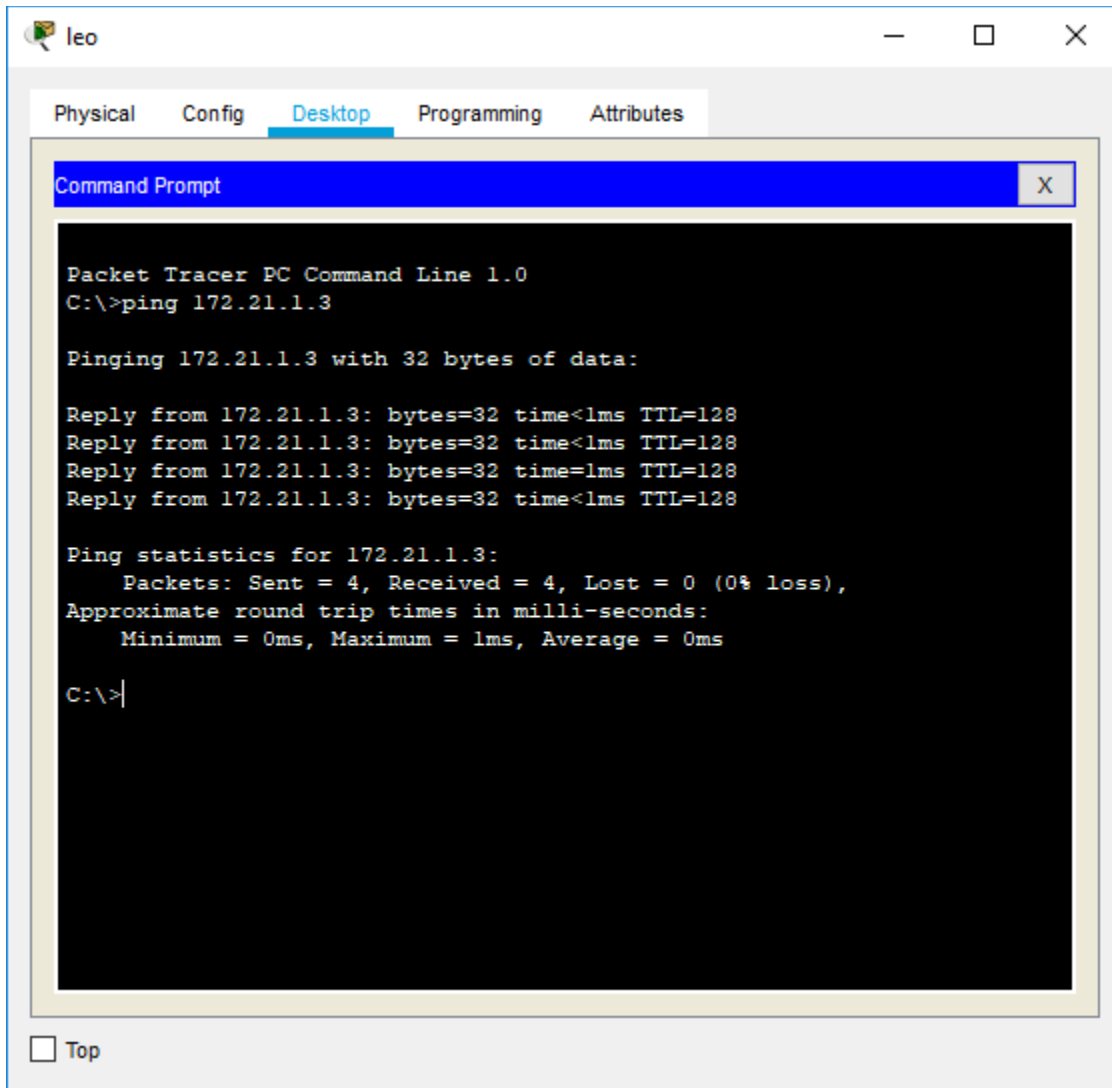
Tugas 4C : Pada kondisi default tersebut, switch dan port mana saja yang:

- Menjadi root bridge: SW2
- Menjadi designated bridge: SW2
- Menjadi root port: SW1(Fa0/2), SW3(Fa0/1)
- Menjadi designated port: SW2

Tugas 4D : Pada kondisi default tersebut, dan port mana saja yang:

- Berada pada keadaan forwarding: SW2, SW3
- Berada pada keadaan blocking: SW1(Fa0/1)

e. Dari PC Leo lakukan ping ke PC Virgo



Tugas 5A: Tulis langkah untuk melakukan perintah ping.

Jawab :

Klik PC Leo pilih menu “Desktop” lalu pilih “Command prompt” lalu ketikkan “ping 172.21.1.3” kemudian tekan enter.

f. Simpan konfigurasi jaringan dengan nama lab2.nwc

Tugas 6A: Tulislah langkah untuk menyimpan konfigurasi jaringan.

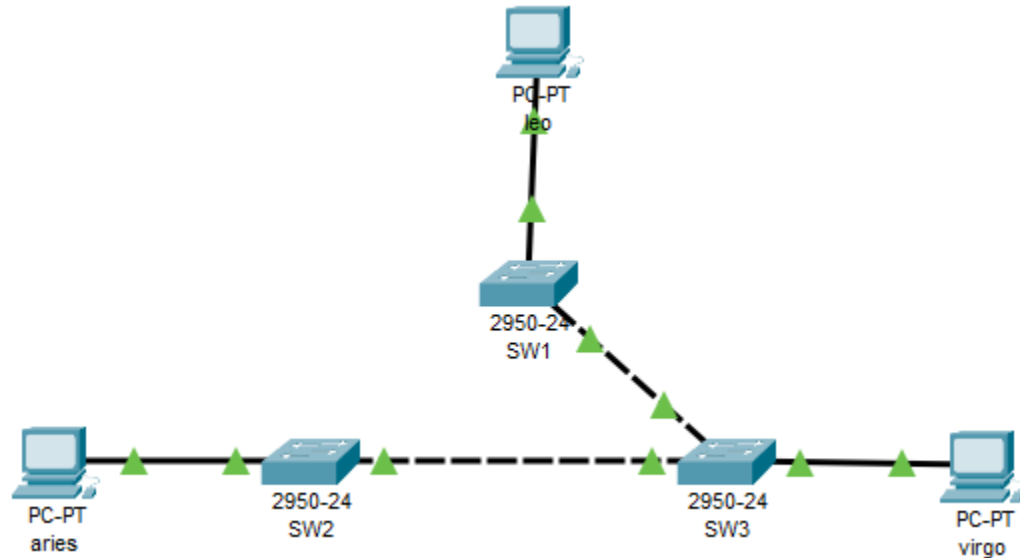
Jawab :

- Klik “File”
- pilih “Save as”
- pilih direktori

- ketikkan nama file “lab2.nwc”
- klik “save”

2. Kegiatan 2. Topologi 2

1. Membuat topologi



- Menyimpan topologi dan membuka topologi tersebut pada lingkungan Packet Tracer. Kemudian men-load file konfigurasi lab2.ncw.
- Melakukan langkah- langkah seperti pada kegiatan 1.

Tugas 1A : Tulis langkah pembuatan topologi.

Jawab :

Pembuatan topologi pada kegiatan 1 menggunakan tiga buah switch 2950-24 yang dirangkai menjadi bentuk segitiga tetapi bagian kiri tidak terhubung. Pada setiap switch juga dihubungkan dengan PC. Switch 0(SW 1) dihubungkan dengan PC Leo, switch 1(SW 2) dihubungkan dengan PC Aries, dan switch 3(SW 3) dihubungkan dengan PC Virgo.

Tugas 2A : Tulis langkah pemberian nama switch mulai dari mode user.

Jawab :

Switch paling atas diberi nama SW1, switch sebelah kiri diberi nama SW2 dan switch disebelah kanan diberi nama SW3.

Konfigurasi masing-masing PC dengan alamat IP.

- Leo = 172.21.1.1/24

The screenshot shows a configuration window titled 'leo' with tabs for Physical, Config, Desktop, Programming, and Attributes. The 'Desktop' tab is active, displaying the 'IP Configuration' dialog for the 'FastEthernet0' interface. The dialog has a blue title bar with a close button 'X'. It contains two main sections: 'IP Configuration' and 'IPv6 Configuration'. In the 'IP Configuration' section, the 'Static' radio button is selected, and the fields are filled with IP Address: 172.21.1.1, Subnet Mask: 255.255.255.0, Default Gateway: 0.0.0.0, and DNS Server: 0.0.0.0. The 'IPv6 Configuration' section has 'Static' selected, with fields for IPv6 Address (empty), Link Local Address (FE80::240:BFF:FED1:8B2B), IPv6 Gateway (empty), and IPv6 DNS Server (empty). At the bottom, there is a section for '802.1X' with a checkbox for 'Use 802.1X Security' which is unchecked. A 'Top' button is located at the bottom left of the window.

leo

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address 172.21.1.1

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::240:BFF:FED1:8B2B

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

☐ Top

Aries = 172.21.1.2/24

The screenshot shows a network configuration window titled "aries". It has four tabs: "Physical", "Config", "Desktop" (which is selected), and "Programming". Below the tabs is a section titled "IP Configuration" with a close button "X". Inside this section, the "Interface" is set to "FastEthernet0".

Under "IP Configuration", there are two radio buttons: "DHCP" and "Static". The "Static" option is selected. Below these are four text input fields:

- IP Address: 172.21.1.2
- Subnet Mask: 255.255.255.0
- Default Gateway: 0.0.0.0
- DNS Server: 0.0.0.0

Below the IP Configuration section is the "IPv6 Configuration" section. It has three radio buttons: "DHCP", "Auto Config", and "Static". The "Static" option is selected. Below these are four text input fields:

- IPv6 Address: (empty) / (empty)
- Link Local Address: FE80::202:4AFF:FED8:19D
- IPv6 Gateway: (empty)
- IPv6 DNS Server: (empty)

At the bottom of the configuration area is the "802.1X" section with a checkbox labeled "Use 802.1X Security" which is currently unchecked. At the very bottom of the window is a "Top" button with an unchecked checkbox.

Virgo = 172.21.1.3/24

The screenshot shows a network configuration window titled 'virgo'. It has tabs for 'Physical', 'Config', 'Desktop' (selected), 'Programming', and 'Attributes'. The 'IP Configuration' section is active, showing settings for the 'FastEthernet0' interface. The 'IP Configuration' section has two radio buttons: 'DHCP' and 'Static' (selected). Below these are input fields for 'IP Address' (172.21.1.3), 'Subnet Mask' (255.255.255.0), 'Default Gateway' (0.0.0.0), and 'DNS Server' (0.0.0.0). The 'IPv6 Configuration' section has three radio buttons: 'DHCP', 'Auto Config', and 'Static' (selected). Below these are input fields for 'IPv6 Address' (empty), 'Link Local Address' (FE80::201:63FF:FECC:47EC), 'IPv6 Gateway' (empty), and 'IPv6 DNS Server' (empty). The '802.1X' section has a checkbox for 'Use 802.1X Security' which is unchecked. A 'Top' button is at the bottom left.

IP Configuration		
Interface	FastEthernet0	
IP Configuration		
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static	
IP Address	172.21.1.3	
Subnet Mask	255.255.255.0	
Default Gateway	0.0.0.0	
DNS Server	0.0.0.0	
IPv6 Configuration		
<input type="radio"/> DHCP	<input type="radio"/> Auto Config	<input checked="" type="radio"/> Static
IPv6 Address		
Link Local Address	FE80::201:63FF:FECC:47EC	
IPv6 Gateway		
IPv6 DNS Server		
802.1X		
<input type="checkbox"/> Use 802.1X Security		

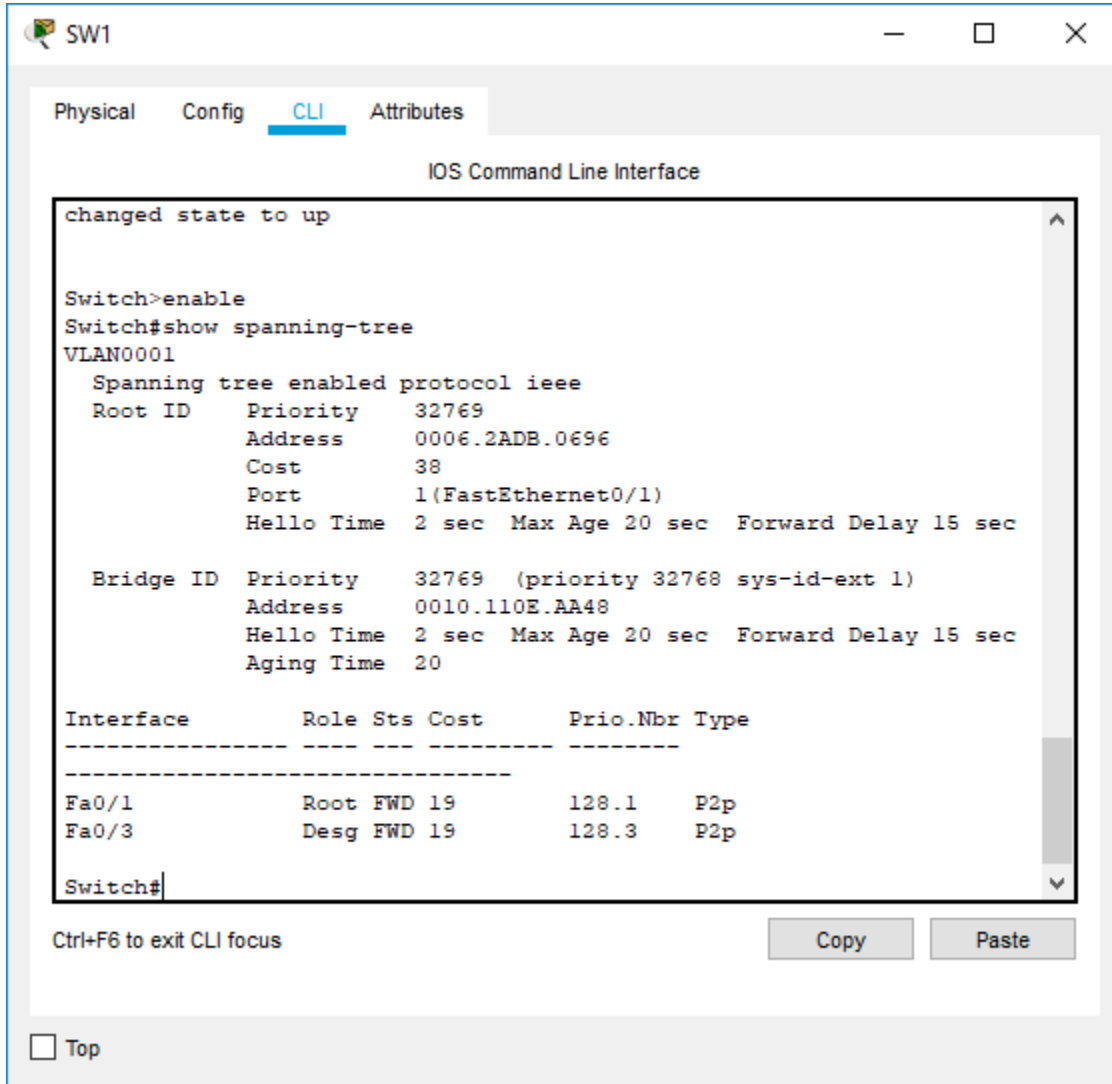
☐ Top

Pada mode user atau mode privileged, lihat status STP pada masing- masing switch. Langkah pengoperasian :

- Tekan enter
- Masuk mode privileged
- Ketik show spanning-tree

Tugas 4A : Pada kondisi default, capture masing-masing tampilan status STP switch (SW1, SW2, SW3).

Jawab:



The screenshot shows a network switch (SW1) in its CLI interface. The 'CLI' tab is selected, and the 'IOS Command Line Interface' is active. The command 'show spanning-tree' has been executed, displaying the STP status for VLAN0001. The output shows that the spanning tree is enabled using the IEEE protocol. The root bridge has a priority of 32769, address 0006.2ADB.0696, and a cost of 38. The bridge ID is 0010.110E.AA48. The interfaces Fa0/1 and Fa0/3 are shown with their roles (Root and Designated) and costs (19).

```
changed state to up

Switch>enable
Switch#show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
            Address     0006.2ADB.0696
            Cost        38
            Port        1(FastEthernet0/1)
            Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
            Address     0010.110E.AA48
            Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
            Aging Time  20

Interface          Role Sts Cost      Prio.Nbr Type
-----
Fa0/1              Root FWD 19        128.1   P2p
Fa0/3              Desg FWD 19        128.3   P2p

Switch#
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

IOS Command Line Interface

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

Switch>enable

Switch#show spanning-tree

VLAN0001

Spanning tree enabled protocol ieee

Root ID Priority 32769
 Address 0006.2ADB.0696

 This bridge is the root

 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)

 Address 0006.2ADB.0696

 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

 Aging Time 20

Interface	Role	Sts	Cost	Prio.Nbr	Type

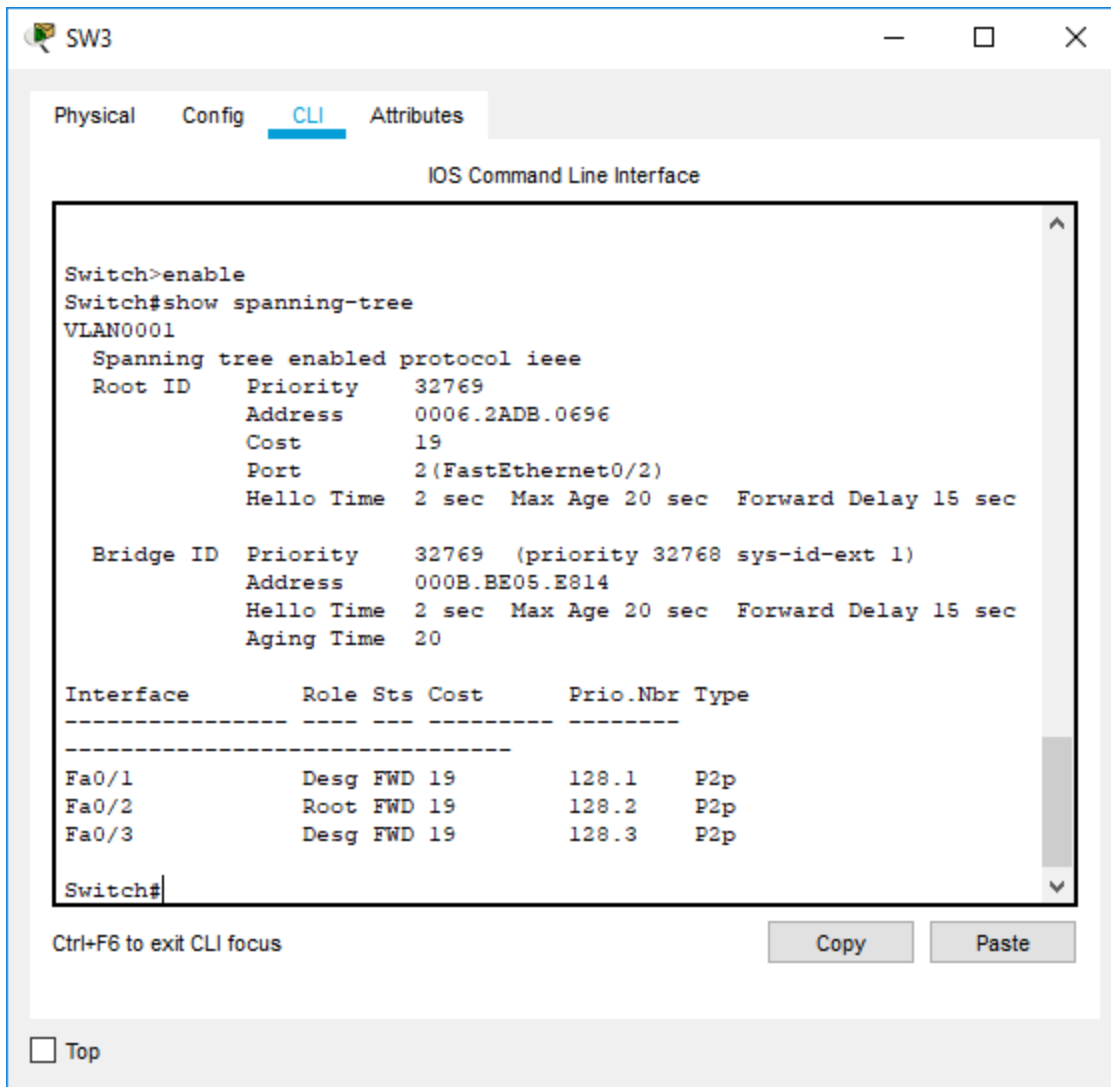
Fa0/2	Desg	FWD	19	128.2	P2p
Fa0/3	Desg	FWD	19	128.3	P2p

Switch#

Ctrl+F6 to exit CLI focus

Copy

Paste



Tugas 4B : Untuk tiap-tiap switch, isikan tabel berikut:

Jawab

SW1

NO	Variable	Nilai
1	Root ID	32769, 0006.2ADB.0696
2	Priority	32769
3	MAC Address	0006.2ADB.0696
4	Bridge ID	0010.110E.AA48
5	Cost (0/1;0/2;0/3)	Fa0/1: Root; FWD; 19; 128.1; P2p Fa0/3: Desg; FWD; 19; 128.3; P2p
6	Hello time	2 sec
7	MaxAge	20 sec
8	Forward Delay	15 sec

SW2

NO	Variable	Nilai
1	Root ID	32769, 0006.2ADB.0696
2	Priority	32769
3	MAC Address	0006.2ADB.0696
4	Bridge ID	0006.2ADB.0696
5	Cost (0/1;0/2;0/3)	Fa0/2: Desg; FWD; 19; 128.2; P2p Fa0/3: Desg; FWD; 19; 128.3; P2p
6	Hello time	2 sec
7	MaxAge	20 sec
8	Forward Delay	15 sec

SW3

NO	Variable	Nilai
1	Root ID	32769, 0006.2ADB.0696
2	Priority	32769
3	MAC Address	0006.2ADB.0696
4	Bridge ID	000B.BE05.E814
5	Cost (0/1;0/2;0/3)	Fa0/1: Desg; FWD; 19; 128.1; P2p Fa0/2: Root; FWD; 19; 128.2; P2p Fa0/3: Desg; FWD; 19; 128.3; P2p
6	Hello time	2 sec
7	MaxAge	20 sec
8	Forward Delay	15 sec

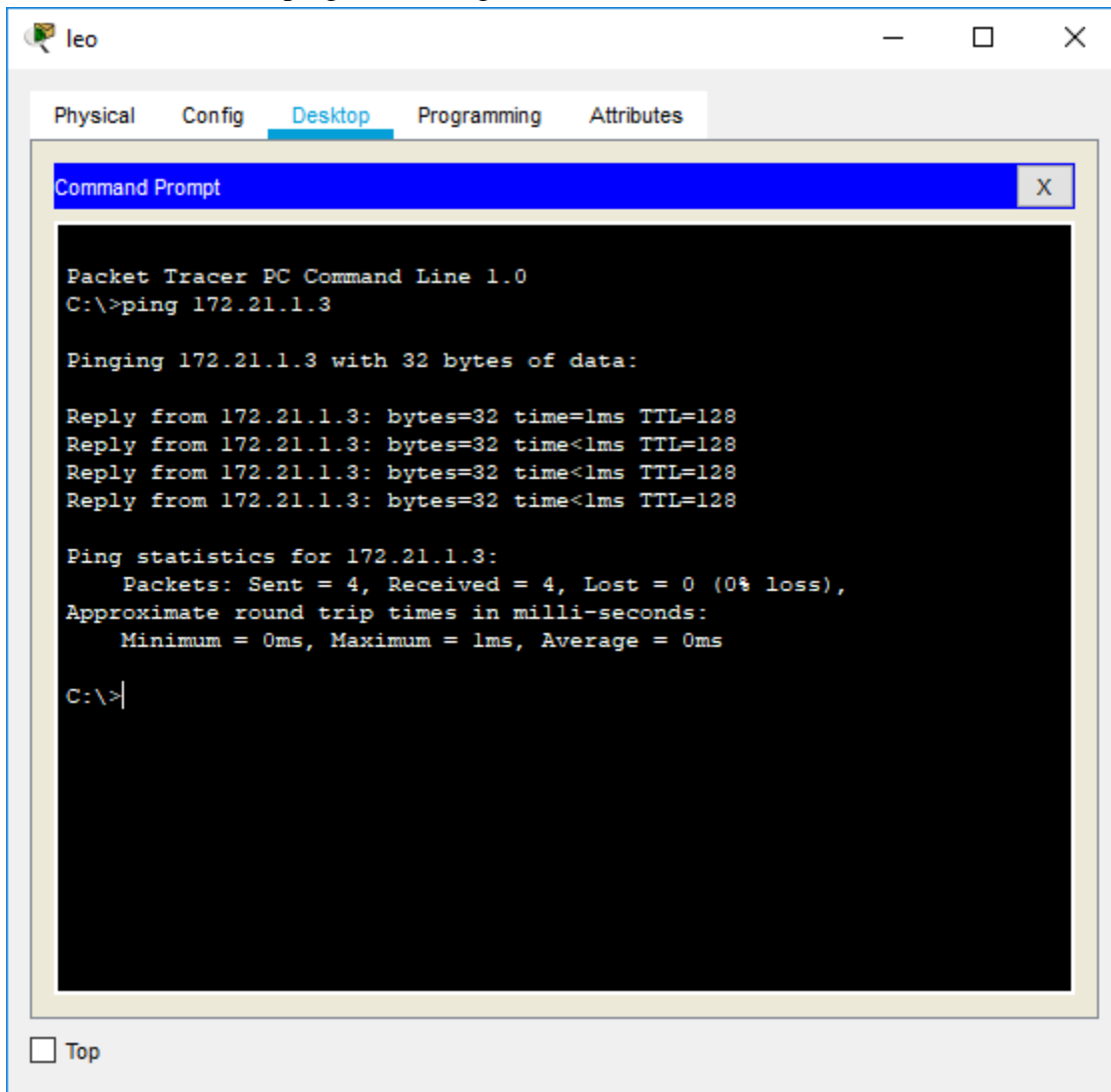
Tugas 4C: Pada kondisi default tersebut, switch dan port mana saja yang:

- Menjadi root bridge: SW1
- Menjadi designated bridge: SW1
- Menjadi root port: SW2(Fa0/3), SW3(Fa0/3)
- Menjadi designated port: SW1

Tugas 4D : Pada kondisi default tersebut, dan port mana saja yang:

- Berada pada keadaan forwarding: SW1, SW2, SW3
- Berada pada keadaan blocking: tidak ada

Dari PC Leo lakukan ping ke PC Virgo



Tugas 5A: Tulis langkah untuk melakukan perintah ping.

Jawab :

Klik PC Leo pilih menu “Desktop” lalu pilih “Command prompt” lalu ketikkan “ping 172.21.1.3” kemudian tekan enter.