LAPORAN PRAKTIKUM

Layered Network Design Simulation, Configure Extended VLANs, VTP, and DTP, Troubleshooting Inter-VLAN Routing

Oleh:

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KEMENTRIAN RISET, TEKNOLOGI DAN PERGURUAN TINGGI

POLITEKNIK NEGERI LHOKSEUMAWE

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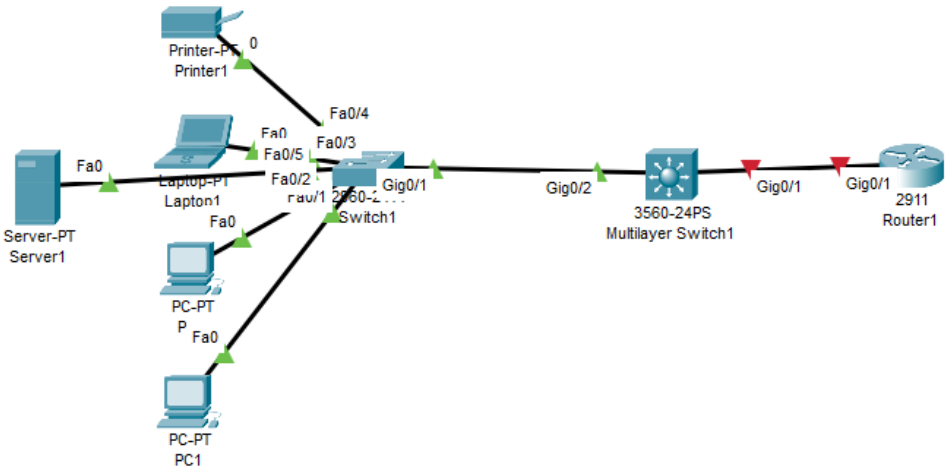
A. Layered Network Design Simulation

Step 1: Buat topologi jaringan sederhana menggunakan perangkat lunak Packet Tracer. Tempatkan perangkat di

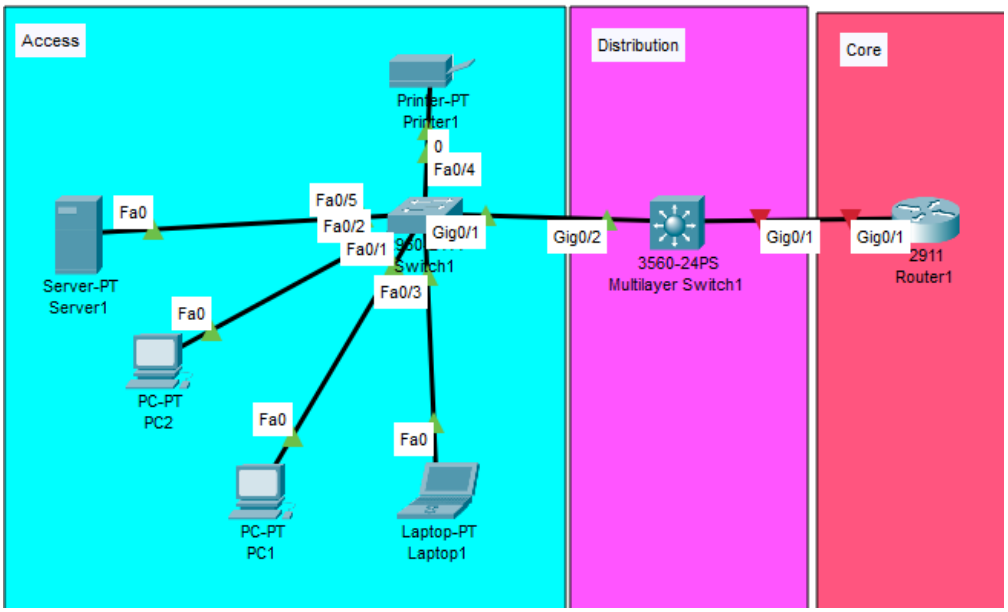
pada tingkat yang sesuai dengan desain model hierarki tiga lapis Cisco, termasuk:

- Satu router seri Cisco 2911
- Satu switch Cisco 3560
- Satu switch Cisco 2960
- Empat workstation pengguna (PC atau laptop)
- Satu printer

1. Topologi



Step 2 : Menggunakan alat gambar Packet Tracer dan menunjukkan lapisan hirarkis dengan kode warna dan label yang berbeda:



Lapisan hierarkis dalam desain jaringan biasanya terbagi menjadi tiga bagian utama dalam model jaringan Cisco. Berikut penjelasan ringkas masing-masing lapisan:

1. Lapisan Inti (Core Layer)

   Ini adalah lapisan paling atas yang bertanggung jawab untuk kecepatan dan keandalan transfer data antar perangkat. Lapisan ini fokus pada pengiriman data yang cepat dan efisien di dalam jaringan.

2. Lapisan Distribusi (Distribution Layer)

   Lapisan ini bertindak sebagai penghubung antara lapisan akses dan lapisan inti. Fungsinya termasuk menerapkan kebijakan keamanan, pengelolaan lalu lintas, dan routing antar subnet. Di sinilah kontrol jaringan dilakukan, seperti filtering dan pengalihan trafik.

3. Lapisan Akses (Access Layer)

   Lapisan ini adalah titik di mana perangkat akhir (seperti PC, printer, atau perangkat lain) terhubung ke jaringan. Lapisan ini bertanggung jawab untuk menyediakan akses ke jaringan bagi pengguna.

Model ini digunakan untuk membuat jaringan lebih mudah diatur, dioptimalkan, dan diskalakan.

Step 3: Mengkonfigurasi jaringan dan perangkat pengguna. Memeriksa konektivitas ujung ke ujung.

1. Konfigurasi R1

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int g0/1
Router(config-if)#ip addr 10.0.0.1 255.255.255.0
Router(config-if)#no sh
```

2. Konfigurasi switch Cisco 3560

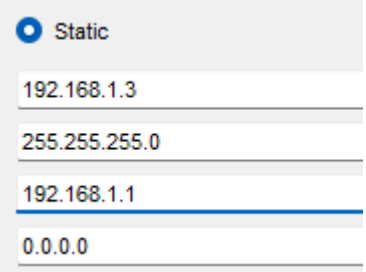
```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#int g0/1
Switch(config-if)#no sw
Switch(config-if)#
Switch(config-if)#int g0/2
Switch(config-if)#ip addr 192.168.1.1 255.255.255.0
                          ^
```

3. Konfigurasi witch Cisco 2960

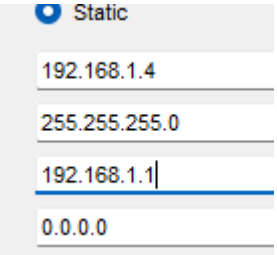
```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#int vlan 1
Switch(config-if)#ip addr 192.168.1.2 255.255.255.0
Switch(config-if)#no sh
Switch(config-if)#exit
Switch(config)#ip de
% Incomplete command.
Switch(config)#ip default-gateway 192.168.1.1
Switch(config)#end
```

4. Berikan Alamat ip pada layer akses

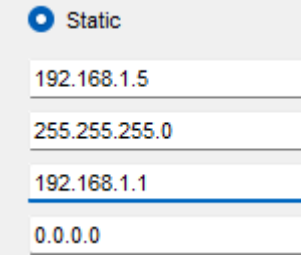
Ip pc 1



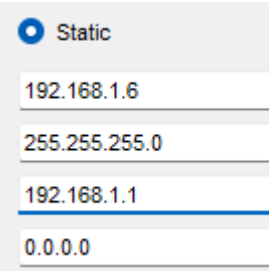
Ip pc 2



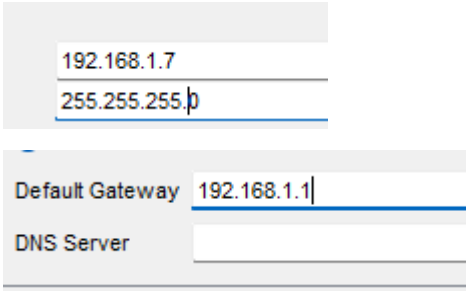
Ip laptop



Ip Serve



Ip printer



Konfigurasi egirp pada router

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#route eigrp 1
Router(config-router)#do show ip
Router(config-router)#do show ip route conneted
Translating "conneted"...domain server (255.255.255.255)
% Invalid input detected

Router(config-router)#do show ip route connected
 C    10.0.0.0/24  is directly connected, GigabitEthernet0/1

Router(config-router)#network 10.0.0.0 0.0.0.255
Router(config-router)#no auto-summary
Router(config-router)#
```

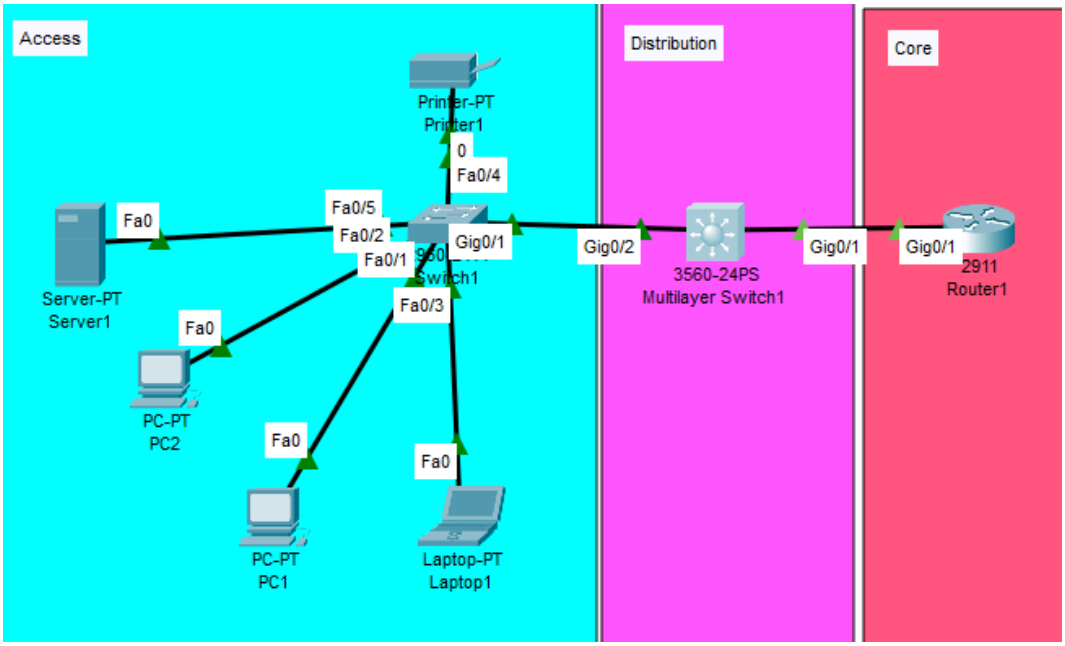
Konfigurasi eigrp pada swirch 3560

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#router eigrp 1
IP routing not enabled
Switch(config)#ip routing
Switch(config)#router eigrp 1
Switch(config-router)#do show ip route connected
 C    10.0.0.0/24  is directly connected, GigabitEthernet0/1
 C    192.168.1.0/24  is directly connected, GigabitEthernet0/2

Switch(config-router)#network 10.0.0.0 0.0.0.255
Switch(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 10.0.0.1 (GigabitEthernet0/1) is up: new
adjacency

Switch(config-router)#network 192.168.1.0 0.0.0.255
Switch(config-router)#no auto-summary
Switch(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 10.0.0.1 (GigabitEthernet0/1) resync: summary
configured
```

Melakukan pengecekan pc 1 ke semua ip

```
Ping statistics for 192.168.1.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.1.6

Pinging 192.168.1.6 with 32 bytes of data:

Reply from 192.168.1.6: bytes=32 time<1ms TTL=128
Reply from 192.168.1.6: bytes=32 time<1ms TTL=128
Reply from 192.168.1.6: bytes=32 time<1ms TTL=128
Reply from 192.168.1.6: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.6:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

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=254
Reply from 10.0.0.1: bytes=32 time<1ms TTL=254
Reply from 10.0.0.1: bytes=32 time<1ms TTL=254
Reply from 10.0.0.1: bytes=32 time<1ms TTL=254

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 = 0ms, Average = 0ms
```

2. Hasil Akhir



3. KESIMPULAN

Kesimpulan dari praktikum ini adalah:

- Desain jaringan hierarkis penting karena membuat jaringan lebih terstruktur, mudah dikelola, dan bisa diperbesar sesuai kebutuhan.

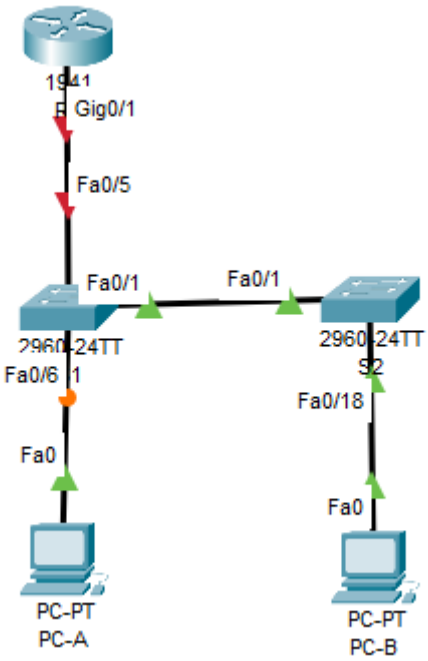
- Setiap lapisan jaringan (akses, distribusi, dan inti) punya fungsi khusus yang membantu mengatur lalu lintas data dan memastikan koneksi yang efisien.

- Packet Tracer memudahkan simulasi jaringan nyata tanpa perlu perangkat keras, sehingga membantu belajar konfigurasi dan troubleshooting.

- Kolaborasi penting karena berbagi hasil dengan teman atau instruktur memberi kesempatan untuk evaluasi dan perbaikan desain.

B. Troubleshooting Inter-VLAN Routing

Topologi



A. Membangun Jaringan dan Memuat Konfigurasi Perangkat

Step 1 : Sambungkan kabel jaringan seperti yang ditunjukkan pada topologi.

Step 2 : Mengkonfigurasi host PC.

Step 3 : Memuat konfigurasi router dan swtich

1. Konfigurasi R1

```
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R1
R1(config)#enable secret class
R1(config)#no ip domain lookup
R1(config)#line con 0
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#logging synchronous
R1(config-line)#line vty 0 4
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#interface loopback0

R1(config-if)#ip address 209.165.200.225 255.255.255.224
R1(config-if)#interface gigabitEthernet0/1
R1(config-if)#no ip address
R1(config-if)#interface gigabitEthernet0/1.1
R1(config-subif)#encapsulation dot1q 11
R1(config-subif)#ip address 192.168.1.1 255.255.255.0
R1(config-subif)#interface gigabitEthernet0/1.10
R1(config-subif)#encapsulation dot1q 10
R1(config-subif)#ip address 192.168.11.1 255.255.255.0
R1(config-subif)#interface gigabitEthernet0/1.20
R1(config-subif)#encapsulation dot1q 20
R1(config-subif)#ip address 192.168.20.1 255.255.255.0
R1(config-subif)#end
%LINK-5-CHANGED: Interface Loopback0, changed state to up

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

R1(config-subif)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console
```

2. Konfigurasi S1

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#enable secret class
S1(config)#no ip domain-lookup
S1(config)#line con 0
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#logging synchronous
S1(config-line)#line vty 0 15
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#vlan 10
S1(config-vlan)#name R&amp;amp;D
S1(config-vlan)#exit
S1(config)#interface fastethernet0/1
S1(config-if)#switchport mode access
S1(config-if)#interface fastethernet0/5
S1(config-if)#switchport mode trunk
S1(config-if)#interface vlan1
S1(config-if)#ip address 192.168.1.11 255.255.255.0
S1(config-if)#ip default-gateway 192.168.1.1
S1(config)#end
S1#
%SYS-5-CONFIG_I: Configured from console by console
```

3. Konfigurasi S2

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S2
S2(config)#enable secret class
S2(config)#no ip domain-lookup
S2(config)#line con 0
S2(config-line)#password cisco
S2(config-line)#login
S2(config-line)#logging synchronous
S2(config-line)#line vty 0 15
S2(config-line)#password cisco
S2(config-line)#login
S2(config-line)#vlan 20
S2(config-vlan)#name Engineering
S2(config-vlan)#exit
S2(config)#interface fastethernet0/1
S2(config-if)#switchport mode trunk

S2(config-if)#interface fastethernet0/18
S2(config-if)#switchport access vlan 10
% Access VLAN does not exist. Creating vlan 10
S2(config-if)#switchport mode access
S2(config-if)#interface vlan1
S2(config-if)#ip address 192.168.1.12 255.255.255.0
S2(config-if)#ip default-gateway 192.168.1.1
S2(config)#end
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

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

S2(config)#end
S2#
%SYS-5-CONFIG_I: Configured from console by console

S2#
```

4. Verifikasi Konfigurasi VLAN, Penetapan Port, dan Trunking

   Verifikasi R1

```
interface Loopback0
 ip address 209.165.200.225 255.255.255.224
!
interface GigabitEthernet0/0
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface GigabitEthernet0/1
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/1.1
 encapsulation dot1Q 1 native
 ip address 192.168.1.1 255.255.255.0
!
interface GigabitEthernet0/1.10
 encapsulation dot1Q 10
 ip address 192.168.10.1 255.255.255.0
!
interface GigabitEthernet0/1.20
 encapsulation dot1Q 20
 ip address 192.168.20.1 255.255.255.0
!
interface Vlan1
 no ip address
 shutdown
!
ip classless
!
ip flow-export version 9
!
```

Verifikasi S1

```
VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/2, Fa0/3, Fa0/4, 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   R&amp;D                           active    Fa0/6
20   Engineering                       active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
```

Verivikasi S2

```
1    default                           active    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
                                                 Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                                 Fa0/23, Fa0/24, Gig0/1, Gig0/2
10   R&D                               active
20   Engineering                       active    Fa0/18
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
```

5. Uji Konektivitas Lapisan 3

```
C:\>ping 192.168.1.12

Pinging 192.168.1.12 with 32 bytes of data:

Reply from 192.168.1.12: bytes=32 time<1ms TTL=254
Reply from 192.168.1.12: bytes=32 time<1ms TTL=254
Reply from 192.168.1.12: bytes=32 time<1ms TTL=254
Reply from 192.168.1.12: bytes=32 time<1ms TTL=254

Ping statistics for 192.168.1.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.3

Pinging 192.168.20.3 with 32 bytes of data:

Reply from 192.168.20.3: bytes=32 time<1ms TTL=127
Reply from 192.168.20.3: bytes=32 time<1ms TTL=127
Reply from 192.168.20.3: bytes=32 time<1ms TTL=127
Reply from 192.168.20.3: bytes=32 time=18ms TTL=127

Ping statistics for 192.168.20.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 18ms, Average = 4ms

C:\>tracert 192.168.1.11

Tracing route to 192.168.1.11 over a maximum of 30 hops:

  1    0 ms      1 ms      0 ms      192.168.10.1
  2    0 ms      0 ms      0 ms      192.168.1.11

Trace complete.
```

B. KESIMPULAN

Kesimpulan dari uji lab Troubleshooting Inter-VLAN Routing adalah:

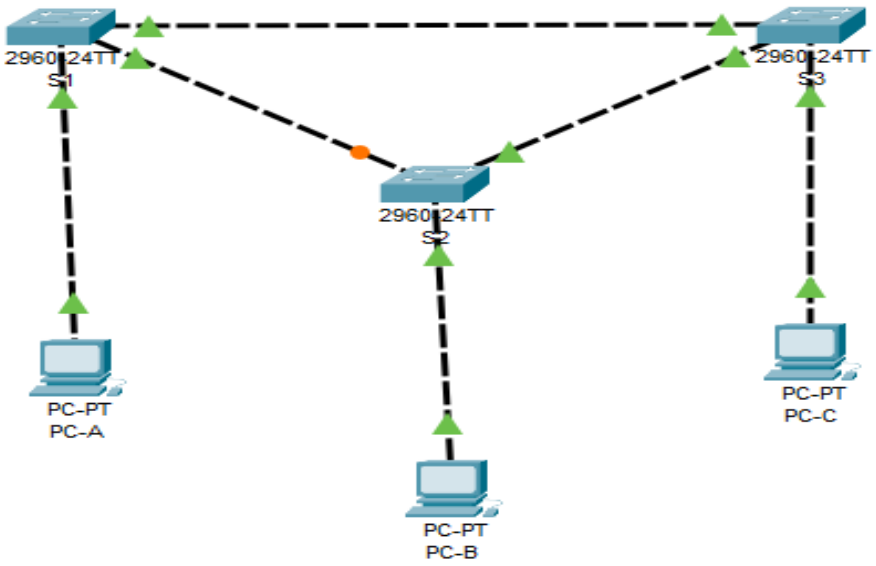
- Routing Antar-VLAN: Lab ini memverifikasi dan memperbaiki konfigurasi routing antar-VLAN menggunakan router-on-a-stick.
- Verifikasi Trunking dan VLAN: Port trunking dan penugasan VLAN harus dikonfigurasi dengan benar untuk mendukung lalu lintas antar-VLAN.

- Pengujian Konektivitas: Konektivitas antar perangkat diuji menggunakan ping untuk memastikan konfigurasi IP dan VLAN benar.
- Troubleshooting: Jika ada masalah, perintah diagnostik seperti `show ip route` dan `show vlan brief` membantu mengidentifikasi dan memperbaiki kesalahan.

Lab dianggap selesai ketika konektivitas antar semua VLAN dan jaringan eksternal berhasil.

C. Mengkonfigurasi VLAN yang Diperluas, VTP, dan DTP

Topologi



1. Mengkonfigurasi VTP

   a. Konfigurasi VTP pada Switch 1

```
Switch>en
Switch#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#vtp domain CCNA
Changing VTP domain name from NULL to CCNA
S1(config)#vtp mode client
Setting device to VTP CLIENT mode.
S1(config)#vtp password cisco
Setting device VLAN database password to cisco
S1(config)#end
S1#
%SYS-5-CONFIG_I: Configured from console by console
```

b. Melihat Status VTP Switch 1

```
S1#show vtp status
VTP Version capable             : 1 to 2
VTP version running             : 1
VTP Domain Name                 : CCNA
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 0040.0B08.E400
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00

Feature VLAN :
--------------
VTP Operating Mode                : Client
Maximum VLANs supported locally   : 255
Number of existing VLANs          : 5
Configuration Revision            : 0
MD5 digest                        : 0x8C 0x29 0x40 0xDD 0x7F 0x7A 0x63 0x17
                                    0xA8 0x51 0x50 0x17 0x4F 0x94 0x05 0x57
```

c. Melihat interface fa0/1 switchport pada Swtich 1

```
S1#show interface f0/1 switchport
Name: Fa0/1
Switchport: Enabled
Administrative Mode: dynamic auto
Operational Mode: static access
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: native
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Voice VLAN: none
Administrative private-vlan host-association: none
Administrative private-vlan mapping: none
Administrative private-vlan trunk native VLAN: none
Administrative private-vlan trunk encapsulation: dot1q
Administrative private-vlan trunk normal VLANs: none
Administrative private-vlan trunk private VLANs: none
Operational private-vlan: none
Trunking VLANs Enabled: All
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
Protected: false
 --More--
```

d. Konfigurasi VTP swtich S2

```
Switch>EN
Switch#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S2
S2(config)#vtp domain CCNA
Changing VTP domain name from NULL to CCNA
S2(config)#vtp mode server
Device mode already VTP SERVER.
S2(config)#vtp password cisco
```

e. Melihat Status VTP swtich 2

```
S2(config)#end
S2#
%SYS-5-CONFIG_I: Configured from console by console

S2#show vtp status
VTP Version capable             : 1 to 2
VTP version running             : 1
VTP Domain Name                 : CCNA
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 000B.BE83.5100
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00
Local updater ID is 0.0.0.0 (no valid interface found)

Feature VLAN :
--------------
VTP Operating Mode                : Server
Maximum VLANs supported locally   : 255
Number of existing VLANs          : 5
Configuration Revision            : 0
MD5 digest                        : 0x8C 0x29 0x40 0xDD 0x7F 0x7A 0x63 0x17
                                    0xA8 0x51 0x50 0x17 0x4F 0x94 0x05 0x57
S2#
```

f. Melihat interface0/1 switchport pada Switch S1

```
S2>show interface f0/1 switchport
Name: Fa0/1
Switchport: Enabled
Administrative Mode: dynamic auto
Operational Mode: static access
Administrative Trunking Encapsulation: dotlq
Operational Trunking Encapsulation: native
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Voice VLAN: none
Administrative private-vlan host-association: none
Administrative private-vlan mapping: none
Administrative private-vlan trunk native VLAN: none
Administrative private-vlan trunk encapsulation: dotlq
Administrative private-vlan trunk normal VLANs: none
Administrative private-vlan trunk private VLANs: none
Operational private-vlan: none
Trunking VLANs Enabled: All
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
Protected: false
```

g. Konfigurasi VTP switch s3

```
Switch>en
Switch#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S3
S3(config)#vtp domain CCNA
Changing VTP domain name from NULL to CCNA
S3(config)#vtp mode client
Setting device to VTP CLIENT mode.
S3(config)#vtp password cisco
Setting device VLAN database password to cisco
```

h. Melihat status VTP S3

```
S3#show vtp status
VTP Version capable             : 1 to 2
VTP version running             : 1
VTP Domain Name                 : CCNA
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 00D0.FF89.3700
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00

Feature VLAN :
--------------
VTP Operating Mode                : Client
Maximum VLANs supported locally   : 255
Number of existing VLANs          : 5
Configuration Revision            : 0
MD5 digest                        : 0x8C 0x29 0x40 0xDD 0x7F 0x7A 0x63 0x17
                                    0xA8 0x51 0x50 0x17 0x4F 0x94 0x05 0x57
```

2. Konfigurasi dynamic trunk switch S1

```
S1(config)#interface f0/1
S1(config-if)#switchport mode dynamic desirable

S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

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

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

S1(config-if)#
```

a. Melihat interfaces trunk pada switch S1

```
S1#show interfaces trunk
Port        Mode         Encapsulation  Status        Native vlan
Fa0/1       desirable    n-802.1q       trunking      1

Port        Vlans allowed on trunk
Fa0/1       1-1005

Port        Vlans allowed and active in management domain
Fa0/1       1

Port        Vlans in spanning tree forwarding state and not pruned
Fa0/1       1
```

b. Melihat interfaces trunk pada switch S2

```
S2#show interfaces trunk
Port        Mode         Encapsulation  Status        Native vlan
Fa0/1       auto         n-802.1q       trunking      1

Port        Vlans allowed on trunk
Fa0/1       1-1005

Port        Vlans allowed and active in management domain
Fa0/1       1

Port        Vlans in spanning tree forwarding state and not pruned
Fa0/1       none
```

c. Konfigurasikan sambungan trunk statis antara S1 dan S3 dan melihat update interfaces trunk pada S1

```
S1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#interface f0/3
S1(config-if)#switchport mode trunk

S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to down

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

S1(config-if)#end
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#show interfaces trunk
Port        Mode         Encapsulation  Status        Native vlan
Fa0/1       desirable    n-802.1q       trunking      1
Fa0/3       on           802.1q         trunking      1

Port        Vlans allowed on trunk
Fa0/1       1-1005
Fa0/3       1-1005

Port        Vlans allowed and active in management domain
Fa0/1       1
Fa0/3       1

Port        Vlans in spanning tree forwarding state and not pruned
Fa0/1       1
Fa0/3       none
```

d. Melakukan konfigurasi VLAN pada Switch S2

```
S2(config)#vlan 10
S2(config-vlan)#name Red
S2(config-vlan)#vlan 20
S2(config-vlan)#name Blue
S2(config-vlan)#vlan 30
S2(config-vlan)#name Yellow
S2(config-vlan)#vlan 99
S2(config-vlan)#name Management
S2(config-vlan)#end
```

e. Melihat VLAN yang sudah dikonfigurasi pada switch S2

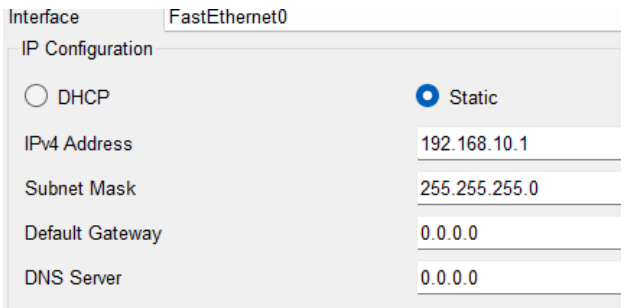
```
S2#show vlan brief

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/2, 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
10   Red                               active
20   Blue                              active
30   Yellow                            active
99   Management                        active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
S2#
```

f. Menampilkan pembaharuan VTP pada S1 dan S3

```
S1#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/2, 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
10   Red                               active
20   Blue                              active
30   Yellow                            active
99   Management                        active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
10   enet  100010     1500  -      -      -        -    -        0      0
20   enet  100020     1500  -      -      -        -    -        0      0
30   enet  100030     1500  -      -      -        -    -        0      0
99   enet  100099     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
1004 fdnet 101004     1500  -      -      -        ieee -        0      0
1005 trnet 101005     1500  -      -      -        ibm  -        0      0

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------

Remote SPAN VLANs
------------------------------------------------------------------------------

Primary Secondary Type              Ports
------- --------- ----------------- ------------------------------------------
```

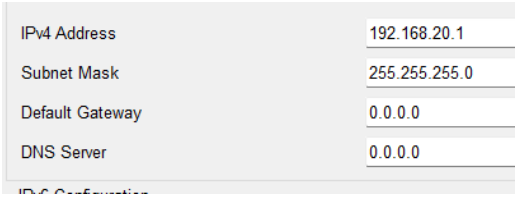
g. Mengatur Port ke VLAN Switch S1 dan menambahkan IP pada PC-A

```
S1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#int f0/6
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 10
S1(config-if)#
```



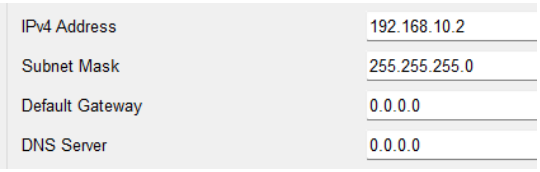
h. Mengatur Port ke VLAN Switch S2 dan menambahkan IP pada PC-B

```
S2>
S2>en
S2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
S2(config)#interface f0/18
S2(config-if)#switchport mode access
S2(config-if)#switchport access vlan 10
S2(config-if)#
```



i. Mengatur Port ke VLAN Switch S3 dan menambahkan IP pada PC-C

```
S3#en
S3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
S3(config)#interface f0/18
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 10
S3(config-if)#
```



j. Konfigurasikan alamat IP pada semua switch .

1. Switch 1

```
S3#en
S3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
S3(config)#interface f0/18
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 10
S3(config-if)#no shutdown
```

2. Switch 2

```
S2(config)#interface vlan 99
S2(config-if)#
%LINK-5-CHANGED: Interface Vlan99, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed state to up

S2(config-if)#ip address 192.168.99.2 255.255.255.0
S2(config-if)#no shutdown
```

3. Switch

```
S3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
S3(config)#interface f0/18
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 10
S3(config-if)#no shutdown
S3(config-if)#in vlan 99
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan99, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed state to up

S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shutdown
```

3. Percobaan Ping

a. Ping PC-A ke PC-B

```
Pinging 192.168.10.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

Pada percobaan ping PC-A ke PC-B jelas dia akan RTO dikarenakan VLAN tidak berada dalam jaringan yang sama.

b. Melakukan Ping PC-A dari PC-C. apakah berhasil? Jelaksan

```
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=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128

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
```

Pada saat dilakukan ping, pengiriman berhasil di lakukan disebabkan VLAN berada dalam satu jaringan yang sama

c. Melakukan Ping PC-A dari Switch S1. Apakah berhasil? Jelaskan

```
S1#ping 192.168.10.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

S1#
```

Saat di ping jelas tidak bisa disebabkan VLAN tidak berada di jaringan yang sama.

d. Melakukan ping Switch S1 dan S2

```
S2#ping 192.168.99.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.99.1, timeout is 2 seconds:
..!!!
Success rate is 60 percent (3/5), round-trip min/avg/max = 0/0/0 ms

S2#ping 192.168.99.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.99.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
```

Saat di ping bisa di lihat swicht 1 dan 2 saling terhubung karena berada di jaringan yang sama

4. Melakukan konfigurasi VLAN yang diperluas dan melihat status VTP

```
S1#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#vtp mode transparent
Setting device to VTP TRANSPARENT mode.
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#show vtp status
VTP Version                     : 2
Configuration Revision          : 0
Maximum VLANs supported locally : 255
Number of existing VLANs        : 9
VTP Operating Mode              : Transparent
VTP Domain Name                 : CCNA
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0x71 0x52 0x80 0xEA 0x59 0x8F 0x68 0x0A
Configuration last modified by 0.0.0.0 at 3-1-93 00:18:38
S1#
```

a. Melakukan Konfigurasikan mode VTP ke transparan pada S1

```
VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
10   enet  100010     1500  -      -      -        -    -        0      0
20   enet  100020     1500  -      -      -        -    -        0      0
30   enet  100030     1500  -      -      -        -    -        0      0
99   enet  100099     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
1004 fdnet 101004     1500  -      -      -        ieee -        0      0
1005 trnet 101005     1500  -      -      -        ibm  -        0      0

Remote SPAN VLANs
------------------------------------------------------------------------------

Primary Secondary Type              Ports
------- --------- ----------------- ------------------------------------------
S1#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#vlan 2000
```

5. Apa saja keuntungan dan kerugian menggunakan VTP?

   Keuntungan dan Kerugian

   1. Keuntungan:
      - Mudah Mengelola VLAN: VTP otomatis menyebarkan konfigurasi VLAN ke semua switch.
      - Konsisten: Semua switch punya pengaturan VLAN yang sama.

- Hemat Waktu: Tidak perlu menambahkan VLAN satu per satu di setiap switch.

2. Kerugian:
    - Rentan Kesalahan: Jika ada kesalahan di server VTP, seluruh jaringan bisa terkena dampaknya.
    - Kompatibilitas: Versi VTP yang berbeda bisa membuat switch sulit berbagi informasi.
    - Terbatas: VLAN di atas 1005 tidak bisa dikelola oleh VTP.

Kesimpulan

VTP memudahkan pengelolaan VLAN di jaringan, tetapi harus hati-hati agar tidak terjadi kesalahan yang menyebar ke seluruh switch. Untuk VLAN besar, perlu mode manual (transparent).