TUGAS MATA KULIAH

Network Design

Desain & Manajemen Jaringan A

Oleh:

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FAKULTAS ILMU KOMPUTER
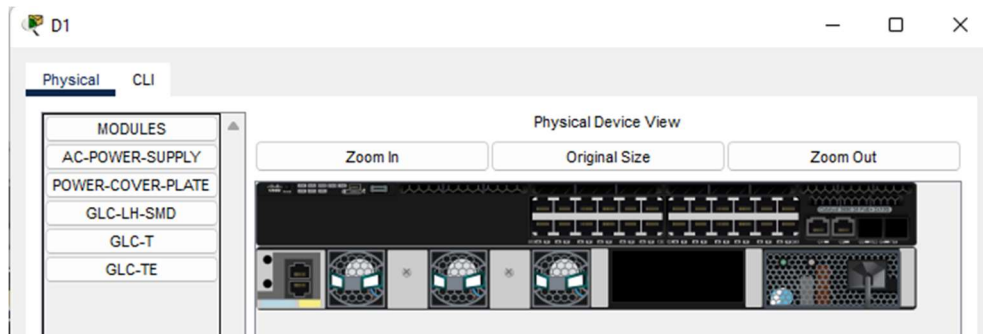
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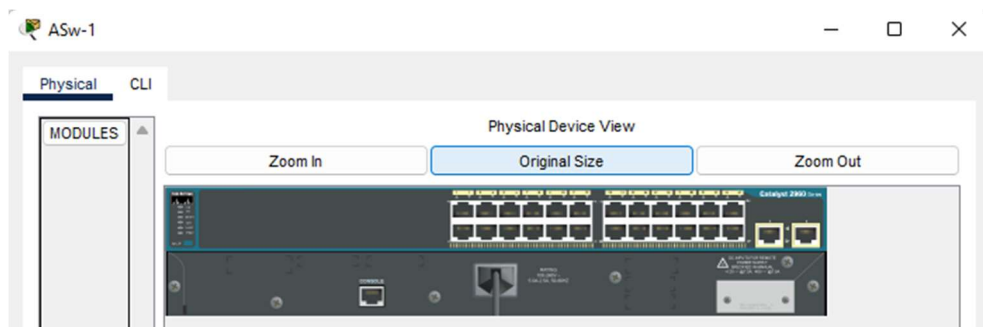**Part 1: Compare Layer 2 and Layer 3 Switches**

Step 1: Explore the Physical Workspace.

b. **In the Rack, locate the devices D1 and ASw-1. Examine the physical aspects of D1 and ASw-1. If you need to examine the devices more closely, click the device and select the Physical tab.**

Gambar Switch **D1 (3650-24PS)**

Gambar Switch **ASw-1 (2960-24TT)**

Each individual switch has how many physical switchports?

Pada switch ASw-1 (2960) terdapat 26 port tetap, sementara pada switch D1 (3650) terdapat 24 port tetap dan 4 port modular.

How many Fast Ethernet and Gigabit Ethernet switchports does each switch have?

Switch 2960 memiliki 24 port Fast Ethernet dan 2 Gigabit Ethernet, sementara switch 3650 memiliki 24 port Gigabit Ethernet (tetap) dan 4 port Gigabit Ethernet (modular).

List the transmission speed of the Fast Ethernet and Gigabit Ethernet switchports on each switch.

Port Fast Ehernet mendukung kecepatan 10/100mb/s, sementara port Gigabit Ethernet mendukung kecepatan 1000mb/s.

Are either of the two switches modular in design?

Ya, switch 3650 memiliki 4 port modular.

Step 2: In the CLI tab

a. The switchports of a 3650 switch can be configured as Layer 3 interfaces by entering the `no switchport` command in interface configuration mode. This allows technicians to assign an IP address and subnet mask to the switchport in the same way that they are configured on a router interface.

What is the difference between a Layer 2 switch and a Layer 3 switch?

Switch layer 2 melakukan forwarding berdasar alamat L2 (MAC). Sedangkan switch layer 3 dapat dikonfigurasi dengan alamat IP serta protokol routing seperti router.

What is the difference between a switch's physical interface and the VLAN interface?

Interface fisik pada switch digunakan untuk menghubungkan perangkat dengan jaringan secara fisik. Sedangkan VLAN adalah sebuah interface virtual yang digunakna untuk mengkonfigurasi switch dengan alamat IP supaya dapat dikonfigurasi dari jarak jauh.
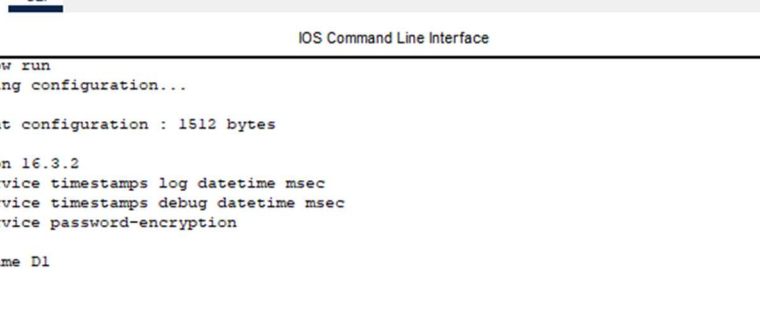
At which layers do 2960 and 3650 switches operate?

Switch 2960 beroperasi pada layer 2, switch 3650 beroperasi pada layer 2 dan 3.

b. Navigate to the CLI tab for both devices. Issue the `show run` command to examine the configurations of the D1 and ASw-1 switches.

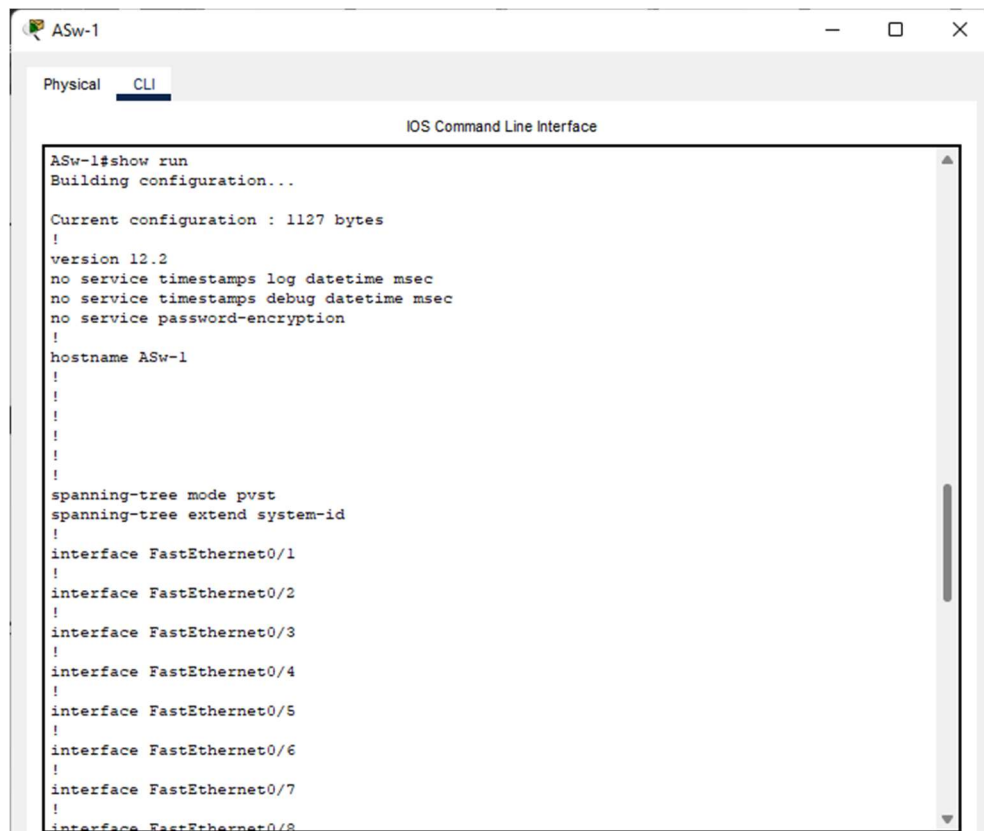**Do you notice any differences between them?**
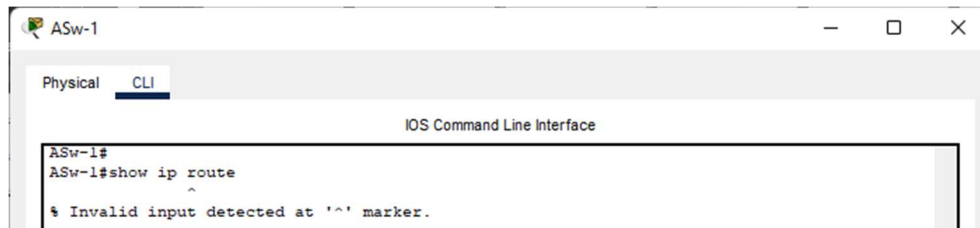
Switch **D1**

Switch **ASw-1**

Pada switch D1, semua port adalah port Gigabit Ethernet, sedangkan pada switch ASw-1, mayoritas port adalah port Fast Ethernet dan terdapat 2 port Gigabit Ethernet yang ditujukan untuk jalur koneksi antar switch. Selain itu, pada switch D1 terdapat port yang dikonfigurasi dengan alamat IP, sedangkan pada switch ASw-1 tidak ada.

Try to display the routing table on D1 and ASw-1 using the `show ip route` command.

Switch **D1**
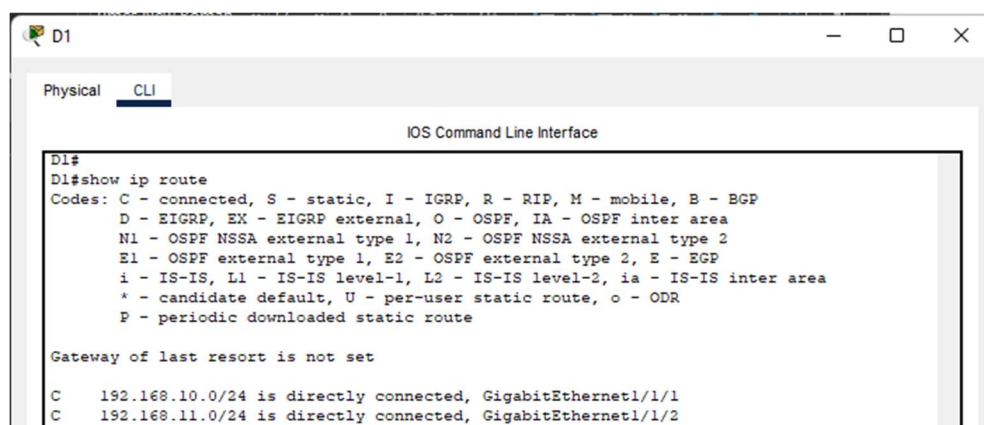
Switch **ASw-1**

Why do you think the command does not work on ASw-1 but works on D1?

Perintah show ip route berfungsi pada switch D1 karena switch tersebut berjalan pada layer 2 dan 3 yang memungkinkannya berfungsi sebagai switch layer 2 serta mengarahkan paket berdasar informasi layer 3 (alamat IP). Perintah tersebut tidak dapat digunakan pada switch ASw-1 karena switch tersebut merupakan switch layer 2 sehingga tidak meiliki tabel routing.

Part 2: Compare a Layer 3 Switch and a Router

In the past, switches and routers have been separate and distinct devices. The term switch was set aside for hardware devices that function at Layer 2. Routers, on the other hand, are devices that make forwarding decisions based on Layer 3 information. They use routing protocols to share routing information and to communicate with other routers. Layer 3 switches, such as the 3650, can be configured to forward Layer 3 packets. Entering the ip routing command in global configuration mode allows Layer 3 switches to be configured with routing protocols, which gives them some of the capabilities of a router. Although similar in some ways, Layer 3 switches are different from routers in many other aspects.

Step 1: Compare D1 and R1

a. **Open the Physical tab on D1 and R1.**

Gambar Switch **D1 (3650-24PS)**

Gambar Router **R1 (ISR4321)**

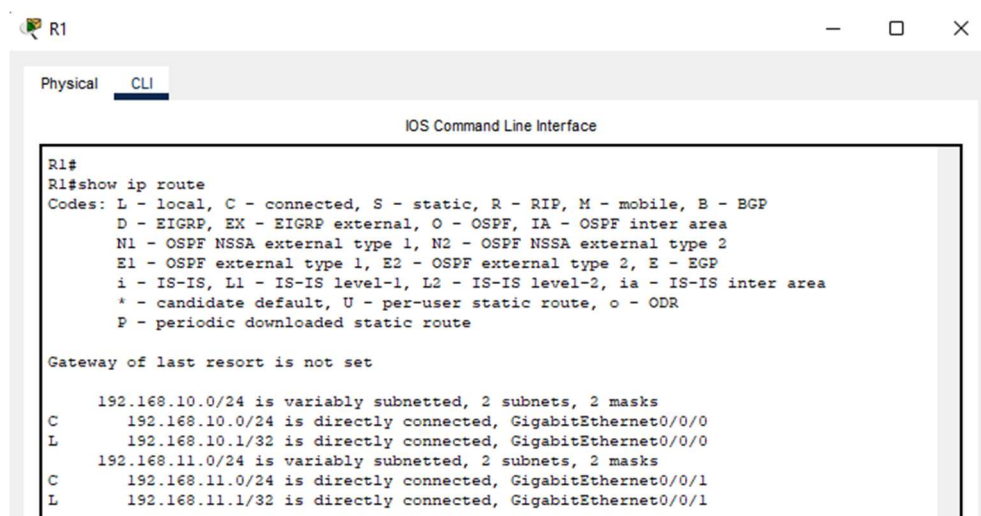**Do you notice any similarities between the two? Do you notice any differences between the two?**
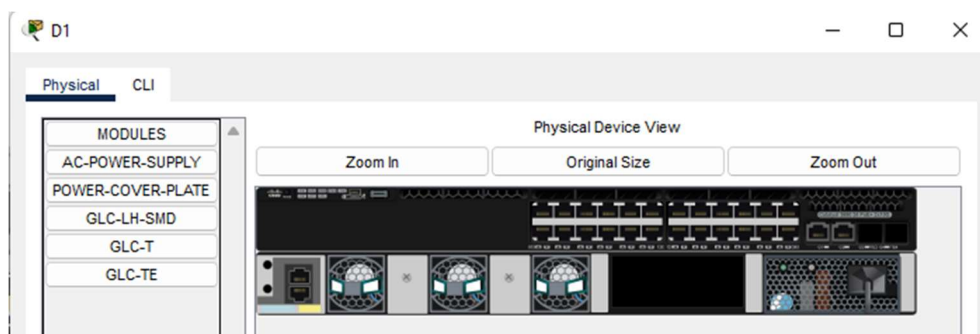
Keduanya memiliki sebuah port console, port USB, dan interface Gigabit Ethernet, serta keduanya modular. **R1** memiliki interface Serial sementara **D1** hanya memiliki interface Ethernet. **R1** dapat menggunakan berbagai macam media transmisi tergantung pada modul yang digunakan, sementara **D1** hanya dapat menggunakan Ethernet (tembaga maupun fiber) tergantung pada port yang terpasang. **D1** memiliki lebih banyak port Gigabit Ethernet daripada **R1**.

b. **In the CLI tab, issue the** `show run` **command and examine the configurations of R1 and D1.**

Switch **D1**

Router **R1**

What differences do you see between the two?

R1 dan D1 memiliki alamat IP yang sama tetapi pada interface yang berbeda.

Which command allows configuration of D1 with an IP address on one of its physical interfaces?

Perintah `no switchport`.

c. **Use the `show ip route` command on both devices.**

Switch **D1**

Router **R1**

Do you see any similarities or differences between the two tables?

Pada router terdapat kode L yang berarti Local. Hal tersebut merupakan jalur yang terkonfigurasi pada interface fisik R1. Kedua perangkat menampilkan jaringan yang sama pada tabel routingnya.

Step 2: Compare R2 and D2

a. **Now, analyze the routing table of R2 and D2. Click both devices in the Rack. In the CLI tab, issue the** `show ip route` **command.**

Router **R2**

Switch **D2**

What is present now that was not present in the configuration of R1 and D1?
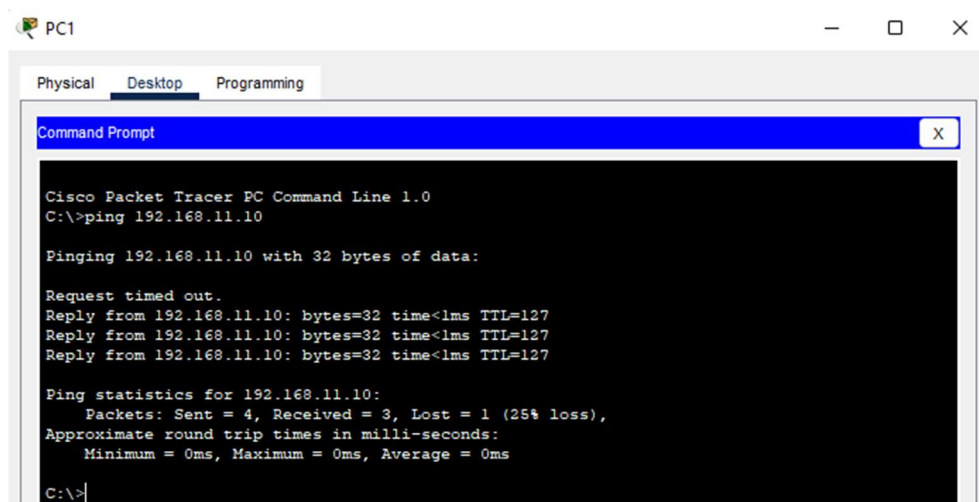
Terdapat konfigurasi OSPF pada kedua perangkat.

Which network is in the routing table of D2 that was learned from R2?

Jaringan 1.1.1.0/24 didapat dari R2

b. **Click the Back Level icon (Alt + Left) to leave the Main Wiring Closet. Verify that each topology has full connectivity by completing the following tests:**
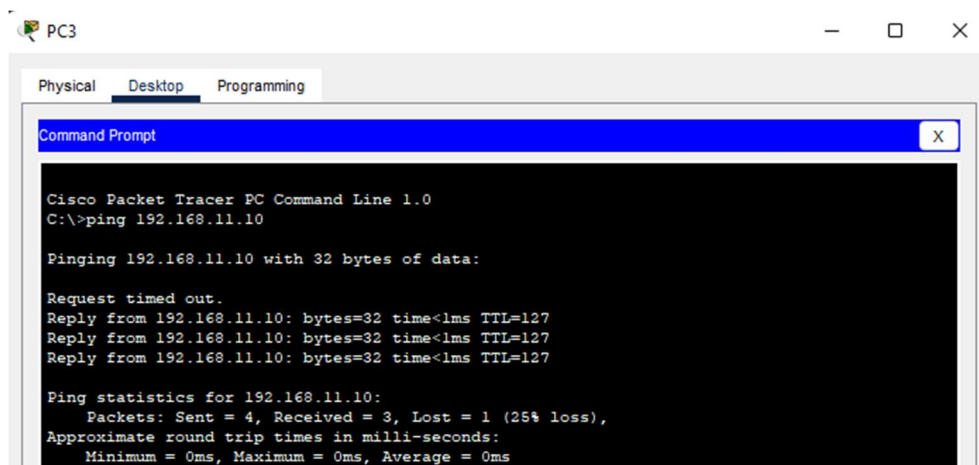
- **Ping from PC1 to PC2**

- **Ping from PC3 to PC4**

- **Ping from PC5 to PC6 and PC7**

Which device is used to provide communication between networks?

Router atau switch multilayer.

Why were we able to ping across networks without there being a router?

Menggunakan switch multilayer yang terkonfigurasi dengan alamat IP dan IP routing telah aktif.

Bonus question: We say that routers are Layer 3 devices and conventional (non-Layer 3) switches are Layer 2 devices. However, we can assign an IP address to a management (SVI) interface of a Layer 2 switch. How is this possible if switches are Layer 2 devices?

Switch layer 2 managed memiliki server tertanam yang dapat diakses melalui layer 3. Server tersebut memungkinkan akses Telnet, SSH, atau HTTP menuju switch dari jaringan sehingga switch tersebut dapat dikonfigurasi dari jarak jauh.