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# Packet Tracer - Use Diagnostic Commands

## Objectives

**Part 1: Gather End User Device Settings**

**Part 2: Gather Information about Network Devices**

**Part 3: Diagnose Connectivity Issues**

## Background / Scenario

In this Packet Tracer (PT) activity, you will use various commands to gather device information and troubleshoot device configuration and connectivity issues. Device information includes IP address, default gateway, and DNS server settings. These settings are critical to enable a device to communicate on networks and connect to the internet.

## Instructions

### Part 1: Gather End User Device Settings

In this part, you will document the IP address settings for end devices.

#### Step 1: Document the IP address settings for HQ-Laptop-1.

a. The activity opens in the **HQ** cluster. The **Wiring Closet** is the tall, black chassis in the bottom left corner of the first floor. Locate all the devices on the first floor: PCs **1-1**, **1-2**, **1-3**, and **1-4**; printer **FL-1P**; and **HQ-Laptop-1**.

b. Click **HQ-Laptop-1** > **Desktop** tab > **Command Prompt**.

c. Enter the **ipconfig** command.
Which IPv4 address is displayed for the **Wireless0 Connection**?

Answer: Alamat tersebut mungkin muncul sebagai 169.254.0.0/16 karena koneksi nirkabel mungkin belum berhasil terhubung. Setelah koneksi berhasil, alamat tersebut akan berada dalam jaringan 192.168.50.0/24.

If the IPv4 address is in the 169.254.0.0/16 range, what method is being used to assign IPv4 addresses? Why is the laptop assigned an IPv4 address in the 169.254.0.0/16 range?

Answer: Perangkat gagal mendapatkan alamat dari server DHCP. Sebagai hasilnya, perangkat secara otomatis menetapkan alamat 169.254.0.0/16, yang digunakan untuk pengalamatan IP pribadi otomatis (APIPA).

If the IPv4 address is in the 169.254.0.0/16, wait a few seconds and repeat the **ipconfig** command.

When the IPv4 address is no longer from 169.254.0.0/16 range, what is the IP addressing information displayed? Record your answers in the table below.

| Wireless0 | IP Addressing Information |
|---|---|
| Link-local IPv6 Address | FE80::20A:F3FF:FEE4:EEAA |
| IPv6 Address | :: |
| IPv4 Address | 192.168.50.2 |
| **Wireless0** | **IP Addressing Information** |
| Subnet Mask | 192.168.50.2 |
| Default Gateway | 192.168.50.2 |
| DNS Servers | Tidak tersedia |

Do you see a DNS server address? Explain.

Answer : Perintah ipconfig tidak menampilkan alamat server DNS.

d. Enter the **ipconfig /all** command.
Do you see the DNS server address? What is it?

Answer : **10.2.0.125**

### Step 2: Document the IP address settings for Net-Admin.

a. Click **Wiring Closet** > **Net-Admin** > **Desktop** tab > **Command Prompt**.

b. Enter the **ipconfig /all** command.
What is the IP addressing information displayed under the FastEthernet0 interface? Record your answers in the table below.

| FastEthernet0 | IP Addressing Information |
|---|---|
| Physical Address | 000A.F3E4.EEAA |
| Link-local IPv6 Address | FE80::20A:F3FF:FEE4:EEAA |
| IPv6 Address | :: |
| IPv4 Address | 192.168.50.2 |
| Subnet Mask | 255.255.255.0 |
| Default Gateway | 192.168.50.1 |
| DNS Servers | 10.2.0.125 |

## Part 2: Gather Information about Network Devices

In this part, you will document information about the link to ISP. You will then document the IP addressing information for all the end devices in HQ and discover that devices belong to different virtual local area networks (VLANs).

### Step 1: Gather network connection information about the link between HQ and ISP.

The **HQ-Edge** router is the router between the HQ network and the ISP. We need to identify the upstream device information located in the ISP.

a. In the **Wiring Closet** left rack, click **HQ-Edge** > **CLI** tab.

b. Press **Enter** to get the **HQ-Edge>** prompt, and then enter the **enable** command.

c. Enter the **show ip route | begin Gateway** command.
What is the address for the gateway of last resort (or default gateway)?

Answer: **0.0.0.0**

Why is the next hop address not displayed?

Answer: tidak dikonfigurasi secara eksplisit

d. Enter the **show running-config | begin ip route** command.
How is the default route configured? Does it use the next hop address?

Answer: **route ikonfigurasikan dengan antarmuka keluar, bukan alamat hop berikutnya**

e. Enter the **show cdp neighbors detail** command.
What is the IPv4 address of the next hop (ISP) address?

Answer: **10.0.0.49**

Which port on the ISP router is connected to **HQ-Edge**?

Answer: **GigabitEthernet 1/0**

What IOS version is used on the ISP router?

Answer: **IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)** f.

Enter the **ping 10.0.0.49** command.

g. Enter the **show arp** command.
What is the MAC address of the interface on the **ISP** router that is connected to **HQ-Edge**?

Answer: **0060.2FE1.903B**

h. Close **HQ-Edge** and exit the **Wiring Closet**.

### Step 2: Gather network connection information about the devices in HQ.

a. From **1-1**, **1-2**, **1-3**, **1-4**, **FL-1P**, and **HQ-Laptop-1**, use the **ipconfig** command to find their IPv4 addresses and Default Gateways.

| Device | IPv4 Address | Default Gateway |
|---|---|---|
| 1-1 | 192.168.10.2 | 192.168.10.1 |
| 1-2 | 192.168.10.3 | 192.168.10.1 |
| 1-3 | 192.168.20.2 | 192.168.20.1 |

| | | |
|---|---|---|
| 1-4 | 192.168.20.3 | 192.168.20.1 |
| FL-1P | 192.168.50.2 | 192.168.50.1 |
| HQ-Laptop-1 | 192.168.50.3 | 192.168.50.1 |

b. From PC **1-1**, open **Command Prompt**, and then enter the **arp -a** command.
What information is displayed?

Answer: **Tidak ada ARP yang ditemukan**

c. Use the **ping** command to ping **1-2**, **1-3**, **1-4**, **FL-1P**, and **HQ-Laptop-1**.

d. Enter the **arp -a** command.
What information is displayed?

Answer:

```
  Internet Address      Physical Address      Type
  192.168.10.1          000a.41ea.6b47        dynamic
  192.168.10.3          0002.4a8a.d20e        dynamic
```

Why do the entries in the ARP table not contain information about devices in the 192.168.20.0 and 192.168.50.0 networks while the ping is successful?

Answer: **192.168.10.0/24, 192.168.20.0/24, dan 192.168.50.0/24 berada pada VLAN yang berbeda. Ping dari 192.168.10.0 ke jaringan VLAN lain harus melalui gateway default terlebih dahulu. Oleh karena itu, tabel ARP hanya berisi informasi tentang perangkat dalam jaringan yang sama atau VLAN yang sama.**

e. To find the route a packet takes to reach the DNS server, enter the tracert 10.2.0.125 command.

What information is displayed?

Answer:

```
Tracing route to 10.2.0.125 over a maximum of 30 hops:

1    0 ms      2 ms      0 ms      192.168.10.1
2    12 ms     0 ms      0 ms      10.0.0.49
3    1 ms      0 ms      0 ms      10.2.0.125
```

How many routers, or hops, are between PC 1-1 and the DNS server?

Answer: **2**

## Part 3: Diagnose Connectivity Issues

In this part, you will use a variety of diagnostic commands and techniques. You will use the **nslookup** command to query a DNS server and troubleshoot a DNS database. You will then diagnose why a ping fails but web access is successful. Finally, you will use the **netstat** command to discover which ports are listening on the target device.

### Step 1: Test a URL to investigate a connectivity issue.

a. On PC **1-1**, close the **Command Prompt**, and then click **Web Browser.**

b. Enter the URL **test.ptsecurity.com**.
Does the web page display? If not, what is the message?

Answer: **tidak. Pesan yang muncul adalah “Nama Host Tidak Terselesaikan”.**

c. Enter the IP address **192.168.75.2**.
Does the web page display?

Answer: **Ya ditampilkan**

Why does the web page display by using the IP address but not the domain name?

Answer: **PC tidak dapat menentukan nama domain ke alamat IP.**

### Step 2: Use the nslookup command to verify DNS service.

a. Close **Web Browser**, and then click **Command Prompt**.

b. Enter the **ping test.ptsecurity.com** command.
What message is displayed?

Answer: **Ping request could not find host test.ptsecurity.com. Please check the name and try again.**

What does the message indicate?

Answer: **Entri DNS tidak ada dalam basis data server DNS.**

c. Enter the **nslookup test.ptsecurity.com** command.
What message is displayed?

Answer:

```
Server  : [10.2.0.125]
Address:  10.2.0.125

*** UnKnown can't find test.ptsecurity.com: Non-existent
domain.
```

Which server is the default DNS server?

Answer: **10.2.0.125**

d. The **nslookup** command supports the use of alternate DNS server. Enter the **nslookup /?** command to learn options available for the command.

e. Enter the **nslookup test.ptsecurity.com 192.168.99.3** command and press **Enter**.

**Note**: Packet Tracer may take several seconds to converge.
What message is displayed?

Answer:

```
C:\> nslookup test.ptsecurity.com 192.168.99.3

Server: [192.168.99.3]
Address:  192.168.99.3

Non-authoritative answer:
Name:   test.ptsecurity.com
Address:   192.168.75.2
```

In Step 2c, why is the domain name unable to be resolved?

Answer: **Saat nama domain dimasukkan dalam kotak URL, PC akan mencoba menyelesaikannya melalui Server DNS default. Dalam kasus ini, server DNS default tidak memiliki informasi di dalam basis datanya.**

### Step 3: Use output from the ping command to diagnose connectivity issues.

a. Enter the **ping mail.cybercloud.com** command.

What message is displayed?

Answer:

```
C:\> ping mail.cybercloud.com Pinging
172.19.0.4 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 172.19.0.4: Packets: Sent = 4,
Received = 0, Lost = 4 (100% loss),
```

What information is indicated by the message?

Answer: **Konfigurasi nama DNS berhasil. Namun, ping gagal. Kemungkinan penyebabnya adalah host tidak aktif atau gema/balas gema ICMP dinonaktifkan pada host.**

b. Enter the **ping www.ptsecurity.com** command.
What message is displayed?

Answer:

```
Pinging 10.0.0.3 with 32 bytes of data:

Request timed out.
Request timed out.
Reply from 10.0.0.3: Destination host unreachable.
Reply from 10.0.0.3: Destination host unreachable.

Ping statistics for 10.0.0.3:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

What information is indicated by the message?

Answer: **Ada firewall di jalur yang memblokir ping ke tujuan.**

c. Close the **Command Prompt**, open **Web Browser**, and then navigate to **www.ptsecurity.com**.
Does the web page display?

Abwer: **Ya**

What conclusion can be drawn?

Answer: **Host web berjalan, namun ping ke server web diblokir.**

### Step 4: Use the netstat command to find active and listening ports.

a. Close **Web Browser**, and reopen **Command Prompt**.

b. In **HQ**, click the **Wiring Closet**

c. From the right rack, click the **FTP** server > **Desktop** tab > **Command Prompt**.

d. Arrange the PC **1-1** and FTP server **Command Prompt** windows side by side.

e. From the PC **1-1** window, enter the **netstat** command.
What message is displayed? Does it show any data?

Answer:

```
C:\>netstat
Active Connections
```

```
  Proto  Local Address          Foreign Address        State
```

f. From the **FTP** server, enter the **netstat** command.
What message is displayed? Does it show any data?

Answer:

```
C:\>netstat

Active Connections

  Proto  Local Address          Foreign Address              State
  TCP    0.0.0.0:25             0.0.0.0:0                   CLOSED
  TCP    0.0.0.0:110            0.0.0.0:0                   CLOSED
TCP    0.0.0.0:8443           0.0.0.0:0                   CLOSED
C:\>
```

**It shows no active connection to other devices and no listening ports.**

g. On **FTP** server, enter the **ipconfig** command to determine its IP address.

h. From **PC 1-1**, start an FTP session with the FTP server.

i. On the **FTP** server, enter the **netstat** command.
What message is displayed? Is there any new information?

Answer: **Ya, masuknya entri baru menunjukkan TCP 192.168.75.2:21 192.168.10.3:1025 DIBENTUK.**

Which port is the listening port and what is the status of the connection?

Answer: **Port listening adalah TCP 21 dan koneksi TCP dibuat.**

j. From PC **1-1**, enter **bob** as the username.

k. From the **FTP** server, enter the **netstat** command.
Does the displayed information change?

Answer: **Tidak**

l. From **PC 1-1**, enter **cisco123** as the password.

m. From **PC 1-1**, enter the **dir** command.

n. From the **FTP** server, enter the **netstat** command.
Does the displayed information change?

Answer: **Ya. Entri baru menunjukkan TCP 192.168.75.2:1028 192.168.10.3:1028 DITUTUP.**

What is indicated by this new entry?

Answer: **Sambungan TCP baru dibuka untuk mentransfer nama file dalam direktori FTP dan sambungan ditutup setelah operasi selesai.**

o. From **PC 1-1**, enter the **put Sample2.txt** command and press **Enter**. This will upload the Sample2.txt file to the **FTP** server.

p. From the **FTP** server, enter the **netstat** command.
Does the displayed information change?

Answer: **Ya. Entri baru menunjukkan: TCP 192.168.75.2:1030 192.168.10.3:1029 CLOSING.**

q. Wait for a few seconds and then enter the **netstat** command again.
Does the displayed information change?

Answer: **Ya, baris “CLOSED” sudah tidak ada.**

r. From **PC 1-1**, enter the **quit** command.

s. From the **FTP** server, enter the **netstat** command.
Does the displayed information change?

Answer: **Ya. Sekarang sambungan TCP antara 192.168.75.2:21 dan 192.168.10.2:1027 telah TERTUTUP.**

From **PC 1-1**, close **Command Prompt**, and then open **Web Browser**.

t. Navigate to **192.168.75.2**.

u. From the **FTP** server, enter the **netstat** command.
Does the displayed information change?

Answer: **Ya. Entri baru menunjukkan TCP 192.168.75.2:80 192.168.10.2:1030 CLOSED.**

What does this new entry indicate?

Answer: **Permintaan halaman web dibuat oleh host 192.168.10.2. Halaman web dikirim (ditampilkan pada browser web PC 1-1) dan sambungan TCP ditutup Permintaan halaman web dilakukan oleh host 192.168.10.2. Halaman web dikirimkan (ditampilkan pada browser web PC 1-1) dan koneksi TCP ditutup.**

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