

**Lembar Jawaban**  
**Assignment – A01**

# **Introduction to Google Cloud Platform, Packet Tracer, Networking Tools, and Go Programming Language**

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## A01a – Introduction to Google Cloud Platform

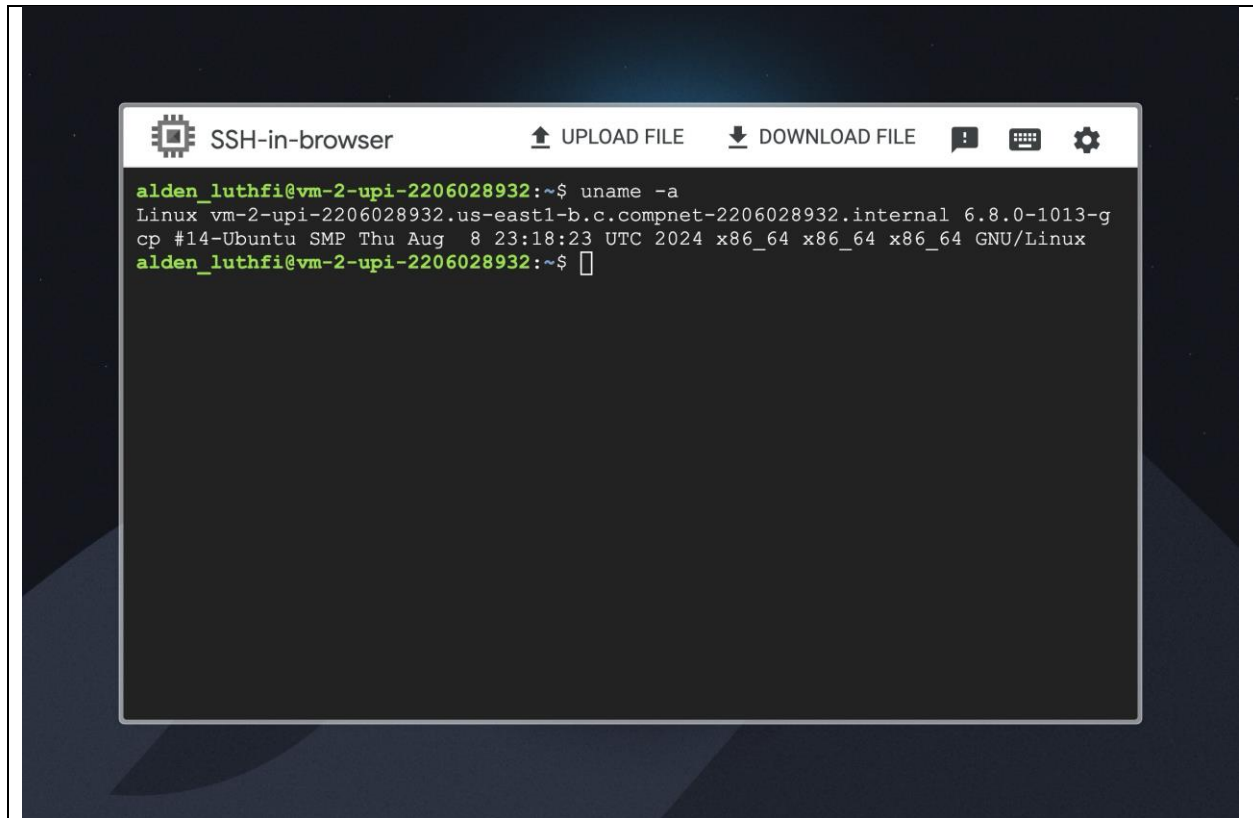
### Bukti Koneksi SSH

Tangkapan Layar VM1



```
aldenluthfi@vm-1-upi-2206028932: ~  
aldenluthfi@vm-1-upi-2206028932:~$ uname -a  
Linux vm-1-upi-2206028932.us-central1-a.c.comput-2206028932.internal 6.8.0-1013-gcp #14-Ubuntu SMP Thu Aug 8 23:18:23 UTC 2024 x86_64 x86_64 x86_64 GNU/Linux  
aldenluthfi@vm-1-upi-2206028932:~$
```

Tangkapan Layar VM2



## Pemasangan Aplikasi

Tangkapan Layar VM1

```
aldenluthfi@vm-1-upi-2206028932:~$ which lynx
/usr/bin/lynx
aldenluthfi@vm-1-upi-2206028932:~$
```

## Tangkapan Layar VM2

SSH-in-browser

UPLOAD FILE

DOWNLOAD FILE

```
alden_luthfi@vm-2-upi-2206028932:~$ which lynx
/usr/bin/lynx
alden_luthfi@vm-2-upi-2206028932:~$
```

### **Bukti Pembuatan Aturan Firewall**

Kalian tidak perlu mencantumkan apa pun di laporan untuk bagian ini. Kalian cukup mengumpulkan berkas yang diminta sesuai spesifikasi.

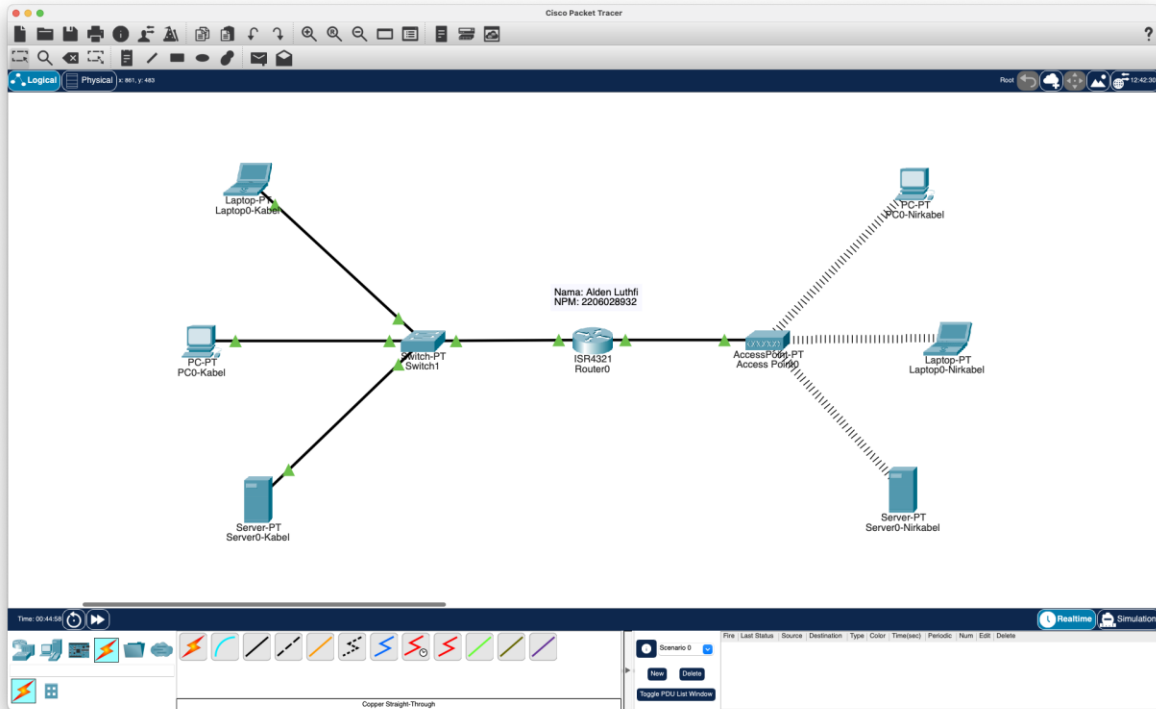
### **Bukti Pembuatan VM**

Kalian tidak perlu mencantumkan apa pun di laporan untuk bagian ini. Kalian cukup mengumpulkan berkas yang diminta sesuai spesifikasi.

## A01b - Introduction to Packet Tracer

### 1. [10] Topologi

#### Tangkapan Layar Topologi



### 2. [40] Konfigurasi Perangkat

Laptop0-Kabel

PC1-Kabel

**Laptop0-Kabel**

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.0.2

Subnet Mask 255.255.255.0

Default Gateway 192.168.0.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address

Link Local Address FE80:260:3EFF:FE24:40E4

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

☐ Top

**PC0-Kabel**

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.0.3

Subnet Mask 255.255.255.0

Default Gateway 192.168.0.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address

Link Local Address FE80:202:16FF:FEC3:E072

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

☐ Top

**Server0-Kabel**

**Laptop0-Nirkabel**

**Server0-Kabel**

Physical Config **Services** Desktop Programming Attributes

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.0.4

Subnet Mask 255.255.255.0

Default Gateway 192.168.0.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address

Link Local Address FE80:20B:8EFF:FE20:409E

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

☐ Top

**Laptop0-Nirkabel**

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface Wireless0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.3

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

IPv6 Configuration

☒ Automatic ☐ Static

IPv6 Address

Link Local Address FE80:290:CFF:F5A4:C26D

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

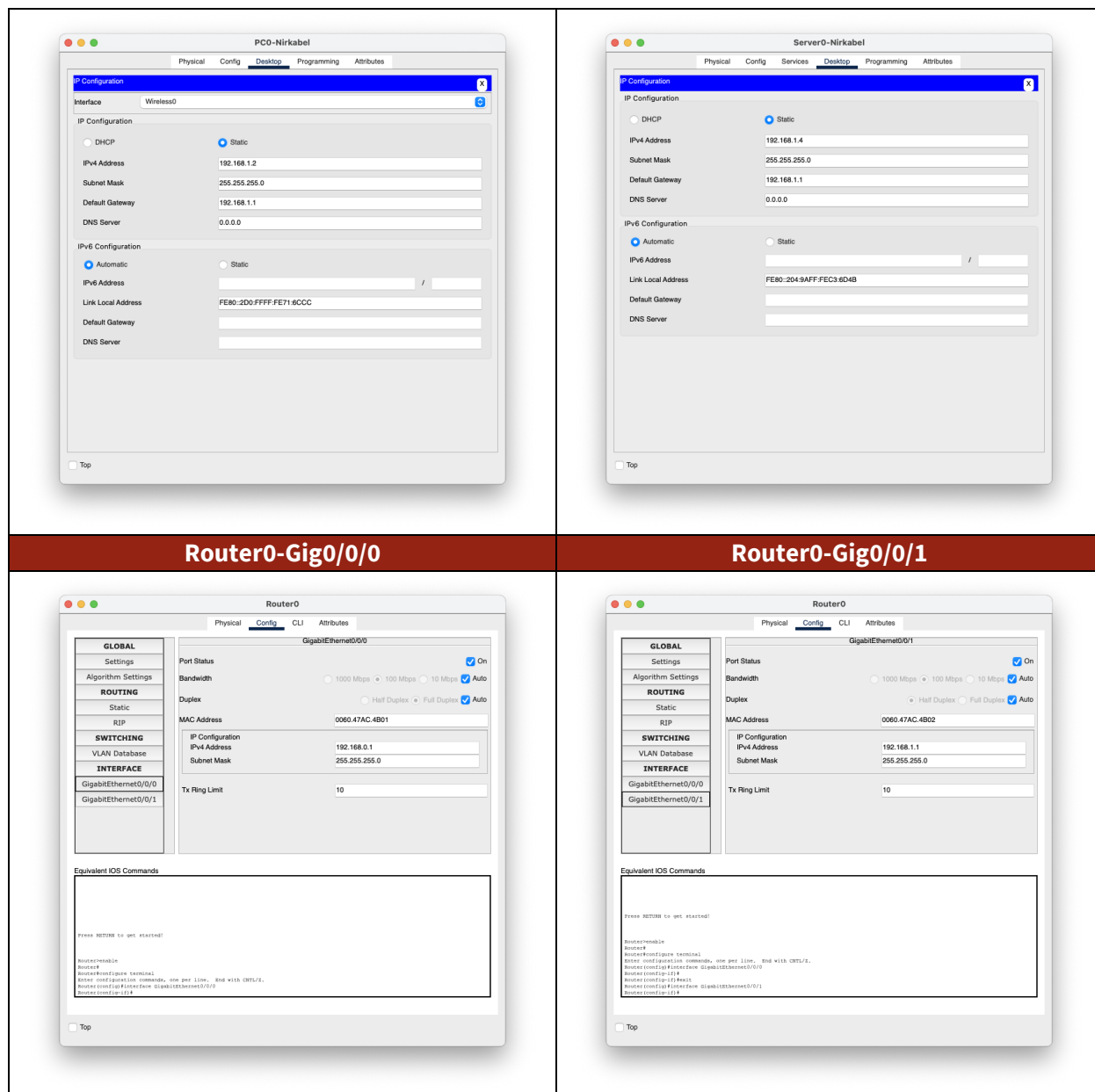
Username

Password

☐ Top

**PC1-Nirkabel**

**Server0-Nirkabel**



### 3. [30] Uji Konektivitas

<p><b>Command Prompt – PING</b></p> <p><b>a. Server0-Kabel ke Laptop0-Kabel</b></p>	<p><b>PDU Sederhana</b></p> <p><b>Hasil Seluruh (a-e) Uji Konektivitas</b></p>
---	--



```
Server0-Kabel
Physical Config Services Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer SERVER Command Line 1.0
C:\>ping 192.168.0.2

Pinging 192.168.0.2 with 32 bytes of data:

Reply from 192.168.0.2: bytes=32 time=2ms TTL=128
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0%
    loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>
```

## b. Laptop0-Kabel ke Router0

```
Laptop0-Kabel
Physical Config Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.1

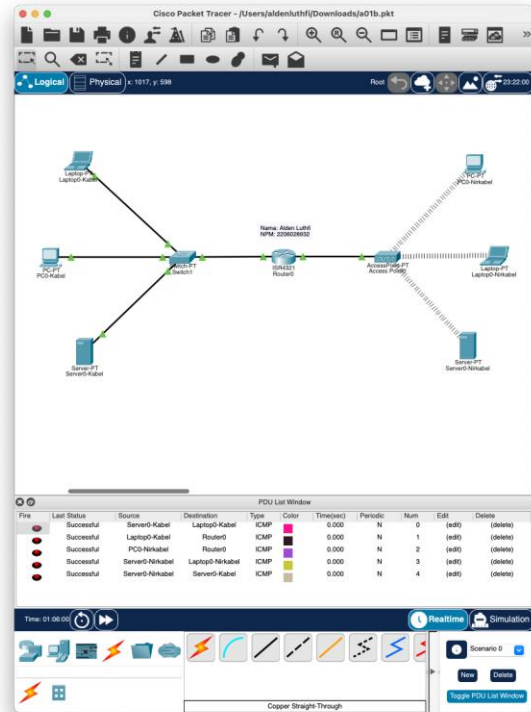
Pinging 192.168.0.1 with 32 bytes of data:

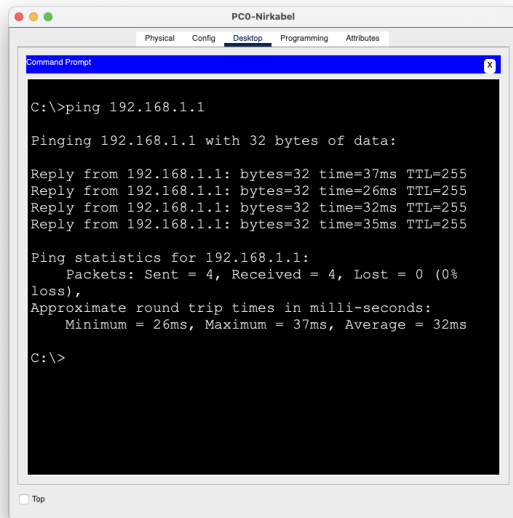
Reply from 192.168.0.1: bytes=32 time=2ms TTL=255
Reply from 192.168.0.1: bytes=32 time<1ms TTL=255
Reply from 192.168.0.1: bytes=32 time<1ms TTL=255
Reply from 192.168.0.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0%
    loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>
```

## c. PC0-Nirkable ke Router0





```
C:\>ping 192.168.1.1

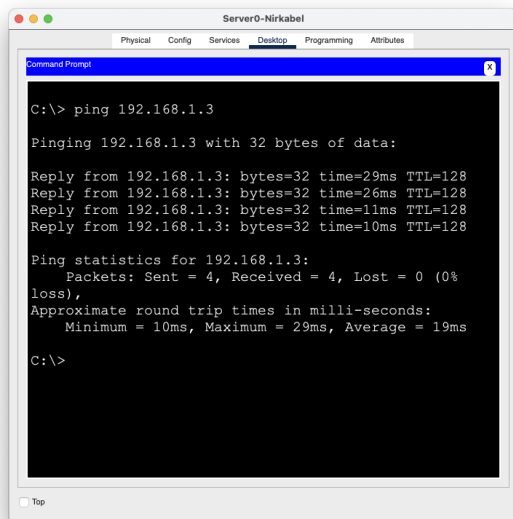
Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=37ms TTL=255
Reply from 192.168.1.1: bytes=32 time=26ms TTL=255
Reply from 192.168.1.1: bytes=32 time=32ms TTL=255
Reply from 192.168.1.1: bytes=32 time=35ms TTL=255

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0%
    loss),
    Approximate round trip times in milli-seconds:
        Minimum = 26ms, Maximum = 37ms, Average = 32ms

C:\>
```

#### d. Server0-Nirkabel ke Laptop0-Nirkabel



```
C:\> ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=29ms TTL=128
Reply from 192.168.1.3: bytes=32 time=26ms TTL=128
Reply from 192.168.1.3: bytes=32 time=11ms TTL=128
Reply from 192.168.1.3: bytes=32 time=10ms TTL=128

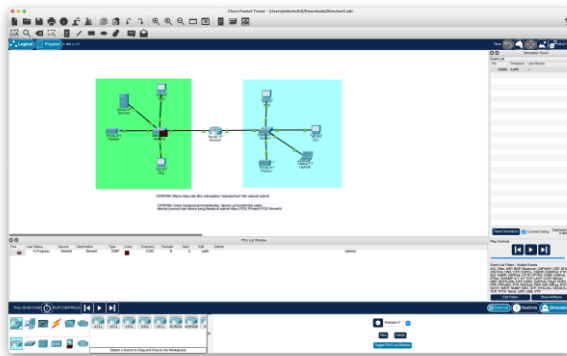
Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0%
    loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 29ms, Average = 19ms

C:\>
```

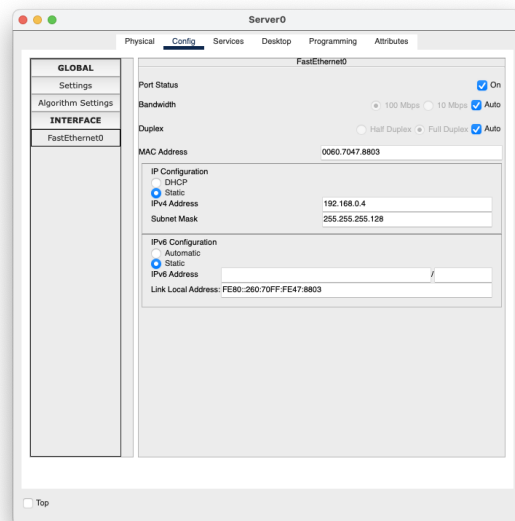
#### e. Server0-Nirkabel ke Server0-Kabel



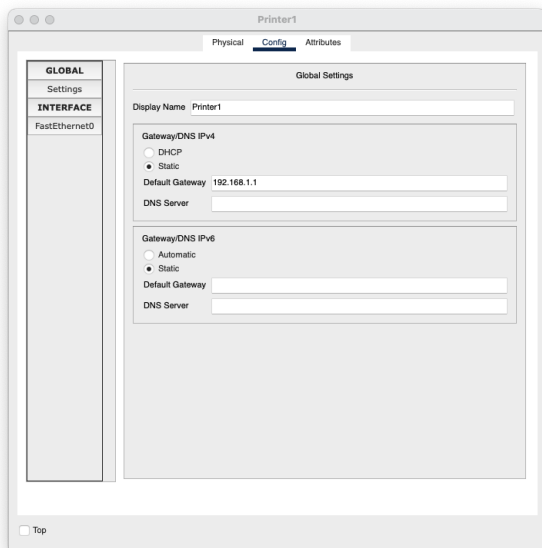
3.



4.



5.



Penjelasan step-by-step debugging dan saran perbaikan

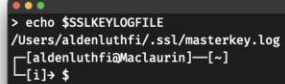
1. Hal pertama yang dapat diperhatikan adalah Server0 yang dalam keadaan off
2. [SARAN PERBAIKAN] Menyalakan server0 dari keadaan off menjadi on
3. Setelah menjalankan pengiriman PDU dari segala macam perangkat, terdeteksi masalah di Server0 dan Printer1. Server0 yang memiliki IPv4 address duplikat dan Printer1 yang tidak memiliki default gateway
4. [SARAN PERBAIKAN] Mengganti IPv4 address Server0 menjadi 192.168.0.5
5. [SARAN PERBAIKAN] Menganti default gateway Printer1 menjadi 192.168.1.1



## A01c – Introduction to Networking Tools

### [30] Packet Capture and Decrypt with Wireshark

#### Penambahan SSLKEYLOGFILE di Environment Variable

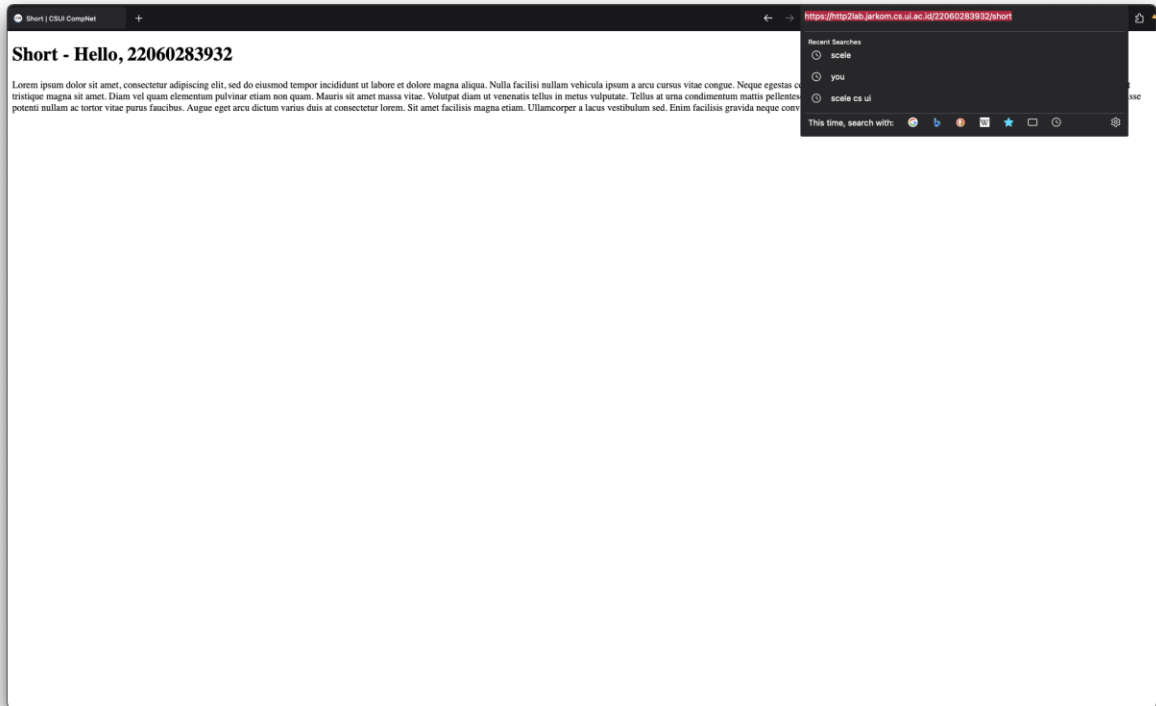
A terminal window with a dark background and light text. The title bar says "Terminal". The command prompt shows the user is at a Mac. The command being entered is to set the SSLKEYLOGFILE environment variable to a specific log file path.

```
> echo $SSLKEYLOGFILE
/Users/aldenluthfi/.ssl/masterkey.log
[aldenluthfi@MacLaurin]~$
```

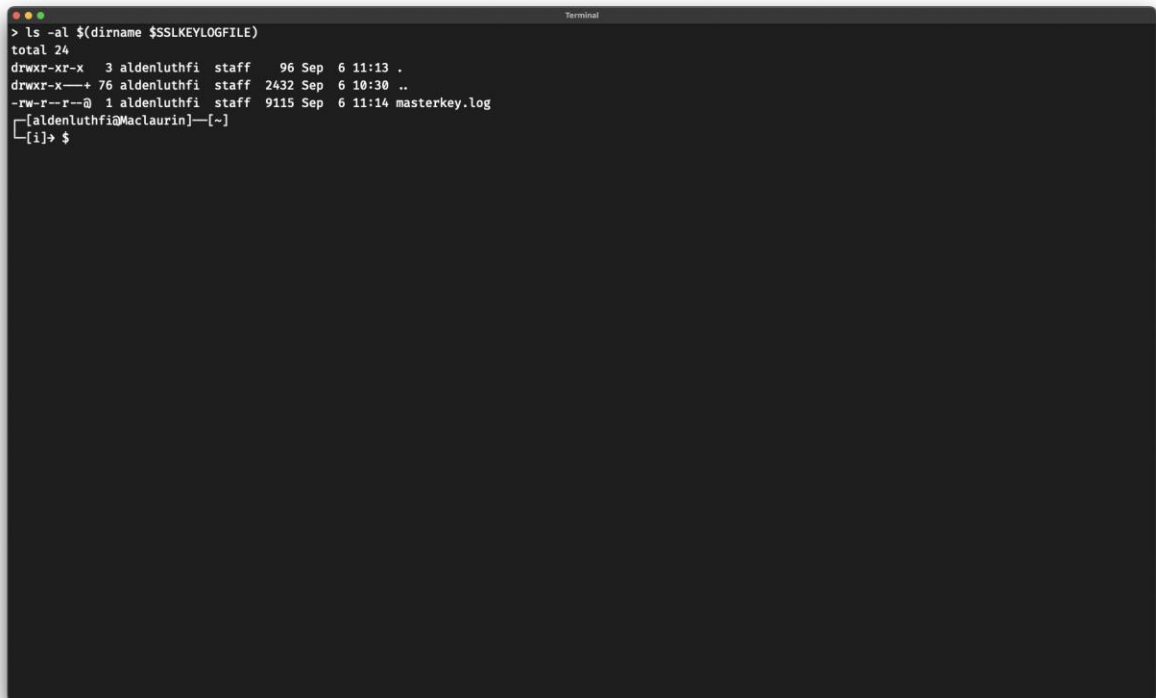
#### Direktori SSLKEYLOGFILE Sebelum Mengakses Website

```
Terminal
> ls -al $(dirname $SSLKEYLOGFILE)
total 0
drwxr-xr-x  2 aldenluthfi staff   64 Sep  6 11:07 .
drwxr-xr-x+76 aldenluthfi staff 2432 Sep  6 10:30 ..
[aldenluthfi@Maclaurin]~]
[i]~$
```

Mengakses Halaman *Website*

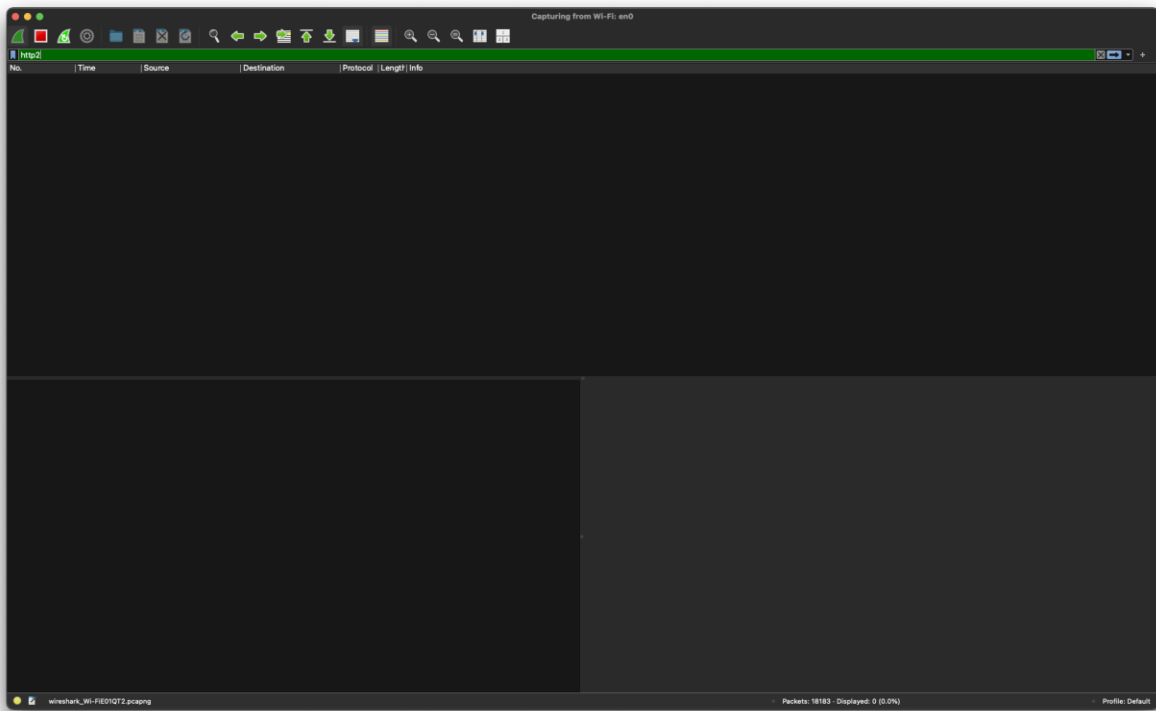


## Direktori SSLKEYLOGFILE Setelah Mengakses Website

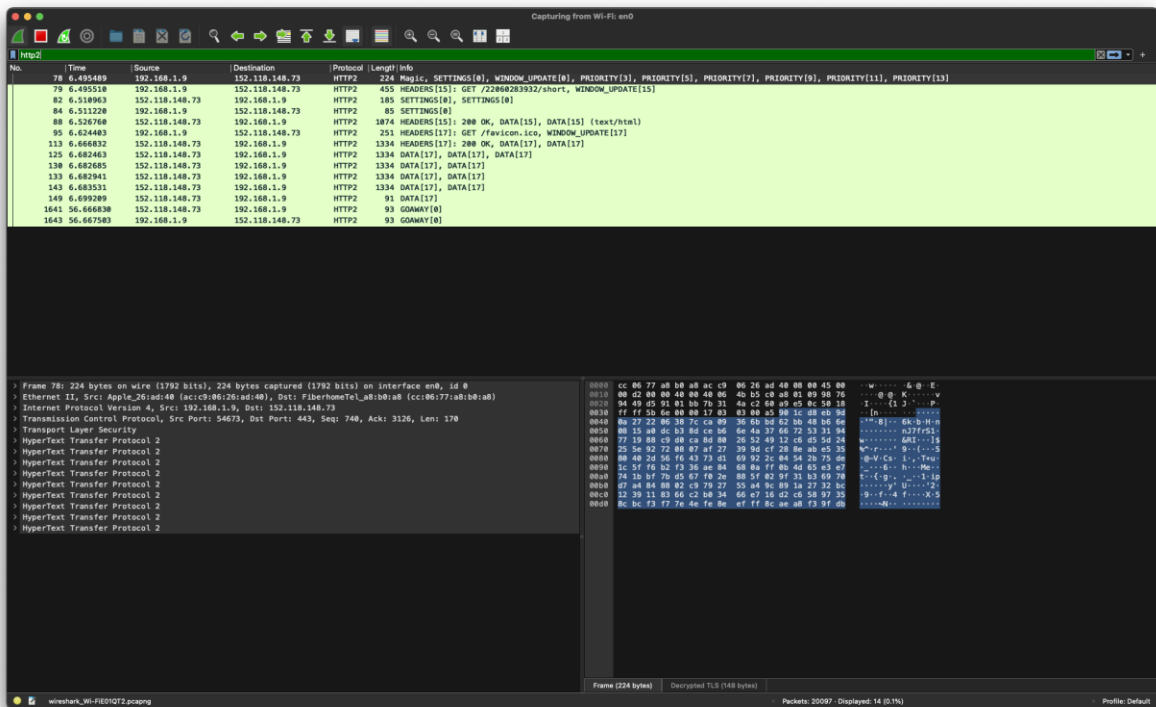




## Tangkapan Paket Sebelum Dilakukan Dekripsi



## Tangkapan Paket Setelah Dilakukan Dekripsi



## [40] Packet Capture with Tcpcdump and Analysis

Instance Primary Network Interface IP Address

```
aldenluthfi@vm-1-upi-2206028932:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: ens4: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 42:01:0a:80:00:03 brd ff:ff:ff:ff:ff:ff
    inet 10.128.0.3/32 metric 1024 scope global dynamic ens4
        valid_lft 2760sec preferred_lft 2760sec
    inet6 fe80::4001:aff:fe80:3/64 scope link
        valid_lft forever preferred_lft forever
aldenluthfi@vm-1-upi-2206028932:~$ ip r | grep default
default via 10.128.0.1 dev ens4 proto dhcp src 10.128.0.3 metric 1024
aldenluthfi@vm-1-upi-2206028932:~$
```

IP internal adalah: 10.128.0.3

```
alden@kali:~$ ssh user@192.168.1.100
Web Kuliah Teori Bahasa dan Automata
Fakultas Ilmu Komputer

Please Login
User ID:
password:

Reset OK
Lupa password?
akun baru?
Kuliah Lain
SQA/DDP
TBA Intern. Class
Resources
Petunjuk Umum (silakan Klik, ada isian essay untuk mencoba submit saja)
Regular Expression Utilities
Download site JFlap 7.1
Info Lain
** tidak ada **
-->

IFRAME: frame_detail

(Textfield "Xs") Enter text. Use UP or DOWN arrows or tab to move off.
Enter text into the field by typing on the keyboard
Ctrl-U to delete all text in field, [Backspace] to delete a character
```

## Tcpdump Command and Output After Aborting

```

aldenluthfi@vm-1-upi-2206028932:~$ nslookup aren.cs.ui.ac.id
Server:      127.0.0.53
Address:     127.0.0.53#53

Non-authoritative answer:
Name:   aren.cs.ui.ac.id
Address: 152.118.148.76

aldenluthfi@vm-1-upi-2206028932:~$ sudo tcpdump -i ens4 tcp port 80 and host 152.118.148.76 -w A01_2206028932_aren.pcapng
tcpdump: listening on ens4, link-type EN10MB (Ethernet), snapshot length 262144 bytes
^C21 packets captured
21 packets received by filter
0 packets dropped by kernel
aldenluthfi@vm-1-upi-2206028932:~$

```

## Screenshot of Capture Result in Wireshark

The screenshot displays the Wireshark interface with a packet capture of an HTTP GET request. The packet list shows a GET request for /liba HTTP/1.0. The packet details show the request structure, and the packet bytes show the raw data.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	152.118.0.3	152.118.148.76	TCP	66	80 → 33280 [SYN, ACK] Seq=0 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
2	0.225816	152.118.148.76	10.128.0.3	TCP	66	80 → 33280 [SYN, ACK] Seq=0 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
3	0.225889	10.128.0.3	152.118.148.76	TCP	54	33280 → 80 [ACK] Seq=1 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
4	0.225752	10.128.0.3	152.118.148.76	HTTP	289	GET /liba HTTP/1.0
5	0.448658	152.118.148.76	10.128.0.3	TCP	54	80 → 33280 [ACK] Seq=1 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
6	0.448288	152.118.148.76	10.128.0.3	HTTP	575	HTTP/1.1 301 Moved Permanently (text/html)
7	0.448288	152.118.148.76	10.128.0.3	TCP	54	80 → 33280 [FIN, ACK] Seq=522 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
8	0.448258	10.128.0.3	152.118.148.76	TCP	54	33280 → 80 [ACK] Seq=236 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
9	0.449182	10.128.0.3	152.118.148.76	TCP	54	33280 → 80 [FIN, ACK] Seq=236 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
10	0.469858	152.118.148.76	10.128.0.3	TCP	54	80 → 33280 [ACK] Seq=523 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
11	2.453362	10.128.0.3	152.118.148.76	TCP	74	39642 → 80 [SYN] Seq=0 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
12	2.673588	152.118.148.76	10.128.0.3	TCP	66	80 → 39642 [SYN, ACK] Seq=0 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
13	2.673641	10.128.0.3	152.118.148.76	TCP	54	39642 → 80 [ACK] Seq=1 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
14	2.674109	10.128.0.3	152.118.148.76	HTTP	298	GET /liba HTTP/1.0
15	2.895555	152.118.148.76	10.128.0.3	TCP	54	80 → 39642 [ACK] Seq=1 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
16	2.988371	152.118.148.76	10.128.0.3	HTTP	2488	HTTP/1.1 200 OK (text/html)
17	3.988371	152.118.148.76	10.128.0.3	TCP	54	80 → 39642 [FIN, ACK] Seq=2435 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
18	2.988445	10.128.0.3	152.118.148.76	TCP	54	39642 → 80 [ACK] Seq=237 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
19	2.941238	10.128.0.3	152.118.148.76	TCP	54	39642 → 80 [ACK] Seq=237 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
20	4.638896	10.128.0.3	152.118.148.76	TCP	54	39642 → 80 [FIN, ACK] Seq=237 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128
21	8.861963	152.118.148.76	10.128.0.3	TCP	54	80 → 39642 [ACK] Seq=2436 Win=0 Len=0 MSS=1460 SACK_PERM TSval=1238488163 TSecr=0 WS=128

Frame 1: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface 0  
 Ethernet II, Src: 42:01:00:00:00:00 (42:01:00:00:00:00), Dst: 42:01:00:00:00:01 (42:01:00:00:00:01)  
 Internet Protocol Version 4, Src: 10.128.0.3, Dst: 152.118.148.76  
 Transmission Control Protocol, Src Port: 33280, Dst Port: 80, Seq: 0, Len: 0

### Packet Analysis

1. (TCP SYN): (SYN = synchronize) Paket ini menandakan permulaan koneksi TCP dari *client* ke *server*
2. (TCP SYN, ACK): (ACK = Acknowledge), server sudah menyadari koneksi dari *client*
3. (TCP ACK): tanda bahwa koneksi sudah berhasil
4. (HTTP GET): *request* GET untuk meminta *resource* dari server
5. (TCP ACK): *Server* menyadari permintaan GET dari *client*.
6. (HTTP 301 Moved Permanently): Server mengalihkan *client* ke lokasi *resource* yang baru.
7. (TCP FIN, ACK): (FIN = finish) *client* memulai penutupan koneksi.
8. (TCP ACK): *Server* menyadari permintaan penutupan koneksi.
9. (TCP FIN, ACK): *Server* mulai menutup koneksi.
10. (TCP ACK): Koneksi TCP ditutup.
11. (TCP SYN): *Client* memulai koneksi TCP.
12. (TCP SYN, ACK): *Server* menyadari permintaan koneksi baru.
13. (TCP ACK): Koneksi TCP baru berhasil.
14. (HTTP GET): *request* GET untuk meminta *resource* dari server
15. (TCP ACK): *Server* menyadari permintaan GET dari *client*.
16. (HTTP 200 OK): Respon sukses dari *server*.
17. (TCP ACK): Klien menyadari penerimaan data HTTP.
18. (TCP FIN, ACK): Klien memulai penutupan koneksi.
19. (TCP ACK): *Server* menyadari permintaan penutupan koneksi.
20. (TCP FIN, ACK): *Server* mulai menutup koneksi.
21. (TCP ACK): Koneksi ditutup.

## [30] Network Diagnostics

### ARP

#### Screenshot Command dan Output-nya

```
aldenluthfi@vm-1-upi-2206028932:~$ arp -av
_gateway (10.128.0.1) at 42:01:0a:80:00:01 [ether] on ens4
Entries: 1    Skipped: 0    Found: 1
aldenluthfi@vm-1-upi-2206028932:~$
```

```
aldenluthfi@vm-2-upi-2206028932:~$ arp -av
_gateway (10.142.0.1) at 42:01:0a:80:00:01 [ether] on ens4
Entries: 1    Skipped: 0    Found: 1
aldenluthfi@vm-2-upi-2206028932:~$
```

### Penjelasan

Pada kedua VM, hanya terdapat satu entri pada masing-masing tabel ARP, tertulis juga default gateway pada VM1 yaitu 10.128.0.1 dan VM2 yaitu 10.142.0.1. kedua perangkat memakai interface jaringan ens4 dan MAC adress yang sama yaitu 42:01:0a:80:00:01

## DiG

### Screenshot Command dan Output-nya

```
aldenluthfi@vm-1-upi-2206028932:~$ dig youtube.com

; <<>> DiG 9.18.28-0ubuntu0.24.04.1-Ubuntu <<>> youtube.com
;; global options: +cmd
;; Got answer:
;; -->HEADER<-- opcode: QUERY, status: NOERROR, id: 18091
;; flags: qr rd ra; QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;youtube.com.                IN      A

;; ANSWER SECTION:
youtube.com.                 300     IN      A       209.85.200.91
youtube.com.                 300     IN      A       209.85.200.136
youtube.com.                 300     IN      A       209.85.200.190
youtube.com.                 300     IN      A       209.85.200.93

;; Query time: 3 msec
;; SERVER: 127.0.0.53#53(127.0.0.53) (UDP)
;; WHEN: Fri Sep 06 04:26:47 UTC 2024
;; MSG SIZE rcvd: 104

aldenluthfi@vm-1-upi-2206028932:~$
```

### Penjelasan

Perintah dig (Domain Information Groper) digunakan untuk mencari informasi DNS dan memberikan rincian mengenai alamat IP yang berhubungan dengan nama domain tertentu. Dalam hasil yang ditampilkan, perintah ini mengajukan permintaan ke server DNS lokal (yang ditunjukkan oleh alamat 127.0.0.53) untuk menemukan alamat IP yang terhubung dengan domain youtube.com.

Terdapat 4 IP address yang terikat pada domain youtube.com, 74.125.69.190, 74.125.69.91, 74.125.69.136, dan 74.125.69.93. Angka 300 menandakan jumlah nanodetik yang dibutuhkan untuk query. Command juga mengeluarkan pesan sukses.

## Ping

### Screenshot Command dan Output-nya



```
aldenluthfi@vm-1-upi-2206028932:~$ ping -c 4 google.com
PING google.com (74.125.126.102) 56(84) bytes of data:
64 bytes from ik-in-f102.1e100.net (74.125.126.102): icmp_seq=1 ttl=115 time=3.77 ms
64 bytes from ik-in-f102.1e100.net (74.125.126.102): icmp_seq=2 ttl=115 time=1.48 ms
64 bytes from ik-in-f102.1e100.net (74.125.126.102): icmp_seq=3 ttl=115 time=1.51 ms
64 bytes from ik-in-f102.1e100.net (74.125.126.102): icmp_seq=4 ttl=115 time=1.32 ms

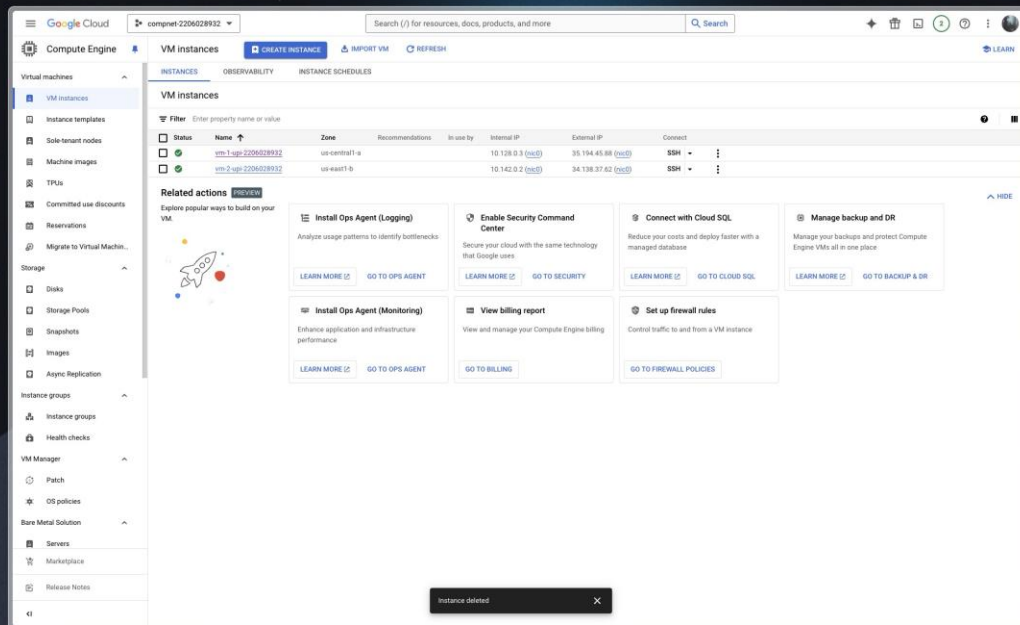
--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 1.319/2.019/3.771/1.014 ms
aldenluthfi@vm-1-upi-2206028932:~$
```

### Penjelasan

Flag `-c` digunakan untuk mengeluarkan tepat 4 paket. Dari luaran diatas, bisa dilihat perintah ping ke google.com berhasil mengirim 4 paket. Ini adalah salah satu tanda jaringan instance lancar tanpa ada kehilangan paket 0% packet loss serta RTT untuk empat ping yang dilakukan berkisar antara sekitar 1,13 ms hingga 3,01 ms.

## Traceroute

### Screenshot Command dan Output-nya



```
aldenluthfi@vm-1-upi-2206028932:~$ traceroute 10.142.0.2
traceroute to 10.142.0.2 (10.142.0.2), 30 hops max, 60 byte packets
 1 vm-2-upi-2206028932.us-east1-b.c.compet-2206028932.internal (10.142.0.2) 34.563 ms * 34.712 ms
aldenluthfi@vm-1-upi-2206028932:~$
```

Penjelasan

Karena jumlah hop yang dilakukan oleh VM1 ke VM2 menunjukkan bahwa kedua VM berada pada lokasi yang berdekatan di arsitektur cloud.

## Netstat/ss

### Screenshot Command dan Output-nya

```
aldenluthfi@vm-1-upi-2206028932:~$ ss -aetu
Netid State Recv-Q Send-Q Local Address:Port Peer Address:Port Process
udp UNCONN 0 0 127.0.0.54:domain 0.0.0.0:* uid:991 ino:5302 sk:1 cgroup:/system.slice/systemd-resolved.service ↔
udp UNCONN 0 0 127.0.0.53%lo:domain 0.0.0.0:* uid:991 ino:5300 sk:2 cgroup:/system.slice/systemd-resolved.service ↔
udp UNCONN 0 0 10.128.0.3%ens4:bootpc 0.0.0.0:* uid:998 ino:7773 sk:3 cgroup:/system.slice/systemd-networkd.service ↔
udp UNCONN 0 0 127.0.0.1:323 0.0.0.0:* ino:7225 sk:4 cgroup:/system.slice/chrony.service ↔
udp UNCONN 0 0 [::1]:323 [::]:* ino:7226 sk:5 cgroup:/system.slice/chrony.service v6only:1 ↔
tcp LISTEN 0 4096 127.0.0.54:domain 0.0.0.0:* uid:991 ino:4238 sk:6 cgroup:/system.slice/systemd-resolved.service ↔
tcp LISTEN 0 4096 127.0.0.53%lo:domain 0.0.0.0:* uid:991 ino:5301 sk:7 cgroup:/system.slice/systemd-resolved.service ↔
tcp ESTAB 0 0 10.128.0.3:49058 169.254.169.254:http timer:(keepalive,2.357ms,0) ino:4903 sk:9 cgroup:/system.slice/google-osconfig-agent.service ↔
tcp ESTAB 0 0 10.128.0.3:53906 169.254.169.254:http timer:(keepalive,10sec,0) ino:6691 sk:a cgroup:/system.slice/google-guest-agent.service ↔
tcp LISTEN 0 4096 *:ssh *:* ino:5763 sk:b cgroup:/system.slice/ssh.socket v6only:b ↔
tcp ESTAB 0 376 [::ffff:10.128.0.3]:ssh [::ffff:110.138.95.23]:54805 timer:(on,430ms,0) ino:8095 sk:c cgroup:/system.slice/ssh.socket ↔
aldenluthfi@vm-1-upi-2206028932:~$
```

### Penjelasan

Perintah ini menunjukan jaringan yang aktif di sistem. Kolom state menunjukkan status koneksi socket seperti UNCONNECTED, LISTEN dan ESTABLISHED, kolom recv-Q menunjukan jumlah bytes yang diterima, kolom send-Q menunjukan jumlah bytes yang dikirim, tertulis juga kolom address lokal serta port yang digunakan dan address rekan dan port yang digunakan.

## A01d – Introduction to Go Programming Language

### [5] Testcase 1

#### Tangkapan Layar Luaran Testcase 1

```

> go run .
Name: Alden Luthfi, ID Student: 2206028932
=====
Welcome to Sigmart Point of Sales
Please input your command below
=====
ADD_ITEM MK201 MASKER 12500 20
[SUCCESS] successfully added item MK201 to list of items
ADD_MEMBER MM001 JOJO
[SUCCESS] successfully added member MM001 to list of members
ADD_TRANSACTION 2 MK201
[SUCCESS] successfully added transaction item MK201
ADD_TRANSACTION 15 MK201 MM001
[SUCCESS] successfully added transaction item MK201 for member MM001
DELETE_ITEM MK201
[FAILED] there is at least one transaction taking item MK201
EXIT
exit status 1
[aldenluthfi@MacLaurin]—[~/Documents/Shenanigans/Go/a01d - sigmart]
[i]→ $

```

## [8] Testcase 2

### Tangkapan Layar Luaran Testcase 2

```

> gor un .
zsh: command not found: gor
> go run .
Name: Alden Luthfi, ID Student: 2206028932
=====
Welcome to Sigmart Point of Sales
Please input your command below
=====
ADD_MEMBER MM010 JAKA
[SUCCESS] successfully added member MM010 to list of members
ADD_ITEM XI021 XIAOMAY_14 14500
[FAILED] your input command is incorrect
ADD_MEMBER MM010 JOKO
[FAILED] member MM010 is already in list of members
ADD_TRANSACTION 2 XI021 MM010
[FAILED] item XI021 is not in list of items
ADD_ITEM SS910 SUMSANG_GALAXY_S24 9500000 20
[SUCCESS] successfully added item SS910 to list of items
ADD_TRANSACTION 1 SS910
[SUCCESS] successfully added transaction item SS910
TRANSACTION_ITEM_RECAP SS910
-x-x-x-x-x-x-x-x-x-x-x-x-
SKU: SS910, ID Member: -, Qty: 1, Total Price: 9500000
-x-x-x-x-x-x-x-x-x-x-x-x-
DELETE_MEMBER MM010
[SUCCESS] successfully deleted member MM010 from list of members
EXIT
exit status 1
[aldenluthfi@MacLaurin]—[~/Documents/Shenanigans/Go/a01d - sigmart]
[i]→ $

```

## [12] Testcase 3

### Tangkapan Layar Luaran Testcase 3

```
Name: Alden Luthfi, ID Student: 2206028932

Welcome to Sigmart Point of Sales
Please input your command below

ADD_MEMBER MM921 JONO
[SUCCESS] successfully added member MM921 to list of members
ADD_ITEM MR134 MIRONAGA_BALITA 21500 10
[SUCCESS] successfully added item MR134 to list of items
ADD_ITEM BB732 BOBOLAC_BATITA 34300 5
[SUCCESS] successfully added item BB732 to list of items
ADD_TRANSACTION 15 MR134 MM921
[FAILED] stock qty for item MR134 is not enough
ADD_MEMBER MM934 JONI
[SUCCESS] successfully added member MM934 to list of members
ADD_TRANSACTION 5 BB732 MM934
[SUCCESS] successfully added transaction item BB732 for member MM934
ADD_TRANSACTION 2 MR134
[SUCCESS] successfully added transaction item MR134
RESTOCK_ITEM BB732 2
[SUCCESS] successfully restock qty for item BB732
ADD_TRANSACTION 1 BB732
[SUCCESS] successfully added transaction item BB732
DELETE_MEMBER MR134
[FAILED] member MR134 is not in list of members
TRANSACTION_MEMBER_RECAP MM934
-x-x-x-x-x-x-x-x-x-x-x-x-x-x-
SKU: BB732, ID Member: MM934, Qty: 5, Total Price: 171500
-x-x-x-x-x-x-x-x-x-x-x-x-x-x-
TRANSACTION_ITEM_RECAP BB732
-x-x-x-x-x-x-x-x-x-x-x-x-x-x-
SKU: BB732, ID Member: MM934, Qty: 5, Total Price: 171500
-x-x-x-x-x-x-x-x-x-x-x-x-x-x-
EXIT
exit status 1
[aldenluthfi@Maclaurin]—[~/Documents/Shenanigans/Go/a01d - sigmart]
[i]➔ $
```