LAPORAN
Simulasi Pada Mininet

Disusun untuk memenuhi Tugas Besar

Mata Kuliah CII2J4 – Jaringan Komputer

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BAB I

CLO 1

A. Tabel Subnet

IP Jaringan: 192.168.0.0

Nama	Needs	Alokasi	Network ID	Host Range	Broadcast	Prefix	Subnet Mask
Host A	2	256	192.168.0.0	192.168.0.1 – 192.168.0.254	192.168.0.255	/24	255.255.255.0
Host B	2	256	192.168.1.0	192.168.1.1 – 192.168.1.254	192.168.1.255	/24	255.255.255.0
R1	2	256	192.168.2.0	192.168.2.1 – 192.168.2.254	192.168.2.255	/24	255.255.255.0
R2	2	256	192.168.3.0	192.168.3.1 – 192.168.3.254	192.168.3.255	/24	255.255.255.0
R3	4	256	192.168.4.0	192.168.4.1 – 192.168.4.254	192.168.4.255	/24	255.255.255.0
R4	4	256	192.168.5.0	192.168.5.1 – 192.168.5.254	192.168.5.255	/24	255.255.255.0
Net 1	2	256	192.168.6.0	192.168.6.1 – 192.168.6.254	192.168.6.255	/24	255.255.255.0
Net 2	2	256	192.168.7.0	192.168.7.1 – 192.168.7.254	192.168.7.255	/24	255.255.255.0

B. Topologi
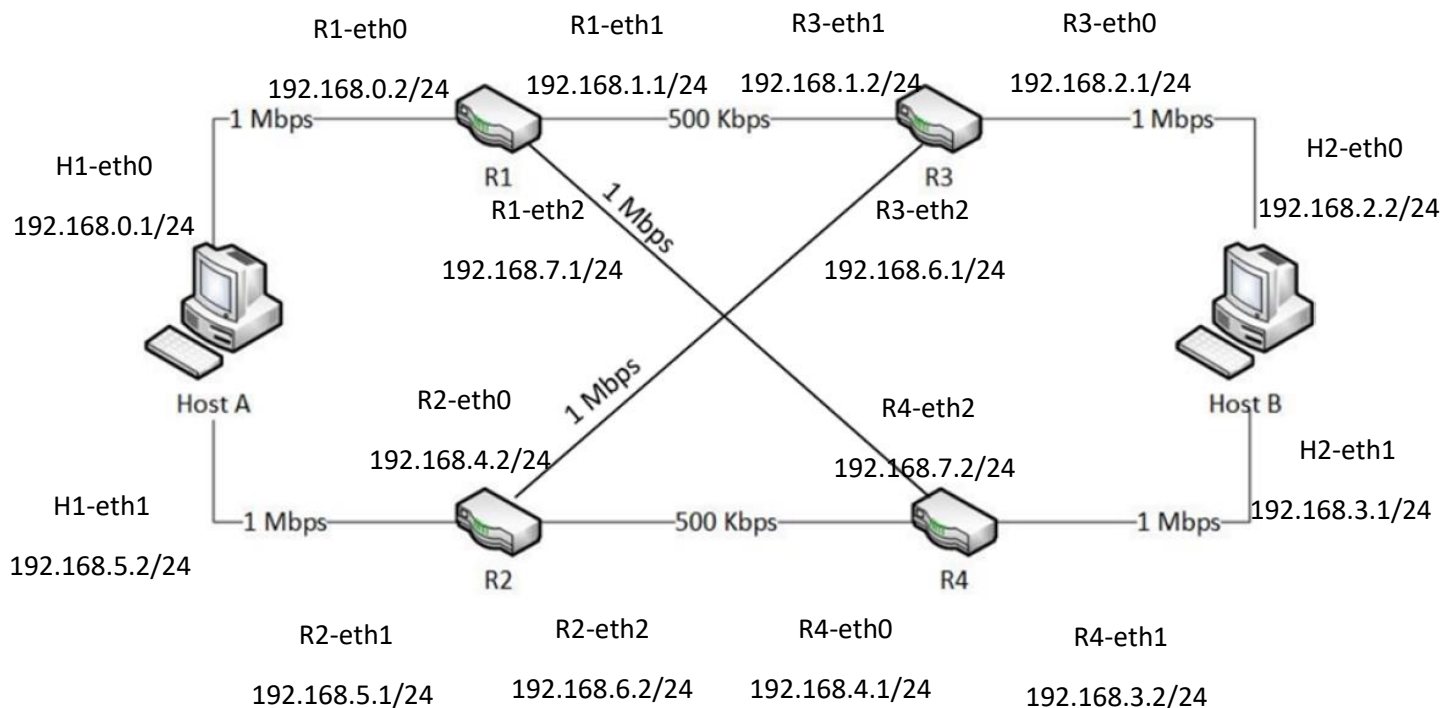
C. **Uji Konektivitas**

```
mininet> net
h1 h1-eth0:r1-eth0 h1-eth1:r2-eth1
h2 h2-eth0:r3-eth0 h2-eth1:r4-eth1
r1 r1-eth0:h1-eth0 r1-eth1:r3-eth1 r1-eth2:r4-eth2
r2 r2-eth1:h1-eth1 r2-eth2:r3-eth2 r2-eth0:r4-eth0
r3 r3-eth0:h2-eth0 r3-eth1:r1-eth1 r3-eth2:r2-eth2
r4 r4-eth1:h2-eth1 r4-eth2:r1-eth2 r4-eth0:r2-eth0
mininet> links
h1-eth0<->r1-eth0 (OK OK)
h1-eth1<->r2-eth1 (OK OK)
h2-eth0<->r3-eth0 (OK OK)
h2-eth1<->r4-eth1 (OK OK)
r1-eth1<->r3-eth1 (OK OK)
r1-eth2<->r4-eth2 (OK OK)
r2-eth2<->r3-eth2 (OK OK)
r2-eth0<->r4-eth0 (OK OK)
mininet>
```

BAB II
CLO 2

A. Ping Antar Host

   1. H1–R1

```
mininet> h1 ping r1
PING 192.168.0.2 (192.168.0.2) 56(84) bytes of data.
64 bytes from 192.168.0.2: icmp_seq=1 ttl=64 time=100 ms
64 bytes from 192.168.0.2: icmp_seq=2 ttl=64 time=100 ms
64 bytes from 192.168.0.2: icmp_seq=3 ttl=64 time=100 ms
64 bytes from 192.168.0.2: icmp_seq=4 ttl=64 time=100 ms
64 bytes from 192.168.0.2: icmp_seq=5 ttl=64 time=100 ms
64 bytes from 192.168.0.2: icmp_seq=6 ttl=64 time=100 ms
64 bytes from 192.168.0.2: icmp_seq=7 ttl=64 time=100 ms
^C
--- 192.168.0.2 ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6005ms
rtt min/avg/max/mdev = 100.074/100.311/100.709/0.397 ms
mininet>
```

   2. H1–R2

```
mininet> h1 ping r2
PING 192.168.5.1 (192.168.5.1) 56(84) bytes of data.
64 bytes from 192.168.5.1: icmp_seq=1 ttl=64 time=0.049 ms
64 bytes from 192.168.5.1: icmp_seq=2 ttl=64 time=0.038 ms
64 bytes from 192.168.5.1: icmp_seq=3 ttl=64 time=0.112 ms
64 bytes from 192.168.5.1: icmp_seq=4 ttl=64 time=0.088 ms
64 bytes from 192.168.5.1: icmp_seq=5 ttl=64 time=0.041 ms
64 bytes from 192.168.5.1: icmp_seq=6 ttl=64 time=0.060 ms
^C
--- 192.168.5.1 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5128ms
rtt min/avg/max/mdev = 0.038/0.064/0.112/0.028 ms
mininet>
```

   3. H2-R3

```
mininet> h2 ping r3
PING 192.168.2.1 (192.168.2.1) 56(84) bytes of data.
64 bytes from 192.168.2.1: icmp_seq=1 ttl=64 time=0.036 ms
64 bytes from 192.168.2.1: icmp_seq=2 ttl=64 time=0.037 ms
64 bytes from 192.168.2.1: icmp_seq=3 ttl=64 time=0.034 ms
64 bytes from 192.168.2.1: icmp_seq=4 ttl=64 time=0.038 ms
64 bytes from 192.168.2.1: icmp_seq=5 ttl=64 time=0.039 ms
^C
--- 192.168.2.1 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4076ms
rtt min/avg/max/mdev = 0.034/0.036/0.039/0.007 ms
mininet>
```

4. H2-R4

```
mininet> h2 ping r4
PING 192.168.3.2 (192.168.3.2) 56(84) bytes of data.
64 bytes from 192.168.3.2: icmp_seq=1 ttl=64 time=0.120 ms
64 bytes from 192.168.3.2: icmp_seq=2 ttl=64 time=0.037 ms
64 bytes from 192.168.3.2: icmp_seq=3 ttl=64 time=0.035 ms
64 bytes from 192.168.3.2: icmp_seq=4 ttl=64 time=0.038 ms
64 bytes from 192.168.3.2: icmp_seq=5 ttl=64 time=0.059 ms
^C
--- 192.168.3.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4089ms
rtt min/avg/max/mdev = 0.035/0.057/0.120/0.033 ms
mininet>
```

5. R1-R3

```
mininet> r1 ping r3
PING 192.168.2.1 (192.168.2.1) 56(84) bytes of data.
64 bytes from 192.168.2.1: icmp_seq=1 ttl=64 time=0.035 ms
64 bytes from 192.168.2.1: icmp_seq=2 ttl=64 time=0.036 ms
64 bytes from 192.168.2.1: icmp_seq=3 ttl=64 time=0.047 ms
64 bytes from 192.168.2.1: icmp_seq=4 ttl=64 time=0.041 ms
64 bytes from 192.168.2.1: icmp_seq=5 ttl=64 time=0.050 ms
^C
--- 192.168.2.1 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4102ms
rtt min/avg/max/mdev = 0.035/0.041/0.050/0.010 ms
mininet>
```

6. R1-R4

```
mininet> r1 ping r4
PING 192.168.3.2 (192.168.3.2) 56(84) bytes of data.
64 bytes from 192.168.3.2: icmp_seq=1 ttl=64 time=0.078 ms
64 bytes from 192.168.3.2: icmp_seq=2 ttl=64 time=0.037 ms
64 bytes from 192.168.3.2: icmp_seq=3 ttl=64 time=0.036 ms
64 bytes from 192.168.3.2: icmp_seq=4 ttl=64 time=0.094 ms
64 bytes from 192.168.3.2: icmp_seq=5 ttl=64 time=0.060 ms
^C
--- 192.168.3.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4079ms
rtt min/avg/max/mdev = 0.036/0.061/0.094/0.022 ms
mininet>
```

7. R2-R3

```
mininet> r2 ping r3
PING 192.168.2.1 (192.168.2.1) 56(84) bytes of data.
64 bytes from 192.168.2.1: icmp_seq=1 ttl=64 time=0.048 ms
64 bytes from 192.168.2.1: icmp_seq=2 ttl=64 time=0.084 ms
64 bytes from 192.168.2.1: icmp_seq=3 ttl=64 time=0.038 ms
64 bytes from 192.168.2.1: icmp_seq=4 ttl=64 time=0.038 ms
64 bytes from 192.168.2.1: icmp_seq=5 ttl=64 time=0.107 ms
^C
--- 192.168.2.1 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4085ms
rtt min/avg/max/mdev = 0.038/0.063/0.107/0.027 ms
mininet>
```

8. R2-R4

```
mininet> h2 ping r4
PING 192.168.3.2 (192.168.3.2) 56(84) bytes of data.
64 bytes from 192.168.3.2: icmp_seq=1 ttl=64 time=0.120 ms
64 bytes from 192.168.3.2: icmp_seq=2 ttl=64 time=0.037 ms
64 bytes from 192.168.3.2: icmp_seq=3 ttl=64 time=0.035 ms
64 bytes from 192.168.3.2: icmp_seq=4 ttl=64 time=0.038 ms
64 bytes from 192.168.3.2: icmp_seq=5 ttl=64 time=0.059 ms
^C
--- 192.168.3.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4089ms
rtt min/avg/max/mdev = 0.035/0.057/0.120/0.033 ms
mininet>
```

Berdasarkan hasil uji coba ping dapat dilihat bahwa setiap ping berhasil

B. Routing Table (Dibuktikan Ping antar Host)

```
mininet> h1 ping h2
PING 192.168.2.2 (192.168.2.2) 56(84) bytes of data.
64 bytes from 192.168.2.2: icmp_seq=1 ttl=62 time=100 ms
64 bytes from 192.168.2.2: icmp_seq=2 ttl=62 time=100 ms
64 bytes from 192.168.2.2: icmp_seq=3 ttl=62 time=100 ms
64 bytes from 192.168.2.2: icmp_seq=4 ttl=62 time=100 ms
64 bytes from 192.168.2.2: icmp_seq=5 ttl=62 time=100 ms
64 bytes from 192.168.2.2: icmp_seq=6 ttl=62 time=100 ms
64 bytes from 192.168.2.2: icmp_seq=7 ttl=62 time=100 ms
^C
--- 192.168.2.2 ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6008ms
rtt min/avg/max/mdev = 100.064/100.236/100.788/0.412 ms
mininet>
```

C. Menganalisis Menggunakan Traceroute

```
mininet> h1 traceroute h2
traceroute to 192.168.2.2 (192.168.2.2), 30 hops max, 60 byte packets
 1  _gateway (192.168.0.2)  100.049 ms  100.011 ms  100.795 ms
 2  192.168.1.2 (192.168.1.2)  100.787 ms  100.764 ms  100.750 ms
 3  192.168.2.2 (192.168.2.2)  100.737 ms  100.714 ms  100.697 ms
mininet>
```

Dengan menggunakan traceroute dapat dilihat bahwa rute yang dilalui dari jaringan h1 dan h 2 adalah berawal dari 192.168.0.2 kemudian ke 192.168.1.2 dan sampai di 192.168.2.2

BAB II
CLO 3

A. Test Traffic Menggunakan Iperf

1. Command

2. Output Wireshark

BAB 4
CLO 4

A. Test buffer

1. Bufffer 20

```
mininet> h1 ping h2 -c 10
PING 192.168.2.2 (192.168.2.2) 56(84) bytes of data.
64 bytes from 192.168.2.2: icmp_seq=1 ttl=62 time=0.055 ms
64 bytes from 192.168.2.2: icmp_seq=2 ttl=62 time=0.057 ms
64 bytes from 192.168.2.2: icmp_seq=3 ttl=62 time=0.069 ms
64 bytes from 192.168.2.2: icmp_seq=4 ttl=62 time=0.055 ms
64 bytes from 192.168.2.2: icmp_seq=5 ttl=62 time=0.054 ms
64 bytes from 192.168.2.2: icmp_seq=6 ttl=62 time=0.064 ms
64 bytes from 192.168.2.2: icmp_seq=7 ttl=62 time=0.054 ms
64 bytes from 192.168.2.2: icmp_seq=8 ttl=62 time=0.054 ms
64 bytes from 192.168.2.2: icmp_seq=9 ttl=62 time=0.106 ms
64 bytes from 192.168.2.2: icmp_seq=10 ttl=62 time=0.062 ms

--- 192.168.2.2 ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9208ms
rtt min/avg/max/mdev = 0.054/0.063/0.106/0.015 ms
mininet>
```

2. Buffer 40

```
mininet> h1 ping h2 -c 10
PING 192.168.2.2 (192.168.2.2) 56(84) bytes of data.
64 bytes from 192.168.2.2: icmp_seq=1 ttl=62 time=0.069 ms
64 bytes from 192.168.2.2: icmp_seq=2 ttl=62 time=0.054 ms
64 bytes from 192.168.2.2: icmp_seq=3 ttl=62 time=0.055 ms
64 bytes from 192.168.2.2: icmp_seq=4 ttl=62 time=0.078 ms
64 bytes from 192.168.2.2: icmp_seq=5 ttl=62 time=0.056 ms
64 bytes from 192.168.2.2: icmp_seq=6 ttl=62 time=0.056 ms
64 bytes from 192.168.2.2: icmp_seq=7 ttl=62 time=0.054 ms
64 bytes from 192.168.2.2: icmp_seq=8 ttl=62 time=0.089 ms
64 bytes from 192.168.2.2: icmp_seq=9 ttl=62 time=0.058 ms
64 bytes from 192.168.2.2: icmp_seq=10 ttl=62 time=0.092 ms

--- 192.168.2.2 ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9196ms
rtt min/avg/max/mdev = 0.054/0.066/0.092/0.014 ms
mininet>
```

3. Buffer 60

```
mininet> h1 ping h2 -c 10
PING 192.168.2.2 (192.168.2.2) 56(84) bytes of data.
64 bytes from 192.168.2.2: icmp_seq=1 ttl=62 time=0.054 ms
64 bytes from 192.168.2.2: icmp_seq=2 ttl=62 time=0.094 ms
64 bytes from 192.168.2.2: icmp_seq=3 ttl=62 time=0.055 ms
64 bytes from 192.168.2.2: icmp_seq=4 ttl=62 time=0.058 ms
64 bytes from 192.168.2.2: icmp_seq=5 ttl=62 time=0.066 ms
64 bytes from 192.168.2.2: icmp_seq=6 ttl=62 time=0.075 ms
64 bytes from 192.168.2.2: icmp_seq=7 ttl=62 time=0.054 ms
64 bytes from 192.168.2.2: icmp_seq=8 ttl=62 time=0.055 ms
64 bytes from 192.168.2.2: icmp_seq=9 ttl=62 time=0.055 ms
64 bytes from 192.168.2.2: icmp_seq=10 ttl=62 time=0.061 ms

--- 192.168.2.2 ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9198ms
rtt min/avg/max/mdev = 0.054/0.062/0.094/0.015 ms
mininet>
```

4. Buffer 100

```
mininet> h1 ping h2 -c 10
PING 192.168.2.2 (192.168.2.2) 56(84) bytes of data.
64 bytes from 192.168.2.2: icmp_seq=1 ttl=62 time=0.048 ms
64 bytes from 192.168.2.2: icmp_seq=2 ttl=62 time=0.100 ms
64 bytes from 192.168.2.2: icmp_seq=3 ttl=62 time=0.055 ms
64 bytes from 192.168.2.2: icmp_seq=4 ttl=62 time=0.056 ms
64 bytes from 192.168.2.2: icmp_seq=5 ttl=62 time=0.056 ms
64 bytes from 192.168.2.2: icmp_seq=6 ttl=62 time=0.055 ms
64 bytes from 192.168.2.2: icmp_seq=7 ttl=62 time=0.062 ms
64 bytes from 192.168.2.2: icmp_seq=8 ttl=62 time=0.061 ms
64 bytes from 192.168.2.2: icmp_seq=9 ttl=62 time=0.062 ms
64 bytes from 192.168.2.2: icmp_seq=10 ttl=62 time=0.056 ms

--- 192.168.2.2 ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9220ms
rtt min/avg/max/mdev = 0.048/0.061/0.100/0.014 ms
mininet>
```

B. Kesimpulan

Perubahan delay pada buffer baru akan terasa saat buffer di set di atas 60 dimana saat buffer si set 100 didapatkan waktu delay terlama.