

PRAKTIKUM DESAIN DAN MANAJEMEN JARINGAN KOMPUTER

Nama	Aliyah Rizky Al-Afifah Polanda	No. Modul	06
NPM	2206024682	Tipe	Case Study

1. Pengalamatan IP.

- Branch_DC:

```
Branch_DC(config)#int g0/0
Branch_DC(config-if)#ip add 10.4.9.1 255.255.255.252
Branch_DC(config-if)#no sh
Branch_DC(config-if)#int g0/1
Branch_DC(config-if)#ip add 192.168.49.1 255.255.255.0
Branch_DC(config-if)#no sh
```


- Main_DC:


```
Main_DC(config)#int g0/0
Main_DC(config-if)#ip add 10.4.9.2 255.255.255.252
Main_DC(config-if)#no sh
Main_DC(config-if)#int g0/1
Main_DC(config-if)#ip add 192.168.92.1 255.255.255.0
Main_DC(config-if)#no sh
Main_DC(config-if)#int g0/2
Main_DC(config-if)#ip add 10.9.2.2 255.255.255.252
Main_DC(config-if)#no sh
```

- Internet:

```
Internet(config)#int g0/1
Internet(config-if)#ip add 192.168.42.1 255.255.255.0
Internet(config-if)#no sh
Internet(config-if)#int g0/2
Internet(config-if)#ip add 10.9.2.1 255.255.255.252
Internet(config-if)#no sh
```

- End devices:

 iPhone 15

 Zephyrus G14

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface Wireless0

IP Configuration

☐ DHCP
☒ Static

IPv4 Address 192.168.49.2

Subnet Mask 255.255.255.0

Default Gateway 192.168.49.1

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface Wireless0

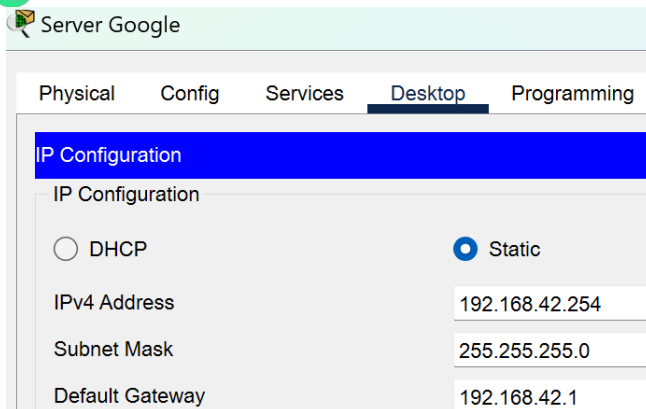
IP Configuration

☐ DHCP
☒ Static

IPv4 Address 192.168.92.2

Subnet Mask 255.255.255.0

Default Gateway 192.168.92.1



2. Konfigurasi hostname, banner motd, dan ssh.

- Branch_DC:

```
Router(config)#host Branch_DC
Branch_DC(config)#banner motd "AliyahRizky_2206024682"
Branch_DC(config)#username netlab secret cisco
Branch_DC(config)#ip domain-name netlab.com
Branch_DC(config)#crypto key gen rsa
Branch_DC(config)#line vty 0 4
*Mar 1 0:12:38.527: RSA key size needs to be at least 768 bi
*Mar 1 0:12:38.527: %SSH-5-ENABLED: SSH 1.5 has been enabled
Branch_DC(config-line)#trans in ssh
Branch_DC(config-line)#login local
Branch_DC(config)#ip ssh ver 2
```

- Main_DC:

```
Router(config)#host Main_DC
Main_DC(config)#banner motd "AliyahRizky_2206024682"

Main_DC(config)#username netlab secret cisco
Main_DC(config)#ip domain-name netlab.com
Main_DC(config)#crypto key gen rsa
Main_DC(config)#line vty 0 4
*Mar 1 0:16:51.438: %SSH-5-ENABLED:
Main_DC(config-line)#trans in ssh
Main_DC(config-line)#login loc
Main_DC(config)#ip ssh ver 2
```

- Internet:

```
Router(config)#host Internet
Internet(config)#banner motd "AliyahRizky_2206024682"
Internet(config)#username netlab secret cisco
Internet(config)#ip domain-name netlab.com
Internet(config)#crypto key gen rsa
Internet(config)#line vty 0 4
*Mar 1 0:19:33.160: %SSH-5-ENABLED: SSH 1.99 has
Internet(config-line)#trans in ssh
Internet(config-line)#login local
Internet(config-line)#exit
Internet(config)#ip ssh ver 2
```

3. Routing EIGRP.

```
Branch_DC(config)#router eigrp 78
Branch_DC(config-router)#net 10.4.9.0 0.0.0.3
Branch_DC(config-router)#net 192.168.49.0 0.0.0.255
Branch_DC(config-router)#passive g0/1
Main_DC(config)#router eigrp 78
Main_DC(config-router)#net 10.4.9.0 0.0.0.3
Main_DC(config-router)#net 192.168.92.0 0.0.0.255
Main_DC(config-router)#net 10.9.2.0 0.0.0.3
Main_DC(config-router)#passive g0/1
Main_DC(config-router)#no auto-sum
Internet(config)#router eigrp 78
Internet(config-router)#net 192.168.42.0 0.0.0.255
Internet(config-router)#net 10.9.2.0 0.0.0.3
Internet(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 78: Neighbor 10.9.2.2 (
Internet(config-router)#passive g0/1
Internet(config-router)#no auto
```

4. Cek konektivitas.

Last Status	Source	Destination
Successful	iPhone 15	Zephyrus G14
Successful	iPhone 15	Server Google
Successful	Zephyrus...	Server Google

PDU yang dilakukan antar jaringan berhasil. Hal ini karena telah diterapkan EIGRP dalam topologi, sehingga perangkat yang berbeda jaringan tetap dapat saling berkomunikasi.

Class-Based Weighted Fair Queuing

5. Access-list:

```
Main_DC(config)#access-list 149 permit eigrp any any
Main_DC(config)#access-list 149 permit tcp host 192.168.92.2 host 192.168.42.254 eq www
Main_DC(config)#access-list 149 permit tcp host 192.168.92.2 host 192.168.42.254 eq 22
Main_DC(config)#access-list 149 permit icmp host 192.168.92.2 host 192.168.42.254
Main_DC(config)#access-list 149 permit tcp host 192.168.49.2 host 192.168.42.254 eq www
Main_DC(config)#access-list 149 permit tcp host 192.168.49.2 host 192.168.42.254 eq 22
Main_DC(config)#access-list 149 permit icmp host 192.168.49.2 host 192.168.42.254
Main_DC(config)#int g0/2
Main_DC(config-if)#ip acc
Main_DC(config-if)#ip access-group 149 out
```

6. Class map:

```
Main_DC(config)#class-map HTTP
Main_DC(config-cmap)#match access-group 149
Main_DC(config-cmap)#match protocol http
Main_DC(config)#class-map SSH
Main_DC(config-cmap)#match access-group 149
Main_DC(config-cmap)#match protocol ssh
Main_DC(config)#class-map IPP-5
Main_DC(config-cmap)#match precedence critical
```

7. Policy map:

```
Main_DC(config)#policy-map egress-QoS
```

```
Main_DC(config-pmap)#class HTTP
Main_DC(config-pmap-c)#bandwidth percent 25
Main_DC(config-pmap-c)#queue-limit 1024
Main_DC(config-pmap)#class SSH
Main_DC(config-pmap-c)#bandwidth percen 10
Main_DC(config-pmap)#class IPP-5
Main_DC(config-pmap-c)#bandwidth percen 5
Main_DC(config-pmap)#class class-default
Main_DC(config-pmap-c)#fair-queue
```

8. Service policy.

```
Main_DC(config)#int g0/2
Main_DC(config-if)#service-policy output egress-QoS
```

9. Verifikasi policy-map:

```
Main_DC#sh poli int g0/2
GigabitEthernet0/2

Service-policy output: egress-QoS

Class-map: HTTP (match-all)
  0 packets, 0 bytes
  5 minute offered rate 0 bps, drop rate 0 bps
  Match: access-group 149
  Match: protocol http
  Queueing
    Output Queue: Conversation 265
    Bandwidth 25 (%)
    Bandwidth 250000 (kbps)Max Threshold 1024 (packets)
    (pkts matched/bytes matched) 0/0
    (depth/total drops/no-buffer drops) 0/0/0

Class-map: SSH (match-all)
  0 packets, 0 bytes
  5 minute offered rate 0 bps, drop rate 0 bps
  Match: access-group 149
  Match: protocol ssh
  Queueing
    Output Queue: Conversation 266
    Bandwidth 10 (%)
    Bandwidth 100000 (kbps)Max Threshold 64 (packets)
    (pkts matched/bytes matched) 0/0
    (depth/total drops/no-buffer drops) 0/0/0

Class-map: IPP-5 (match-all)
  0 packets, 0 bytes
  5 minute offered rate 0 bps, drop rate 0 bps
  Match: precedence 5
  Queueing
    Output Queue: Conversation 267
    Bandwidth 5 (%)
    Bandwidth 50000 (kbps)Max Threshold 64 (packets)
    (pkts matched/bytes matched) 0/0
    (depth/total drops/no-buffer drops) 0/0/0

Class-map: class-default (match-any)
  16 packets, 1222 bytes
  5 minute offered rate 38 bps, drop rate 0 bps
  Match: any
  Queueing
    Flow Based Fair Queueing
    Maximum number of Hashed Queues 256
    Bandwidth 750000 (kbps)Max Threshold 64 (packets)
    (total queued/total drops/no-buffer drops) 0/0/0
```

Service policy diterapkan pada interface g0/2 di Main_DC. Terdapat 4 kelas yang ada dalam policy map tersebut, yaitu HTTP, SSH, IPP-5, dan class-default. Beberapa informasi yang dapat disimpulkan dari hasil tersebut adalah:

- Tidak ada paket yang sesuai dengan class-map HTTP, SSH, dan IPP-5 dalam 5 menit terakhir. Saat dilakukan akses web server google dari Zephyrus G14, terdapat perubahan yang terjadi pada class-map HTTP:

```
Class-map: HTTP (match-all)
  5 packets, 205 bytes
  5 minute offered rate 10 bps, drop rate 0 bps
  Match: access-group 149
  Match: protocol http
  Queueing
    Output Queue: Conversation 265
    Bandwidth 25 (%)
    Bandwidth 250000 (kbps)Max Threshold 1024 (packets)
    (pkts matched/bytes matched) 0/0
    (depth/total drops/no-buffer drops) 0/0/0
```

- b. Hasil juga menunjukkan masing-masing class-map akan disesuaikan dengan kriteria apa saja, seperti access-group 149, http, ssh, dan lainnya.
- c. Menampilkan bandwidth yang dialokasikan ke setiap class-map.
- d. Class-map class-default akan menyesuaikan semua jenis lalu lintas dan memiliki alokasi bandwidth selain yang telah digunakan class-map HTTP, SSH, dan IPP-5.

10. Mengubah bandwidth class-map class-default.

```
Main_DC(config)#poli egress-QoS
Main_DC(config-pmap)#class class-def
Main_DC(config-pmap-c)#band persen 35
```

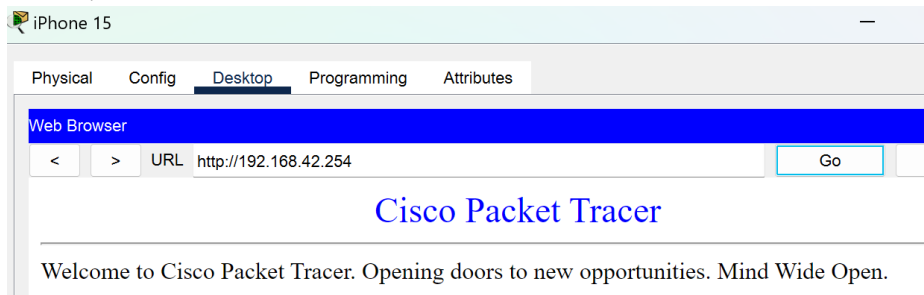
Testing

11. SSH.

```
C:\>SSH -l netlab 10.9.2.1
% Connection timed out; remote host not responding
```

Tidak ada perubahan karena koneksi dengan SSH tidak berhasil dilakukan.

12. HTTP.



```
Class-map: HTTP (match-all)
  10 packets, 410 bytes
  5 minute offered rate 9 bps, drop rate 0 bps
  Match: access-group 149
  Match: protocol http
  Queueing
    Output Queue: Conversation 265
    Bandwidth 25 (%)
    Bandwidth 250000 (kbps)Max Threshold 1024 (packets)
    (pkts matched/bytes matched) 0/0
    (depth/total drops/no-buffer drops) 0/0/0
```

Terjadi pertambahan jumlah paket yang sesuai dengan class-map HTTP. Hal ini karena telah dilakukan akses HTTP dari iPhone 15 ke server Google. Semua paket sesuai dengan class-map HTTP, sehingga tidak ada paket yang dijatuhkan atau ditunda.

13. Ping.

```
C:\>ping 192.168.42.254

Pinging 192.168.42.254 with 32 bytes of data:

Reply from 192.168.42.254: bytes=32 time=32ms TTL=126
Reply from 192.168.42.254: bytes=32 time=6ms TTL=126
Reply from 192.168.42.254: bytes=32 time=63ms TTL=126
Reply from 192.168.42.254: bytes=32 time=12ms TTL=126

Ping statistics for 192.168.42.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 6ms, Maximum = 63ms, Average = 28ms
```

```
Class-map: class-default (match-any)
  351 packets, 27537 bytes
  5 minute offered rate 184 bps, drop rate 0 bps
  Match: any
```

```
Class-map: class-default (match-any)
  392 packets, 30793 bytes
  5 minute offered rate 193 bps, drop rate 0 bps
  Match: any
```

Terjadi penambahan paket yang sesuai dengan class-default. Hal ini karena paket ICMP termasuk dalam kriteria class-default.

Kesimpulan

14. Tujuan pemberian policy:

- Untuk mengelola traffic berdasarkan prioritas yang telah diterapkan pada setiap jenis lalu lintas.
- Menghindari terjadinya congestion yang dapat terjadi karena penumpukan paket akibat banyaknya paket yang berada dalam jaringan.
- Alokasi bandwidth dapat dikelola dengan lebih baik dan memberikan alokasi yang lebih besar pada jenis traffic yang memiliki prioritas lebih tinggi.
- Menjaga keamanan jaringan.