

LAPORAN PRAKTIKUM KONFIGURASI JARINGAN



Judul Tugas: Konfigurasi Jaringan Mikrotik Berbasis VLAN dan Hotspot

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Jurusan: Pengembangan Sistem Jaringan (PSJ)

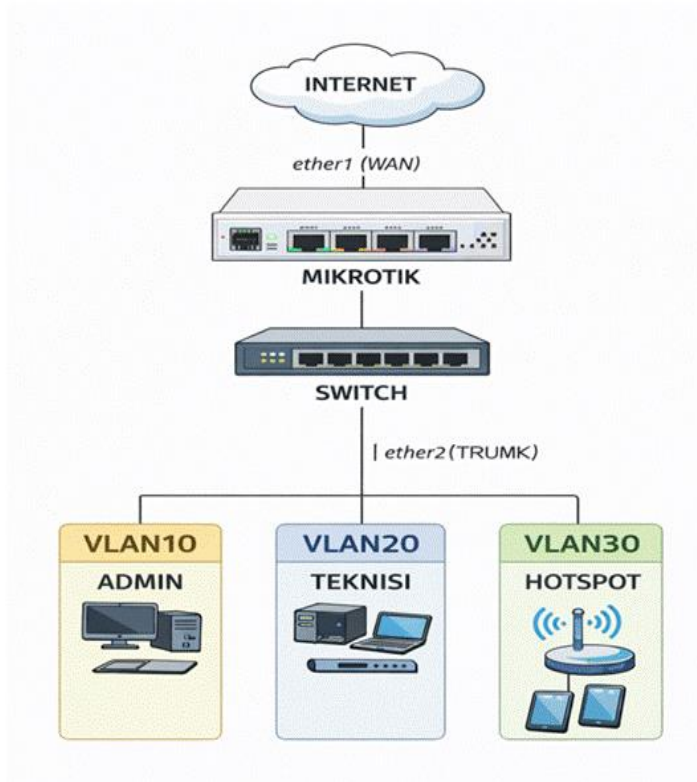
Jabatan: Junior Technician

1. Kebutuhan Utama

Berdasarkan skenario, sistem jaringan ini memerlukan:

1. **Segmentasi VLAN:** VLAN 10 (ADMIN), VLAN 20 (TEKNISI), dan VLAN 30 (HOTSPOT).
2. **Trunking:** Jalur trunk melalui ether2 menuju switch.
3. **Layanan Jaringan:** DHCP Server di setiap VLAN dan NAT untuk akses internet.
4. **Keamanan:** Firewall Filter untuk membatasi akses antar segmen.
5. **Manajemen Pengguna:** Captive Portal (Hotspot) untuk VLAN 30.
6. **Manajemen Bandwidth:** Limitasi 5 Mbps per jaringan.

TOPOLOGI JARINGAN



2. Spesifikasi Pengalamatan IP

Nama Interface	VLAN ID	IP Address	DHCP Pool	Keterangan
ether1 (WAN)	-	Dynamic (ISP)	DHCP -Client	Sumber Internet
vlan10-ADMIN	10	192.168.10.1/24	192.168.10.10-192.168.10.20	Akses Penuh
vlan20-TEKNISI	20	192.168.20.1/24	192.168.20.30-192.168.20.40	Hanya Internet
vlan30-HOTSPOT	30	192.168.30.1/24	192.168.30.20-192.168.30.40	Login Portal

3. Langkah-Langkah & Bukti Konfigurasi

A. Konfigurasi Interface VLAN (Trunk)

Membuat interface VLAN 10, 20, dan 30 pada ether2 sebagai jalur utama ke Switch.

Interfaces										
Interface										
	Name	Type	Actual MTU	L2 MTU	Tx	Rx	Tx Packet	Rx Packet	FP Tx	
<input type="checkbox"/>	ether1-WAN	Ethernet	1500	1598		0 bps	1536 bps	0	3	(
<input type="checkbox"/>	ether2-TRU...	Ethernet	1500	1598		0 bps	0 bps	0	0	(
<input type="checkbox"/>	vlan10-A...	VLAN	1500	1594		0 bps	0 bps	0	0	(
<input type="checkbox"/>	vlan20-T...	VLAN	1500	1594		0 bps	0 bps	0	0	(
<input type="checkbox"/>	vlan30-H...	VLAN	1500	1594		0 bps	0 bps	0	0	(
<input checked="" type="checkbox"/>	ether3	Ethernet	1500	1598		107.8 kbps	10.7 kbps	10	13	(
<input type="checkbox"/>	ether4	Ethernet	1500	1598		0 bps	0 bps	0	0	(
<input type="checkbox"/>	ether5	Ethernet	1500	1598		0 bps	0 bps	0	0	(
<input checked="" type="checkbox"/>	lo	Loopback	65536			0 bps	0 bps	0	0	(
<input checked="" type="checkbox"/>	wlan1	Wireless (Atheros AR...	1500	1600		0 bps	0 bps	0	0	(
<input type="checkbox"/>	wlan2	Wireless (Atheros AR...	1500	1600		0 bps	0 bps	0	0	(

Interfaces											
VLAN											
	Name	Type	MTU	Actual MTU	L2 MTU	VLAN ID	Interface	Tx	Rx	Tx Packet	Rx Packet
<input type="checkbox"/>	vlan10-ADMIN	VLAN	1500	1500	1594	10	ether2-TRUNK		0 bps	0 bps	0
<input type="checkbox"/>	vlan20-TEKNISI	VLAN	1500	1500	1594	20	ether2-TRUNK		0 bps	0 bps	0
<input type="checkbox"/>	vlan30-HOTSP...	VLAN	1500	1500	1594	30	ether2-TRUNK		0 bps	0 bps	0

B. Konfigurasi IP Address & DHCP Server & DHCP-Client Untuk Ether1

Membuat Dhcp-Client di ether1-WAN : `/ip dhcp-client add interface=ether1 disabled=no`

Memberikan alamat IP pada masing-masing interface agar dapat menjadi gateway bagi client.

Addresses					
	Address	Network	Interface	VRF	
<input type="checkbox"/>	192.168.4.53/24	192.168.4.0	ether1 - WAN	main	
<input type="checkbox"/>	192.168.10.1/24	192.168.10.0	vlan10 - ADMIN	main	
<input type="checkbox"/>	192.168.20.1/24	192.168.20.0	vlan20 - TEKNISI	main	
<input type="checkbox"/>	192.168.30.1/24	192.168.30.0	vlan30 - HOTSPOT	main	

4 Live

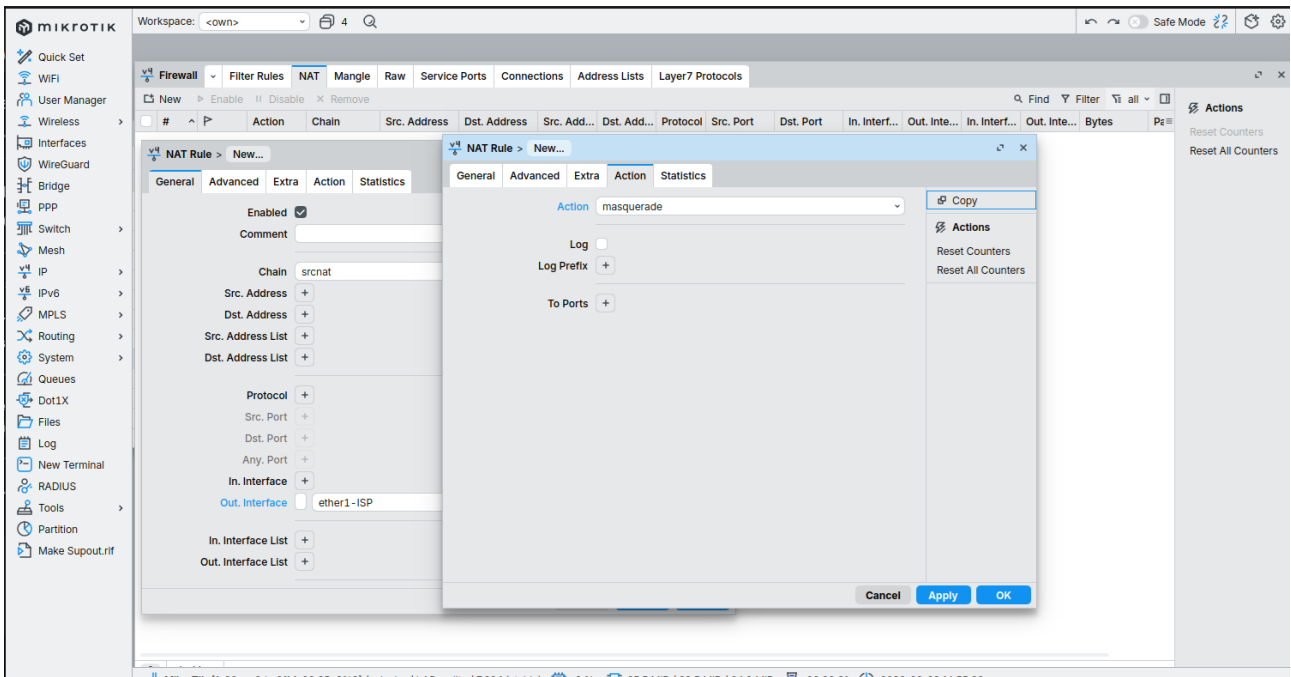
Pool						
Name	Addresses	Next Pool	Total	Used	Available	
dhcp_pool7	192.168.10.10-192.168.10.20	none	11	1	10	
dhcp_pool8	192.168.20.30-192.168.20.40	none	11	0	11	
dhcp_pool9	192.168.30.20-192.168.30.40	none	21	0	21	

3 Live

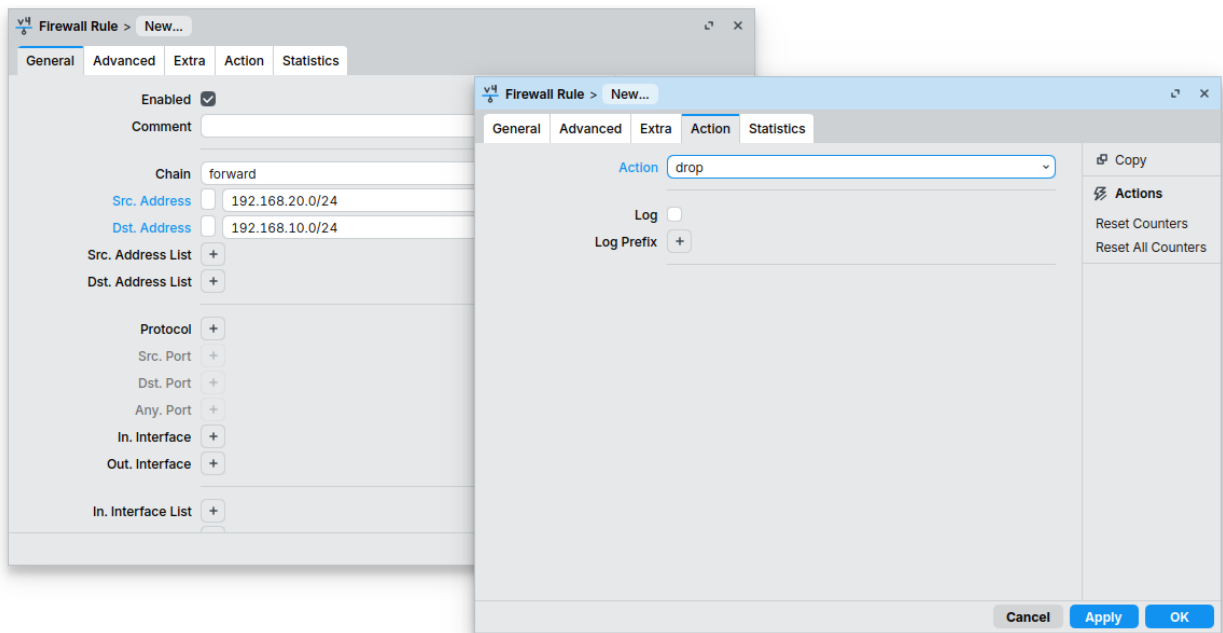
C.

Konfigurasi Firewall & NAT

Mengaktifkan NAT Masquerade agar client bisa terhubung ke internet dan menyusun Firewall Filter untuk pembatasan akses.



Rule: Drop TEKNISI (VLAN 20) to ADMIN (VLAN 10)



D. Konfigurasi Hotspot (VLAN 30)

Mengaktifkan layanan Hotspot pada interface VLAN 30.

Hotspot Servers Server Profi Users User Profile Active Hosts IP Bindings Service Por Walled Garc Walled Garc Cookies

New Enable Disable Remove Find Filter

Name	Interface	Address Pool	Profile	Addresses ...
• hotspot1	vlan30-HOTSPOT	dhcp_pool3	hsprof1	2

1 Live

Actions
Reset HTML
Hotspot Setup

Interface > wlan1

General Wireless HT WDS Nstreme NV2 Status Traffic

Mode: ap bridge

Band: 2GHz - B/G

Channel Width: 20MHz

Frequency: 2412

SSID: HOTSPOT - Siswa.id

Security Profile: default

WPS Mode: push button

Frequency Mode: regulatory - domain

Country: etsi

Installation: any

Default AP Tx Limit: +

Default Client Tx Limit: +

Default Authenticate:

Default Forward:

Hide SSID:

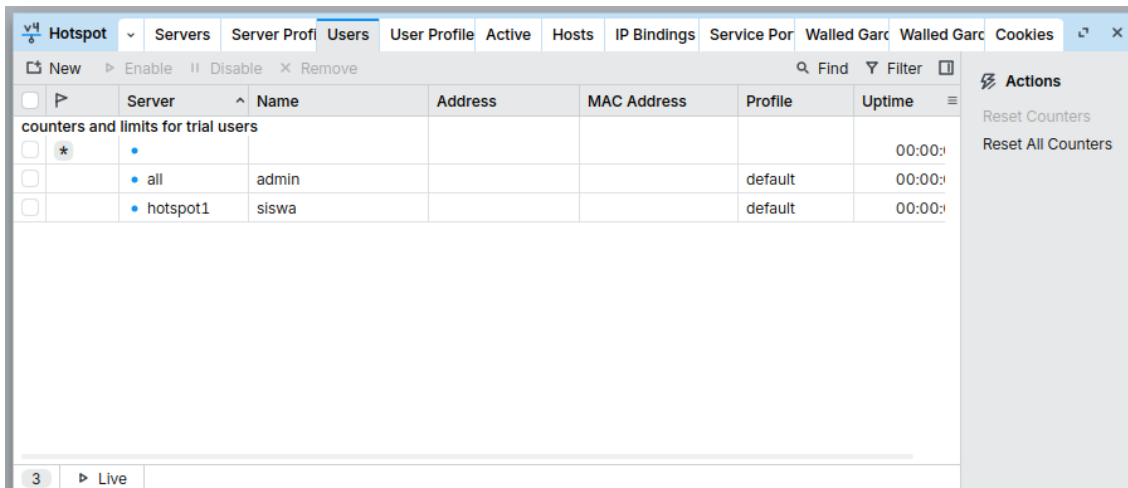
Advanced Mode:

Actions

- Torch
- Reset Traffic Counters
- WPS Accept
- WPS Client
- Setup Repeater
- Scan...
- Freq. Usage...
- Align...
- Sniff...
- Snooper...
- Reset Configuration
- Reset MAC Address

running ap

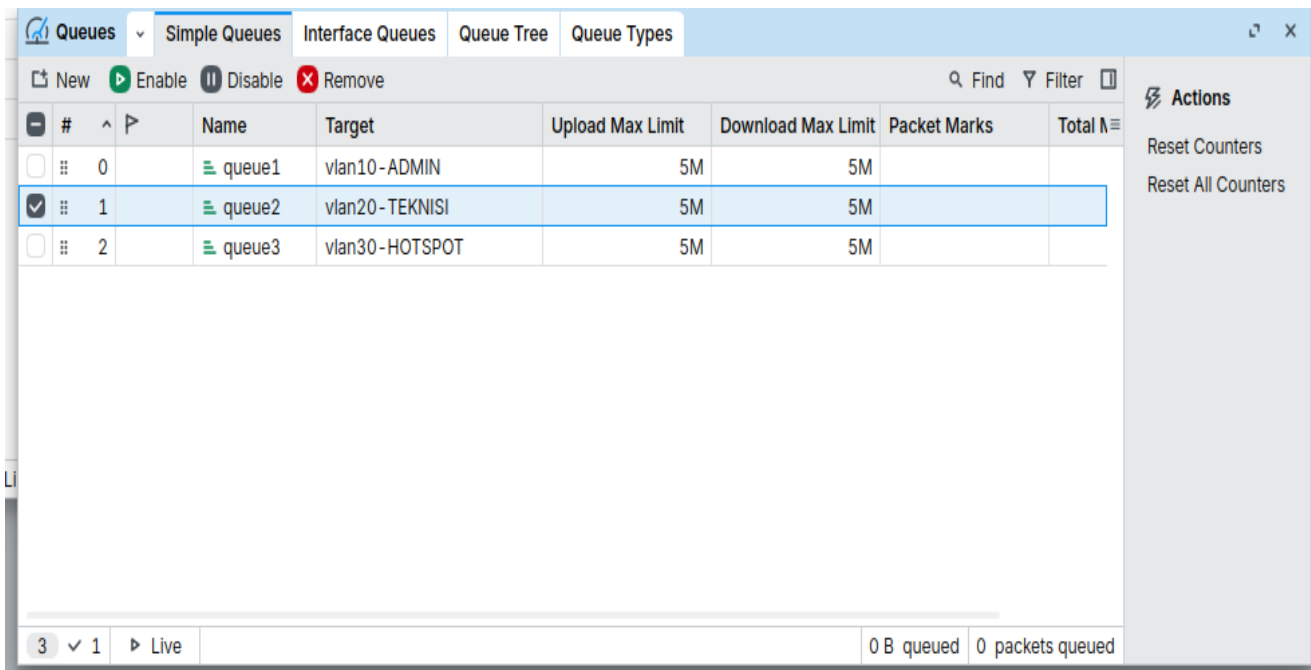
SLAVE Cancel Apply OK



E.

Konfigurasi Manajemen Bandwidth

Membatasi trafik download/upload maksimal 5 Mbps untuk setiap segmen jaringan.



4. Hasil Pengujian (Troubleshooting)

Hasil Dari VLAN 20 TEKNISI :Mendapatkan Ip 192.168.20.40/24

```
Terminal
petik-04@petik-04:~$ 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: enp2s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
   link/ether 18:c0:4d:ca:88:57 brd ff:ff:ff:ff:ff:ff
   inet 192.168.20.40/24 brd 192.168.20.255 scope global dynamic noprefixroute enp2s0
       valid_lft 1212sec preferred_lft 1212sec
   inet6 fe80::7d4c:299c:f68d:bbf7/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
3: docker0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default
   link/ether be:17:6c:47:ce:9d brd ff:ff:ff:ff:ff:ff
   inet 172.17.0.1/16 brd 172.17.255.255 scope global docker0
       valid_lft forever preferred_lft forever
petik-04@petik-04:~$ ping google.com
PING google.com (74.125.68.99) 56(84) bytes of data:
64 bytes from sc-in-f99.1e100.net (74.125.68.99): icmp_seq=1 ttl=105 time=18.2 ms
64 bytes from sc-in-f99.1e100.net (74.125.68.99): icmp_seq=2 ttl=105 time=18.1 ms
64 bytes from sc-in-f99.1e100.net (74.125.68.99): icmp_seq=3 ttl=105 time=18.0 ms
64 bytes from sc-in-f99.1e100.net (74.125.68.99): icmp_seq=4 ttl=105 time=18.1 ms
^C
--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3003ms
rtt min/avg/max/mdev = 17.954/18.107/18.242/0.102 ms
petik-04@petik-04:~$
```

Hasil Dari VLAN 10 ADMIN :Mendapatkan Ip 192.168.10.19/24

```
Terminal
petik-04@petik-05:~$ 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: enp2s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
   link/ether 18:c0:4d:ca:88:57 brd ff:ff:ff:ff:ff:ff
   inet 192.168.10.19/24 brd 192.168.10.255 scope global dynamic noprefixroute enp2s0
       valid_lft 1620sec preferred_lft 1620sec
   inet6 fe80::7d4c:299c:f68d:bbf7/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
3: docker0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default
   link/ether be:17:6c:47:ce:9d brd ff:ff:ff:ff:ff:ff
   inet 172.17.0.1/16 brd 172.17.255.255 scope global docker0
       valid_lft forever preferred_lft forever
petik-04@petik-05:~$ ping google.com
PING forcesafesearch.google.com (216.239.38.120) 56(84) bytes of data:
64 bytes from any-in-2678.1e100.net (216.239.38.120): icmp_seq=1 ttl=245 time=18.8 ms
64 bytes from any-in-2678.1e100.net (216.239.38.120): icmp_seq=2 ttl=245 time=19.2 ms
64 bytes from any-in-2678.1e100.net (216.239.38.120): icmp_seq=3 ttl=245 time=18.9 ms
^C
--- forcesafesearch.google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2002ms
rtt min/avg/max/mdev = 18.798/18.973/19.190/0.162 ms
petik-04@petik-05:~$
```

TEKNISI tidak bisa melakukan Ping/Akses ke ADMIN

```
Terminal
petik-04@petik-05:~$ ping 192.168.10.19
PING 192.168.10.19 (192.168.10.19) 56(84) bytes of data.
From 192.168.88.252 icmp_seq=1 Destination Host Unreachable
^C
--- 192.168.10.19 ping statistics ---
2 packets transmitted, 0 received, +1 errors, 100% packet loss, time 1000ms

petik-04@petik-05:~$
```

Hasil Dari VLAN 30 HOTSPOT :Mendapatkan Ip 192.168.30.39/24

