# MODUL PRAKTIKUM 06 STATIC ROUTING LINUX

## TUJUAN

Setelah praktikum dilaksanakan, peserta praktikum diharapkan memiliki kemampuan

- 1. Melakukan konfigurasi Static Routing dengan text-mode pada Router Linux Ubuntu 8.10
- 2. Melakukan konfigurasi Static Routing dengan GUI-mode pada Router Linux Ubuntu 8.10
- 3. Melakukan penelusuran jaringan dengan tracert dan mtr

#### PERANGKAT

Perangkat yang digunakan untuk praktikum adalah sbb :

- 1. Linux Ubuntu 8.10
- 2. Windows XP
- 3. Kabel UTP Straight atau Cross
- 4. Switch

### **PROSEDUR PRAKTIKUM**

Berikut topologi yang akan dijadikan materi praktikum :



- 1. Melakukan konfigurasi Static Routing dengan text-mode pada Linux Ubuntu 8.10
  - a. Tambahkan IP Address pada interface yang sesuai

Σ	root@ubuntu: /	ı ×
<u>F</u> ile	<u>E</u> dit ⊻iew <u>T</u> erminal <u>T</u> abs <u>H</u> elp	
root@ eth0	Aubuntu:/# ifconfig Link encap:Ethernet HWaddr 08:00:27:7a:01:91 inet addr:192.168.1.100 Bcast:192.168.1.255 Mask:255.255.255.0 inet6 addr: fe80::a00:27ff:fe7a:191/64 Scope:Link UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:672 errors:3 dropped:0 overruns:0 frame:0 TX packets:82 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:85436 (85.4 KB) TX bytes:26369 (26.3 KB) Interrupt:10 Base address:0xd020	
eth1	Link encap:Ethernet HWaddr 08:00:27:33:88:d0 inet addr:192.168.2.1 Bcast:192.168.2.255 Mask:255.255.255.0 inet6 addr: fe80::a00:27ff:fe33:88d0/64 Scope:Link UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:685 errors:2 dropped:0 overruns:0 frame:0 TX packets:96 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:87703 (87.7 KB) TX bytes:18743 (18.7 KB) Interrupt:9 Base address:0xd240	

b. Hidupkan service Routing (ip\_forwarding) dengan perintah
 "echo 1 > /proc/sys/net/ipv4/ip\_forward"

	root@ubuntu: /	_ <b>_ X</b>
<u>F</u> ile <u>E</u> dit ⊻ie	w <u>T</u> erminal <u>T</u> abs <u>H</u> elp	
root@ubuntu:/ 0	# more /proc/sys/net/ipv4/ip_forward	2
root@ubuntu:/ root@ubuntu:/ 1	<pre># echo 1 &gt; /proc/sys/net/ipv4/ip_forward # more /proc/sys/net/ipv4/ip_forward</pre>	
root@ubuntu:/	#	

c. Cek routing table dengan perintah "**route -n**" atau "**netstat -nr**"

					root@ubuntu: /						×
<u>F</u> ile	<u>E</u> dit	⊻iew	<u>T</u> erminal	<u>T</u> abs	<u>H</u> elp						
root( Kerne	@ubunt el TP	u:/# routi	route -n ng table								^
Dest	inatio	n	Gateway		Genmask	Flags	Metric	Ref	Use	Iface	
192.1	168.2. 168.1.	0 0	0.0.0.0		255.255.255.0 255.255.255.0	U U	0 0	0 0	0 0	eth1 eth0	
root(	@ubunt	u:/#									

d. Tambahkan route ke network yang belum dikenal dengan perintah
 "route add -net <destination-network/prefix> gw <gateway>"

atau "route add -net <dest-network> netmask <dest-subnet> gw <gateway>"

					root@ubu	ntu: /						
<u>F</u> ile	<u>E</u> dit	<u>∨</u> iew	<u>T</u> erminal	Tabs	<u>H</u> elp							
root@	ubunt	tu:/#	route add	-net	192.168.3.	0/24 gw	192.1	68.2.2				^
root@	pubunt	tu:/#	route -n									
Kerne	el IP	routi	.ng table									
Desti	natio	on	Gateway		Genmask		Flags	Metric	Ref	Use	Iface	
192.1	.68.3.	. 0	192.168.	2.2	255.255.	255.0	UG	0	Θ	0	eth1	
192.1	.68.2.	. 0	0.0.0.0		255.255.	255.0	U	0	Θ	Θ	eth1	
192.1	68.1.	. 0	0.0.0.0		255.255.	255.0	U	0	Θ	Θ	eth0	
root@	ubunt	tu:/#										

e. Jika terjadi kesalahan penambahan, dapat dihapus menggunakan perintah **"route del -net <destination-network/prefix>"** 

atau <b>route dei -net <dest-network> netmask <dest-subnet></dest-subnet></dest-network></b>	atau	"route del -	net <dest-netwo< th=""><th>ork&gt; netmask</th><th><dest-subnet>"</dest-subnet></th></dest-netwo<>	ork> netmask	<dest-subnet>"</dest-subnet>
--	------	--------------	--	--------------	------------------------------

				root@ubur	ntu: /					_	×
<u>F</u> ile <u>E</u> dit ⊻	iew ]	[erminal	Tabs	<u>H</u> elp							
root@ubuntu:	/# ne	etstat -	nr								^
Kernel IP ro	uting	, table									
Destination	0	ateway		Genmask		Flags	MSS	Window	irtt	Iface	
192.168.3.0	1	92.168.	2.2	255.255.2	255.0	UG	Θ	Θ	Θ	eth1	
192.168.2.0	0	0.0.0.0		255.255.2	255.0	U	Θ	Θ	Θ	eth1	
192.168.1.0	6	0.0.0.0		255.255.2	255.0	U	Θ	Θ	Θ	eth0	
root@ubuntu:	/# ro	oute del	-net	192.168.3.0	9/24						
root@ubuntu:	/# rc	oute -n									
Kernel IP ro	uting	, table									
Destination	0	ateway		Genmask		Flags	Metric	: Ref	Use	Iface	
192.168.2.0	6	0.0.0.0		255.255.2	255.0	U	Θ	Θ	Θ	eth1	
192.168.1.0	6	0.0.0.0		255.255.2	255.0	U	Θ	0	Θ	eth0	

- 2. Melakukan konfigurasi Static Routing dengan GUI-mode pada Router Linux Ubuntu 8.10
  - a. Hidupkan service Routing (ip\_forwarding) dengan perintah
    - "echo 1 > /proc/sys/net/ipv4/ip\_forward"

	root@ubuntu: /	X
<u>F</u> ile <u>E</u> dit	⊻iew <u>T</u> erminal <u>T</u> abs <u>H</u> elp	
root@ubun 0	tu:/# more /proc/sys/net/ipv4/ip_forward	7
root@ubun root@ubun 1 root@ubun	<pre>tu:/# echo 1 &gt; /proc/sys/net/ipv4/ip_forward tu:/# more /proc/sys/net/ipv4/ip_forward tu:/#</pre>	

b. Pasang IP Address menggunakan GUI-mode dengan mengakses menu **System—Preferences—** Network Configuration

	Ne	twork Connections		
💂 Wired 💂	Wireless	Mobile Broadband	😗 VPN	🛃 DSL
Auto eth1		ne	ver 🗧	⊨ <u>A</u> dd
Auto eth0		ne	ver	≥Eqlit
			9	Delete
				Close

í

c. Tambahkan IP Address dan Subnet Mask pada bagian IPv4 Settings

<u>10</u>	Editing Auto eth0	🚊 Editing Auto eth1	×
Connection <u>n</u> ame:	Auto eth0	Connection name: Auto eth1	]
🗹 Connect <u>a</u> utom	atically	🗹 Connect <u>a</u> utomatically	
🗹 System setting		🗹 System setting	
Wired 802.1x Secu	urity IPv4 Settings	Wired 802.1x Security IPv4 Settings	
Method: Manual		Method: Manual	
Addresses		Addresses	
Address 192.168.3.100	Netmask Gateway 255.255.255.0 0.0.0.0	Address Netmask Gateway 192.168.2.2 255.255.0 0.0.0.0 Control Control Contro	
DNS Servers:		DNS Servers:	
Search Domains	3:	Search Domains:	
DHCP Client ID:		DHCP Client ID:	
<i>u.</i>	Koutes	X Routes	
	Cancel C	Cancel 🗸 🖉	]

d. Tambahkan Static Route pada interface yang membutuhkan

Editing Auto eth1	×					
Connection name: Auto eth1						
🗹 Connect <u>a</u> utomatically						
🗹 System setting						
Wired 802.1x Security IPv4 Settings	_					
Method: Manual 🗸						
Addresses						
Address Netmask Gateway 🕂 Add						
192.168.2.2 255.255.0 0.0.0.0		5	Editing I	Pv4 routes fo	r Auto eth 1	
		Address	Prefix	Gateway	Metric	- Add
		192.168.1.0	24	192.168.2.1	0	
DNS Servers:						Delete
Search Domains:						
DHCP Client ID:						
			matically	obtained routes		
🔀 Routes			matically	oocumen routes		
Cancel 4 OK				[	8 <u>C</u> ancel	<b>⇔</b> и

e. Jalankan konfigurasi dengan Disable/Enable Networking



f. Cek routing table dengan perintah "route -n" atau "netstat -nr"

					root@ubun	tu: /					- [	IX
<u>F</u> ile	<u>E</u> dit	<u>∨</u> iew	<u>T</u> erminal	<u>T</u> abs	<u>H</u> elp							
root@ Kerne	@ubunt el IP	u:/# routi	route -n ng table									^
Desti	inatio	n	Gateway		Genmask		Flags	Metric	Ref	Use	Iface	
192.1	L68.3.	Θ	0.0.0.0		255.255.2	55.0	U	1	Θ	Θ	eth0	
192.1	168.2.	Θ	0.0.0.0		255.255.2	55.0	U	1	Θ	0	eth1	
192.1	L68.1.	0	192.168.	2.1	255.255.2	55.0	UG	0	Θ	0	eth1	
root@	gubunt	u:/#										

#### 3. Melakukan penelusuran jaringan dengan tracert dan mtr

a. Proses penelusuran jaringan dapat dilakukan dengan perintah tracert pada Windows XP (boleh ditambahkan dengan opsi –d : Do not resolve addresses to hostnames)



- b. Penelusuran jaringan menggunakan mtr pada Linux Ubuntu 8.10
  - i. Pasang IP Address dan Gateway yang sesuai sebelum menjalankan mtr

		root@ubuntu: /				_		×			
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> ermi	nal <u>T</u> abs	<u>H</u> elp									
root@ubuntu:/# ifcon	fiq eth0	192.168.3.1/24						^			
root@ubuntu:/# ifcon	fig eth0										
eth0 Link encap	:Ethernet	HWaddr 08:00:27	:7a:01:	91		_					
<pre>inet addr:192.108.3.1 BCast:192.108.3.255 Mask:255.255.255.0 inet6 addr: fe80a00.27ff.fe7a.101/64 Scope.Link</pre>											
	Inet6 addr: fe80::a00:27ff:fe7a:191/64 Scope:Link										
RX packets	UP BRUADCAST RUNNING MULIICAST MIU:1500 METRIC:1 RX packets:1711 errors:3 dropped:0 overrups:0 frame:0										
TX packets	:266 erro	rs:0 dropped:0 ov	erruns:	0 carri	er:0						
collisions	:0 txqueu	elen:1000									
RX bytes:2	93234 (20	3.2 KB) TX bytes	:47407	(47.4 K	B)						
Interrupt:	10 Base a	ddress:0xd020									
root@ubuntu·/# route	add defa	ult aw 192 168 3	100								
root@ubuntu:/# route	-n	att gw 152.100.5.	100								
Kernel IP routing ta	ble										
Destination Gate	way	Genmask	Flags	Metric	Ref Us	se Ifa	ice				
192.168.3.0 0.0.	9.0	255.255.255.0	U	Θ	Θ	0 eth	0				
0.0.0.0 192.	168.3.100	0.0.0.0	UG	Θ	Θ	0 eth	0				
root@ubuntu:/#											
								Ξ			
								~			

ii. Jalankan mtr dengan **"mtr <destination-ip>"** (mtr dapat dihentikan dengan ctrl+c)

root@ubuntu: /								×
<u>F</u> ile <u>E</u> dit ⊻iew <u>T</u> erminal <u>T</u> abs <u>H</u> elp								
root@ubuntu:/# <mark>mtr 192.168.1.1</mark>								^
My traceroute [vθ.73]								
ubuntu (0.0.0.0)			Mo	on Mar	22 17	:57:57	7 2010	
Keys: Help Display mode Resta	rt statis	tics	Order o	of fie	lds	quit		
	Packets		Pings					
Host	Loss%	Snt	Last	Avg	Best	Wrst	StDev	
1. 192.168.3.100	0.0%	4	0.0	0.0	0.0	0.0	0.0	
2. 192.168.2.1	0.0%	4	8.0	3.0	0.0	8.0	3.8	
3. 192.168.1.1	0.0%	4	4.0	2.0	0.0	4.0	2.3	