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# IMPLEMENTASI SNMP MENGGUNAKAN SIMULASI CISCO PACKET TRACER DENGAN ROUTING RIP



**SNMP** adalah sebuah protokol yang dirancang untuk memberikan kemampuan kepada pengguna untuk memantau dan mengatur jaringan komputernya secara sistematis dari jarak jauh atau dalam satu pusat kontrol saja. Pengolahan ini dijalankan dengan menggumpulkan data dan melakukan penetapan terhadap variabel-variabel dalam elemen jaringan yang dikelola.

#### **Elemen-elemen SNMP**

- Manajer adalah pelaksana dan manajemen jaringan. Pada kenyataannya manager ini merupakan komputer biasa yang ada pada jaringan yang mengoperaksikan perangkat lunak untuk manajemen jaringan. Manajer ini terdiri atas satu proses atau lebih yang berkomunikasi dengan agen-agennya dan dalam jaringan. Manajer akan mengumpulkan informasi dari agen dari jaringan yang diminta oleh administrator saja bukan semua informasi yang dimiliki agen.
- MIB atau Manager Information Base, dapat dikatakan sebagai struktur basis data variabel dari elemen jaringan yang dikelola. Struktrur ini bersifat hierarki dan memiliki aturan sedemikian rupa sehingga informasi setiap variabel dapat dikelola atau ditetapkan dengan mudah.

Pada kesempatan kali ini, penulis diberikan sebuah percobaan dimana diberikan 3 buah Router, 30 buah Personal Computer, 3 buah Server, dan 3 buah Switch.

Berikut topologi yang telah dibuat :



Berdasarkan topologi diatas, rincian IP address yang dialokasikan adalah sebagai berikut :

- 10 PC di SNMP Router 1 IP address = 192.168.1.0/24 ; Gateway = 192.168.1.1
- 10 PC di SNMP Router 2 IP address = 192.168.2.0/24 ; Gateway = 192.168.2.1
- 10 PC di SNMP Router 3 IP address = 192.168.3.0/24 ; Gateway = 192.168.3.1
- Server 0 IP address = 192.168.1.99 ; Gateway = 192.168.1.1
- Server 1 IP address = 192.168.2.99 ; Gateway = 192.168.2.1
- Server 2 IP address = 192.168.3.99 ; Gateway = 192.168.3.1
- Network antara SNMP Router 1 dan SNMP Router 2 IP address : 10.10.10.0/30
- Network antara SNMP Router 2 dan SNMP Router 3 IP address : 10.10.20.0/30

Setelah dilakukan konfigurasi IP address pada masing-masing perangkat, maka dilakukanlah proses routing dimana disini penulis menggunakan routing RIP.

#### **SNMP Router 1**

```
SNMPROUTER1>enable
SNMPROUTER1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
SNMPROUTER1(config)#router rip
SNMPROUTER1(config-router)#network 192.168.1.0
SNMPROUTER1(config-router)#network 10.10.10.0
```

#### **SNMP Router 2**

```
SNMPROUTER2>enable
SNMPROUTER2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
SNMPROUTER2(config)#router rip
SNMPROUTER2(config-router)#network 192.168.2.0
SNMPROUTER2(config-router)#network 10.10.10.0
SNMPROUTER2(config-router)#network 10.10.20.0
```

```
SNMPROUTER3>enable
SNMPROUTER3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
SNMPROUTER3(config)#router rip
SNMPROUTER3(config-router)#network 192.168.3.0
SNMPROUTER3(config-router)#network 10.10.20.0
```

Setelah konfigurasi routing RIP telah dilakukan, selanjutnya adalah melakukan proses PING dengan IP yang berbeda subnet untuk mengetahui apakah routing RIP yang dilakukan berhasil.



Ping dari IP 192.168.1.2 ke IP 192.168.2.2



Ping dari IP 192.168.1.2 ke IP 192.168.3.2

Dari gambar tersebut diatas, dapat dipastikan bahwa routing yang dilakukan yaitu routing RIP telah berhasil dilakukan dan selanjutnya adalah mengkonfigurasi SNMP pada tiap-tiap Router. Berikut konfigurasi nya :

#### **SNMP Router 1**

```
SNMPROUTER1>enable
SNMPROUTER1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
SNMPROUTER1(config)#snmp-server community public ro
SNMPROUTER1(config)#snmp-server community private rw
```

#### **SNMP Router 2**

```
SNMPROUTER2>enable
SNMPROUTER2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
SNMPROUTER2(config)#snmp-server community public ro
SNMPROUTER2(config)#snmp-server community private rw
```

SNMPROUTER3>enable
SNMPROUTER3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
SNMPROUTER3(config)#snmp-server community public ro
SNMPROUTER3(config)#snmp-server community private rw

Pada perangkat Cisco, untuk mengaktifkan snmp menggunakan perintah snmp-server community <community string> ro/rw

RO : Read Only, menggunakan community string public (atau string apa saja)

RW : Read Write , menggunakan community string private (atau string apa saja)

Langkah terakhir adalah melakukan pengujian, disini penulis hanya memberikan contoh pada satu buah PC yaitu yang berada dijaringan IP 192.168.1.0/24 dan dengan satu buah PC tersebut akan melakukan SNMP Router 1, 2 serta 3 karena ketiga router tersebut telah diaktifkan fitur SNMPnya.

Reference Advanced			9	23
Address	10.10.10.1			
Port	161			
Read Community	•••••			
Write Community	•••••			
SNMP Version	v3			•
0	к	Cancel		

Konfigurasi MIB pada PC 192.168.1.0/24

Address = Diisi dengan IP Address SNMP Router 1 (10.10.10.1); SNMP Router 2 (10.10.10.2); SNMP Router 3 (10.10.20.1)

Port = Yaitu port khusus untuk protol TCP/UDP dan service SNMP (161)

Read Community = public

Write Community = private

SNMP Version = v3

### **SNMP Router 1**

ddress:	10.10.10.1		OID:		.1.3.6.1.2.1.1.5.0		
Ac	dvanced		Operations:		Get	•	GO
NMP MIBs	Res	ult Table					
4 MIB Tree		Name/OID			Value		Туре
<ul> <li>router_std MIBs</li> <li>iso</li> <li>.org</li> </ul>	.1.3.6. (.iso.or)	1.2.1.1.5.0 g.dod.internet.mgmt.mib-2.systen	n.sysName.0)	SNMPROUTER1		OctetString	
<ul> <li>internet</li> <li>.mgmt</li> <li>.mgb-2</li> <li>.mb-2</li> <li>.system</li> </ul>	escr bjectID pTime ontact ame cotation s Name :				.sysName		
⊳.opf ⊳.opf ⊳.rip2	OID :				.1.3.6.1.2.1.1.5.0		
<ul> <li>.private</li> <li>router_advip MIBs</li> </ul>	Syntax	:					
<ul> <li>switch_L2 MIBs</li> <li>switch_multiLayer MIBs</li> </ul>	Access	:					
	Descrip	tion :					

#### SysName SNMP Router 1

Advanced	Operations:		Get	•	60
	Result Table				00
	Name/OID		Value		Type
	.1.3.6.1.2.1.2.2.1.2.1 (.iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEn	try.i Vlan1		OctetString	
a .org a .dod a .internet a .mgmt	.1.3.6, 1.2.1, 2.2.1, 2.2 (.iso.org.dod.internet.mgmt.mb-2.interfaces.ifTable.ifEn	try.i FastEthernet0/0		OctetString	
	.1.3.6.1.2.1.2.2.1.2.3 (.iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEn	try.i FastEthernet0/1	FastEthernet0/1		
	.1.3.6.1.2.1.2.2.1.2.4 (.iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEn	try.i Serial0/0/0	Serial0/0/0		
sDescr sObjectID	.1.3.6.1.2.1.2.2.1.2.5 (.iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.i Serial0/0/1			OctetString	
sUpTime E sContact					
sLocation					
umber	Name :		.ifDescr		
.ifEntry	OID :		.1.3.6.1.2.1.2.2.1.2		
.ifDescr	Syntax :				
.iffMtu	Access :				
.ifSpeed .ifPhysAddress	Description :				
.ifAdminStatus .ifOperStatus					
	Descr GOIjectID UjoTime Contact Name Location ces umber able ifEntry .ifEntr	(cso.org.dod.internet.mgmt.mb-2.interfaces.iff.abie.iffin (1-3.6.6.12.12.2.12.3)     (cso.org.dod.internet.mgmt.mb-2.interfaces.iff.abie.iffin (1-3.6.12.12.2.12.12.12.12.12.12.12.12.12.12.1	Class originations of the second	Les or doditernet.mgmt.mb-2.interfaces.if abie.iternty.i Descr (iso org.doditernet.mgmt.mb-2.interfaces.if abie.itEntry.i Serai0/0/0 Li.3.6.1.2.1.2.2.1.2 Soria0.0/0 Li.3.6.1.2.1.2.2.1.2 Soria0.0/0 Li.3.6.1.2.1.2.2.1.2 Soria0.0/0 Li.3.6.1.2.1.2.2.1.2 Soria0.0/0	Uso or god. Internet.mgnt.mb-2.interfaces.if abe.interty.i     FastEthernet/1     Octentstring       Uso or god. Internet.mgnt.mb-2.interfaces.if abe.interty.i     Serial0/0/0     Octentstring       Uso or god. Internet.mgnt.mb-2.interfaces.if abe.interty.i     Serial0/0/1     Octentstring       Uso or god. Internet.mgnt.mb-2.interfaces.if abe.interty.i     Serial0/0/1     Octentstring       Uso or god. Internet.mgnt.mb-2.interfaces.if abe.interty.i     Serial0/0/1     Octentstring       Uso or god.internet.mgnt.mb-2.interfaces.if abe.interty.i     Serial0/0/1     Octentstring       Uso or god.internet.mgnt.mb-2.interfaces.if abe.interty.i     Serial0/0/1     Octentstring       Uso or god.internet.mgnt.mb-2.interfaces.if abe.interty.i     Serial0/0/1     Octentstring       Manne :

.iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.ifDescr

Informasi SNMP Router 1

ddress:	10.10.10.1		OID:		.1.3.6.1.2	1.4.21.1.7		
	Advanced		Operations:	(	Get		•	GO
SNMP MIBs		<ul> <li>Result Table</li> </ul>						
	.sysName		Name/OID		Va	lue		Туре
	.sysLocation .interfaces	.1.3.6.1.2.1.4.2 (.iso.org.dod.inte	1.1.7.10.10.10.0 ernet.mgmt.mib-2.ip.ipRouteTable.ipRou	0.0.0.0			IpAddress	
	.ifNumber 4 .ifTable	.1.3.6.1.2.1.4.2 (.iso.org.dod.inte	1.1.7.10.10.20.0 ernet.mgmt.mib-2.ip.ipRouteTable.ipRou	10.10.10.2			IpAddress	
	<ul> <li>.ifEntry</li> <li>.ifIndex</li> </ul>	.1.3.6.1.2.1.4.2 (.iso.org.dod.inte	1.1.7.192.168.1.0 ernet.mgmt.mib-2.ip.ipRouteTable.ipRou	0.0.0.0			IpAddress	
	.ifDescr .ifType	.1.3.6.1.2.1.4.2 (.iso.org.dod.inte	1.1.7.192.168.2.0 ernet.mgmt.mib-2.ip.ipRouteTable.ipRou	10.10.10.2			IpAddress	
	.ifMtu .ifSpeed	.1.3.6.1.2.1.4.2 (.iso.org.dod.inte	1.1.7.192.168.3.0 ernet.mgmt.mib-2.ip.ipRouteTable.ipRou	10.10.10.2			IpAddress	
	.ifPhysAddress .ifAdminStatus							
	.ifOperStatus ⊿ .ip							
	<ul> <li>.ipRouteTable</li> <li>.ipRouteEntry</li> </ul>	Name :				.ipRouteNextHop		
	.ipRouteDest .ipRouteIfIndex	OID :				.1.3.6.1.2.1.4.21.1.7		
	.ipRouteMetric1 .ipRouteMetric2	Syntax :						
	.ipRouteMetric3 .ipRouteMetric4	Access :						
	.ipRouteAge	Description :						
	.ipRouteMask .ipRouteMetric5							
	⊳ .rip2							



IB Browser						
Address: 10.1	0.10.2	OID:		.1.3.6.1.2.1.1.5.0		
Advanced		Operations:		Get	•	GO
SNMP MIBs	Result Table					
4 MIB Tree	Name/OID		Valu	Je		Type
<ul> <li>router_std MIBs</li> <li>iso</li> <li>org</li> </ul>	.1.3.6.1.2.1.1.5.0 (.iso.org.dod.internet.mgmt.mib-2.system.sy	ysName.0)	SNMPROUTER2		OctetString	
<ul> <li>internet         <ul> <li>.mpnt</li> <li>.mb-2</li> <li>.system</li> <li>.system</li> <li>.systop</li> <li>.systop</li> <li>.systom</li> <li>.systom</li> <li>.systom</li> <li>.systom</li> <li>.systom</li> <li>.systom</li> <li>.systom</li> </ul> </li> </ul>	Name :			.sysName		
▷ .ospf ▷ .rip2	OID :			.1.3.6.1.2.1.1.5.0		
▷ .private ▷ router_advip MIBs	Syntax :					
▷ switch_L2 MIBs▷ switch_multiLayer MIBs	Access :					
	Description :					

SysName SNMP Router 2

dress:	10, 10, 10, 2		OID:					
	Advaged		Operations:		Get	<b>_</b>	60	
	Advancern		operations.					
VMP MIBs	*	Result Table						
MIB Tree		Na	me/OID		Value		Туре	
4 router_std MIBs 4 .iso		.1.3.6.1.2.1.2.2.1.2.1 (.iso.org.dod.internet.mgmt.	mib-2.interfaces.ifTable.ifEntry	Vlan 1		OctetString		
⊿ .org ⊿ .dod		.1.3.6.1.2.1.2.2.1.2.2 (.iso.org.dod.internet.mgmt.	mib-2.interfaces.ifTable.ifEntry	FastEthernet0/0		OctetString		
4 .inter 4 .r	net mgmt	.1.3.6.1.2.1.2.2.1.2.3 (.iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry		FastEthernet0/1		OctetString		
⊿ .mib-2 ⊿ .system	.1.3.6.1.2.1.2.2.1.2.4 (.iso.org.dod.internet.mgmt.	.1.3.6.1.2.1.2.2.1.2.4 (.iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry		Serial0/0/0				
	.sysDescr .sysObjectID	.1.3.6.1.2.1.2.2.1.2.5 (.iso.org.dod.internet.mgmt.	.2.5 net.mgmt.mib-2.interfaces.ifTable.ifEntry Serial0/0/1			OctetString		
	.sysUpTime sysContact .sysName							
	.sysLocation .interfaces .ifNumber	Name :			.ifDescr			
	<ul> <li>4 .ifTable</li> <li>4 .ifEntry</li> </ul>	OID :	OID :			.1.3.6.1.2.1.2.2.1.2		
	.ifIndex .ifDescr	Syntax :						
	.ifType .ifMtu	Access :						
	.ifPhysAddress .ifAdminStatus	Description :						
	.ifOperStatus ▷ .ip ▷ .ospf							

Informasi SNMP Router 2

ldress:	10.10.2	10.10.10.2		OID: .1.3.6.1.2.1.4.21.1.7		2.1.4.21.1.7			
	Advanced		Operations:		Get		•	GO	
NMP MIBs		Result Table							
	.sysDescr		Name/OID		Valu	ue		Туре	
	.sysObjectID .sysUpTime	.1.3.6.1.2.1.4.21.1. (.iso.org.dod.interne	7.10.10.10.0 t.mgmt.mib-2.ip.ipRouteTable.ipRout	0.0.0.0			IpAddress		
	.sysContact .sysName	.1.3.6.1.2.1.4.21.1. (.iso.org.dod.interne	7.10.10.20.0 t.mgmt.mib-2.ip.ipRouteTable.ipRout	0.0.0.0			IpAddress		
	.sysLocation  .interfaces	.1.3.6.1.2.1.4.21.1. (.iso.org.dod.interne	7.192.168.1.0 t.mgmt.mib-2.ip.ipRouteTable.ipRout	10.10.10.1			IpAddress		
	.ifVumber .ifTable	.1.3.6.1.2.1.4.21.1. (.iso.org.dod.interne	7.192.168.2.0 t.mgmt.mib-2.ip.ipRouteTable.ipRout	0.0.0.0			IpAddress		
	<ul> <li>.ifEntry</li> <li>.ifIndex</li> </ul>	.1.3.6.1.2.1.4.21.1. (.iso.org.dod.internet	7.192.168.3.0 t.mgmt.mib-2.ip.ipRouteTable.ipRout	10.10.20.2			IpAddress		
.ifDescr .ifType .ifMtu ≣									
	.ifPhysAddress .ifAdminStatus	Name :	Name :		.ipRouteNextHop				
.ifOperStatus 4 .ip		OID :	OID :		.1.3.6.1.2.1.4.21.1.7				
	<ul> <li>.ipRouteTable</li> <li>.ipRouteEntry</li> </ul>	Syntax :							
	.ipRouteDest .ipRouteIfIndex	Access :							
	.ipRouteMetric1 .ipRouteMetric2 .ipRouteMetric3	Description :							
	.ipRouteMetric4 .ipRouteNextHop .ipRouteAge								

Informasi NextHop SNMP Router 2

MIB Browser								X
Address:	10.10.20.2		OID:		.1.3.6.1.2	2.1.1.5.0		
	Advanced		Operations:		Get			GO
SNMP MIBs	Advanced	Result Table 1.3.6.1.2.1.1.5.0 (.iso.org.dod.interne Name : OID : Syntax : Access : Description :	Operations: Name/OID et.mgmt.mib-2.system.systame.0)	SIMPROUTER3	Valu	ue .sysName .1.3.6.1.2.1.1.5.0	OctetString	GO Type
	.ipRouteDest .ipRouteIfIndex ipRouteMetric1							
iso.org.dod.internet.mgmt.mib-2.sys	tem.sysName.0							



MIB Browser					х
Address: 10.1	10.20.2	OID:	.1.3	3.6.1.2.1.2.2.1.2	
Advanced		Operations:	Get	t	▼ GO
SNMP MIBs		Result Table			
⊿ .system		Name/OID		Value	Туре
.sysDescr .sysObjectID		.1.3.6.1.2.1.2.2.1.2.1 (.iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr	Vlan 1		OctetString
.sysUpTime .sysContact		.1.3.6.1.2.1.2.2.1.2.2 (.iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr	FastEthernet0/0		OctetString
.sysName .sysLocation		.1.3.6.1.2.1.2.2.1.2.3 (.iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr	FastEthernet0/1		OctetString
▲ .interfaces .ifNumber		.1.3.6.1.2.1.2.2.1.2.4 (.iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr	Serial0/0/0		OctetString
4 .ifTable 4 .ifEntry		.1.3.6.1.2.1.2.2.1.2.5 (.iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr	Serial0/0/1		OctetString
.ifDesc .ifDesc .ifType	x r =				
.ifMtu					
.irspee .ifPhys.	a Address	Name :		.ifDescr	
.irAdmii .ifOper	Status	OID :	OID :		
■ .ip ■ .ipRouteTable		Syntax :			
· .ipRouteEn	teDest	Access :			
.ipRout	teMetric1	Description :			
.ipRout	teMetric2 teMetric3				
.ipRout .ipRout	teMetric4 teNextHop				
.iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.	.ifDescr				
-	-				

Informasi SNMP Router 3

dress:	10.10.20.2		OID:		.1.3.6.1.2.1.4.21.1.7		
	Advanced		Operations:	[	Get	•	GO
		Decult Table					
MP MIBs	4 ifTable	Kebuit Table	News (OTD		Weble		T
⊿ .ifTable ⊿ .ifEntry .ifIndex		.1.3.6.1.2.1.4.21.1.7 (.iso.org.dod.internet	. 10. 10. 10.0 .mgmt.mib-2.ip.ipRouteTable.ipRout	10.10.20.1	Value	IpAddress	туре
	.ifDescr .ifType	.1.3.6.1.2.1.4.21.1.7 (.iso.org.dod.internet	. 10. 10. 20.0 .mgmt.mib-2.ip.ipRouteTable.ipRout	0.0.0.0		IpAddress	
	.ifMtu .ifSpeed	.1.3.6.1.2.1.4.21.1.7 (.iso.org.dod.internet	. 192. 168. 1.0 .mgmt.mib-2.ip.ipRouteTable.ipRout	10.10.20.1		IpAddress	
	.ifAdminStatus	.1.3.6.1.2.1.4.21.1.7 (.iso.org.dod.internet	. 192. 168. 2.0 .mgmt.mib-2.ip.ipRouteTable.ipRout	10.10.20.1		IpAddress	
	4 .ip	.1.3.6.1.2.1.4.21.1.7 (.iso.org.dod.internet	. 192. 168. 3.0 .mgmt.mib-2.ip.ipRouteTable.ipRout	0.0.0.0		IpAddress	
	<ul> <li>ipRouteTable</li> <li>ipRouteEntry</li> <li>ipRouteDest</li> <li>ipRouteIfIndex</li> </ul>						
	.ipRouteMetric1 .ipRouteMetric2	Name :			.ipRouteNextHop	5	
	.ipRouteMetric3 .ipRouteMetric4	OID :			.1.3.6.1.2.1.4.2	1.1.7	
	.ipRouteNextHop .ipRouteAge ipRouteMask	Syntax :					
	.ipRouteMetric5	Access :					
	<ul> <li>✓ .ospf</li> <li>&gt; .ospfGeneralGroup</li> <li>&gt; .ospfAreaTable</li> <li>&gt; .ospfLsdbTable</li> <li>&gt; .ospfNbrTable</li> </ul>	Description :					
	▷ .rip2	-					

Informasi NextHop SNMP Router 3