

MANAJEMEN JARINGAN



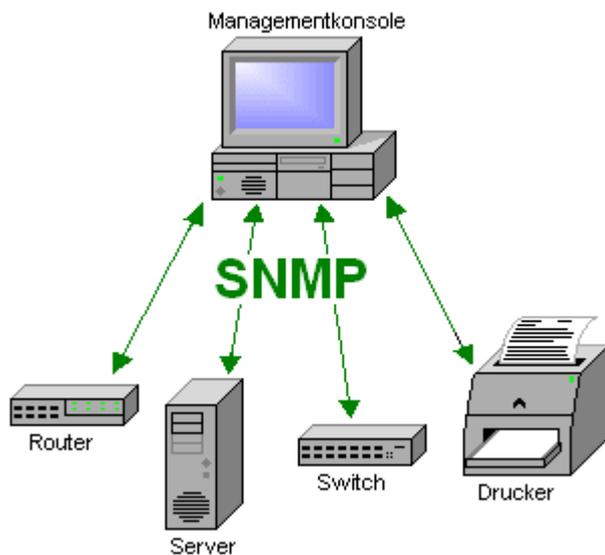
GONEWAJE

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**FAKULTAS ILMU KOMPUTER
JURUSAN SISTEM KOMPUTER
UNIVERSITAS SRIWIJAYA**

2017

IMPLEMENTASI SNMP MENGGUNAKAN SIMULASI CISCO PACKET TRACER DENGAN ROUTING RIP



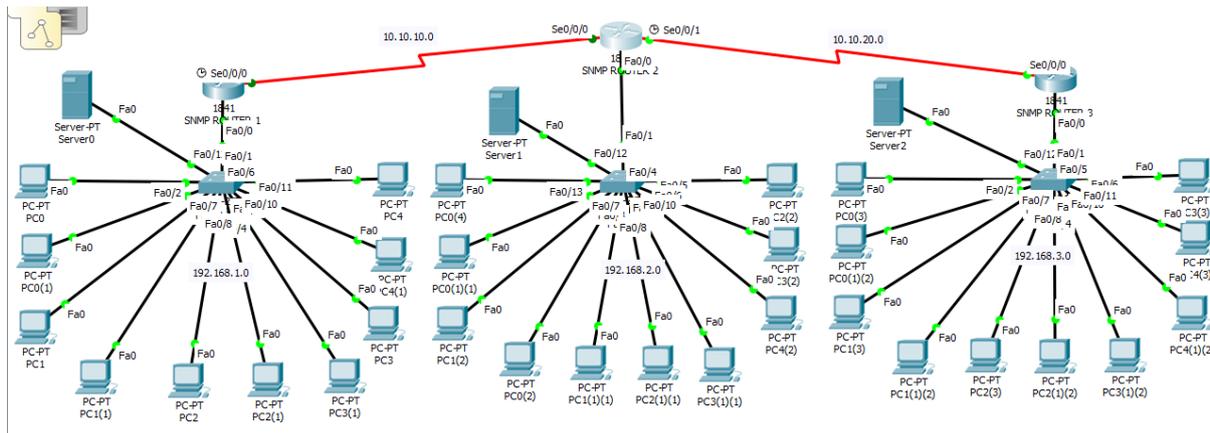
SNMP adalah sebuah protokol yang dirancang untuk memberikan kemampuan kepada pengguna untuk memantau dan mengatur jaringan komputernya secara sistematis dari jarak jauh atau dalam satu pusat kontrol saja. Pengolahan ini dijalankan dengan mengumpulkan data dan melakukan penetapan terhadap variabel-variabel 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 mengoperasikan perangkat lunak untuk manajemen jaringan. Manajer ini terdiri atas satu proses atau lebih yang berkomunikasi dengan agen-agenya 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. Struktur 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
```

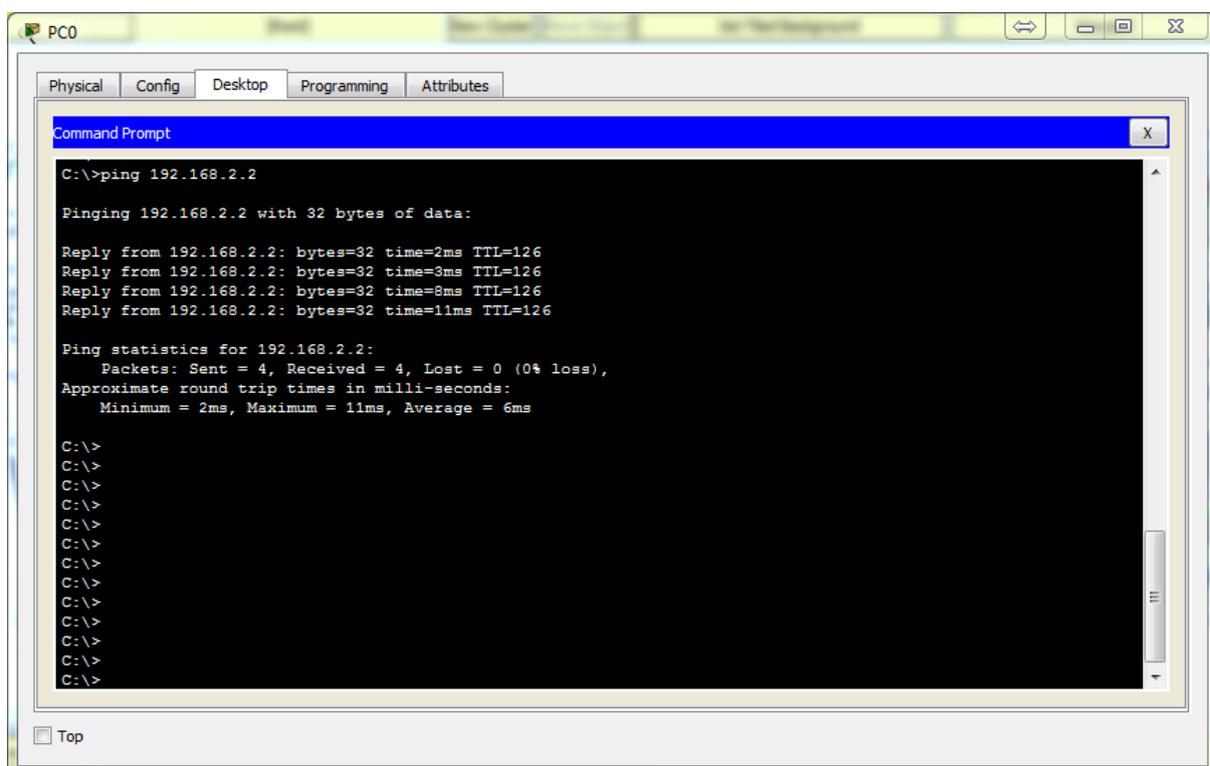
SNMP Router 2

```
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
```

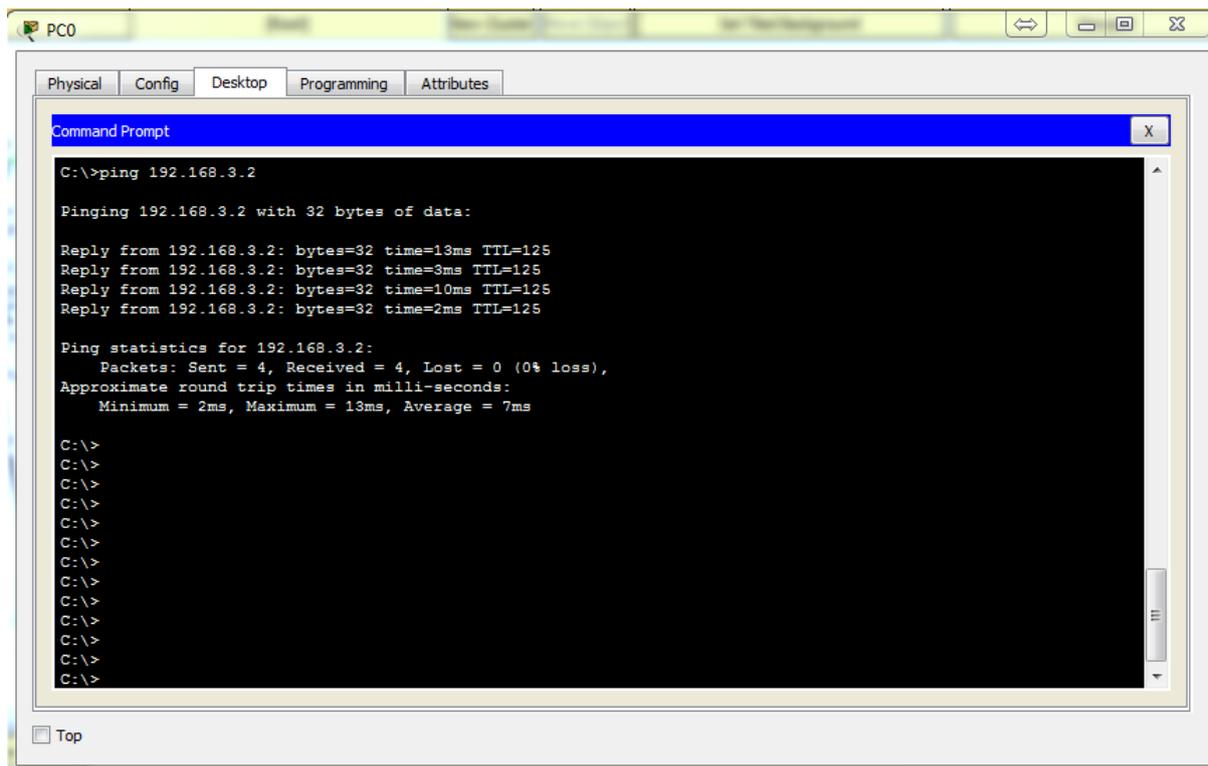
SNMP Router 3

```
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
```

SNMP Router 3

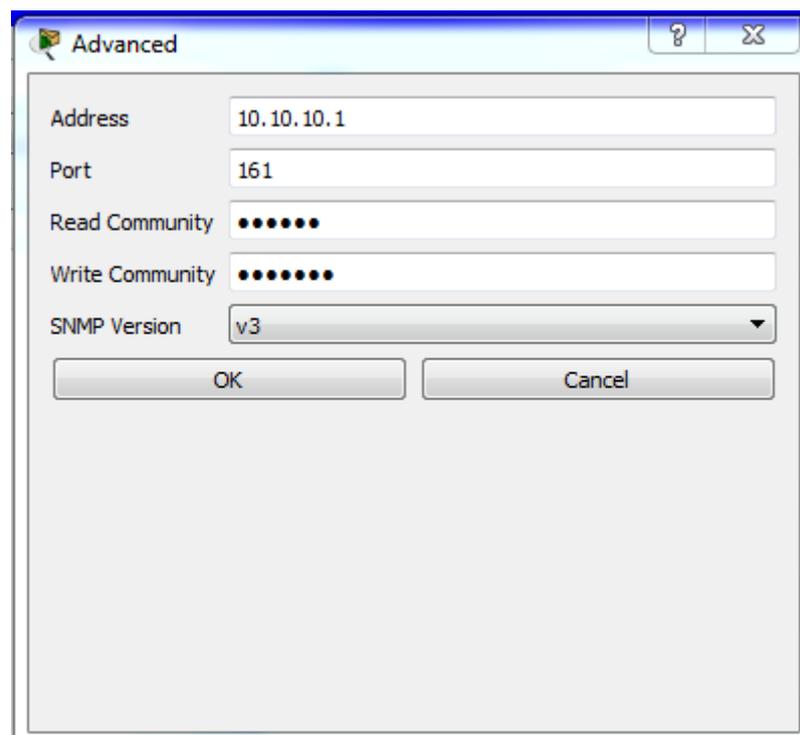
```
SNMPROUTER3>enable
SNMPROUTER3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
SNMPROUTER3(config)#snmp-server community public ro
SNMPROUTER3(config)#snmp-server community private rw
```

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 di jaringan 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.



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 protokol TCP/UDP dan service SNMP (161)

Read Community = public

Write Community = private

SNMP Version = v3

SNMP Router 1

MIB Browser

Address: 10.10.10.1 OID: .1.3.6.1.2.1.1.5.0

Operations: Get GO

Result Table

Name/OID	Value	Type
.1.3.6.1.2.1.1.5.0 (iso.org.dod.internet.mgmt.mib-2.system.sysName.0)	SNMPROUTER1	OctetString

SNMP MIBs

- MIB Tree
 - router_std MIBs
 - iso
 - .org
 - .internet
 - .mgmt
 - .mib-2
 - .system
 - .sysDescr
 - .sysObjectID
 - .sysUpTime
 - .sysContact
 - .sysName
 - .sysLocation
 - .interfaces
 - .ip
 - .ospf
 - .rip2
 - .private
 - router_advip MIBs
 - switch_L2 MIBs
 - switch_multiLayer MIBs

iso.org.dod.internet.mgmt.mib-2.system.sysName.0

SysName SNMP Router 1

MIB Browser

Address: 10.10.10.1 OID: .1.3.6.1.2.1.2.2.1.2

Operations: Get GO

Result Table

Name/OID	Value	Type
.1.3.6.1.2.1.2.2.1.2.1 (iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.i...	Vlan1	OctetString
.1.3.6.1.2.1.2.2.1.2.2 (iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.i...	FastEthernet0/0	OctetString
.1.3.6.1.2.1.2.2.1.2.3 (iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.i...	FastEthernet0/1	OctetString
.1.3.6.1.2.1.2.2.1.2.4 (iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.i...	Serial0/0/0	OctetString
.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

SNMP MIBs

- MIB Tree
 - router_std MIBs
 - iso
 - .org
 - .internet
 - .mgmt
 - .mib-2
 - .system
 - .sysDescr
 - .sysObjectID
 - .sysUpTime
 - .sysContact
 - .sysName
 - .sysLocation
 - .interfaces
 - .ifNumber
 - .ifTable
 - .ifEntry
 - .ifIndex
 - .ifDescr
 - .ifType
 - .ifMtu
 - .ifSpeed
 - .ifPhysAddress
 - .ifAdminStatus
 - .ifOperStatus
 - .ip
 - .ospf
 - .rip2

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

Informasi SNMP Router 1

MIB Browser

Address: 10.10.10.1 OID: .1.3.6.1.2.1.4.21.1.7

Advanced... Operations: Get GO

SNMP MIBs

- .sysName
- .sysLocation
- └─ interfaces
 - └─ ifNumber
 - └─ ifTable
 - └─ ifEntry
 - ifIndex
 - ifDescr
 - ifType
 - ifMtu
 - ifSpeed
 - ifPhysAddress
 - ifAdminStatus
 - ifOperStatus
 - └─ ip
 - └─ ipRouteTable
 - └─ ipRouteEntry
 - ipRouteDest
 - ipRouteIfIndex
 - ipRouteMetric1
 - ipRouteMetric2
 - ipRouteMetric3
 - ipRouteMetric4
 - ipRouteMetric5
 - ipRouteNextHop
 - ipRouteAge
 - ipRouteMask
 - ipRouteMetric5
- └─ .ospf
- └─ .ip2
- └─ .private

Result Table

| Name/OID | Value | Type |
|---|------------|-----------|
| .1.3.6.1.2.1.4.21.1.7.10.10.10.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRou...) | 0.0.0.0 | IpAddress |
| .1.3.6.1.2.1.4.21.1.7.10.10.20.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRou...) | 10.10.10.2 | IpAddress |
| .1.3.6.1.2.1.4.21.1.7.192.168.1.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRou...) | 0.0.0.0 | IpAddress |
| .1.3.6.1.2.1.4.21.1.7.192.168.2.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRou...) | 10.10.10.2 | IpAddress |
| .1.3.6.1.2.1.4.21.1.7.192.168.3.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRou...) | 10.10.10.2 | IpAddress |

iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRouteEntry.ipRouteNextHop

Name : ipRouteNextHop

OID : .1.3.6.1.2.1.4.21.1.7

Syntax :

Access :

Description :

Informasi NextHop SNMP Router 1

SNMP Router 2

MIB Browser

Address: 10.10.10.2 OID: .1.3.6.1.2.1.1.5.0

Advanced... Operations: Get GO

SNMP MIBs

- MIB Tree
 - └─ router_std MIBs
 - └─ .iso
 - └─ .org
 - └─ .dod
 - └─ .internet
 - └─ .mgmt
 - └─ .mib-2
 - └─ .system
 - .sysDescr
 - .sysObj...
 - .sysUp...
 - .sysCo...
 - .sysName
 - .sysLoc...
 - └─ .interfaces
 - └─ .id
 - └─ .ospf
 - └─ .ip2
 - └─ .private
 - └─ router_advip MIBs
 - └─ switch_L2 MIBs
 - └─ switch_multiayer MIBs

Result Table

| Name/OID | Value | Type |
|--|-------------|-------------|
| .1.3.6.1.2.1.1.5.0
(iso.org.dod.internet.mgmt.mib-2.system.sysName.0) | SNMPROUTER2 | OctetString |

iso.org.dod.internet.mgmt.mib-2.system.sysName.0

Name : sysName

OID : .1.3.6.1.2.1.1.5.0

Syntax :

Access :

Description :

SysName SNMP Router 2

MI B Browser

Address: 10.10.10.2 OID: .1.3.6.1.2.1.2.2.1.2

Advanced... Operations: Get GO

SNMP MIBs

- router_std MIBs
 - iso
 - .org
 - .dod
 - .internet
 - .mgmt
 - .mb-2
 - .system
 - .sysDescr
 - .sysObjectID
 - .sysUpTime
 - .sysContact
 - .sysName
 - .sysLocation
 - .interfaces
 - .ifNumber
 - .ifTable
 - .ifEntry
 - .ifIndex
 - .ifDescr
 - .ifType
 - .ifMtu
 - .ifSpeed
 - .ifPhysAddress
 - .ifAdminStatus
 - .ifOperStatus

Result Table

| Name/OID | Value | Type |
|--|-----------------|-------------|
| .1.3.6.1.2.1.2.2.1.2.1
(iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry....) | Vlan1 | OctetString |
| .1.3.6.1.2.1.2.2.1.2.2
(iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry....) | FastEthernet0/0 | OctetString |
| .1.3.6.1.2.1.2.2.1.2.3
(iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry....) | FastEthernet0/1 | OctetString |
| .1.3.6.1.2.1.2.2.1.2.4
(iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry....) | Serial0/0/0 | OctetString |
| .1.3.6.1.2.1.2.2.1.2.5
(iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry....) | Serial0/0/1 | OctetString |

Name : ifDescr

OID : .1.3.6.1.2.1.2.2.1.2

Syntax :

Access :

Description :

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

Informasi SNMP Router 2

MI B Browser

Address: 10.10.10.2 OID: .1.3.6.1.2.1.4.21.1.7

Advanced... Operations: Get GO

SNMP MIBs

- .sysDescr
- .sysObjectID
- .sysUpTime
- .sysContact
- .sysName
- .sysLocation
- .interfaces
 - .ifNumber
 - .ifTable
 - .ifEntry
 - .ifIndex
 - .ifDescr
 - .ifType
 - .ifMtu
 - .ifSpeed
 - .ifPhysAddress
 - .ifAdminStatus
 - .ifOperStatus
- .ip
 - .ipRouteTable
 - .ipRouteEntry
 - .ipRouteDest
 - .ipRouteIfIndex
 - .ipRouteMetric1
 - .ipRouteMetric2
 - .ipRouteMetric3
 - .ipRouteMetric4
 - .ipRouteNextHop
 - .ipRouteAge
 - .ipRouteMask

Result Table

| Name/OID | Value | Type |
|---|------------|-----------|
| .1.3.6.1.2.1.4.21.1.7.10.10.10.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRoute...) | 0.0.0.0 | IpAddress |
| .1.3.6.1.2.1.4.21.1.7.10.10.20.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRoute...) | 0.0.0.0 | IpAddress |
| .1.3.6.1.2.1.4.21.1.7.192.168.1.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRoute...) | 10.10.10.1 | IpAddress |
| .1.3.6.1.2.1.4.21.1.7.192.168.2.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRoute...) | 0.0.0.0 | IpAddress |
| .1.3.6.1.2.1.4.21.1.7.192.168.3.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRoute...) | 10.10.20.2 | IpAddress |

Name : ipRouteNextHop

OID : .1.3.6.1.2.1.4.21.1.7

Syntax :

Access :

Description :

iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRouteEntry.ipRouteNextHop

Informasi NextHop SNMP Router 2

SNMP Router 3

Address: 10.10.20.2 OID: .1.3.6.1.2.1.1.5.0
 Operations: Get GO

SNMP MIBs: .org, .dod, .internet, .mgmt, .mib-2, .system, .sysDescr, .sysObjectID, .sysUpTime, .sysContact, .sysName, .sysLocation, .interfaces, .ifNumber, .ifTable, .ifEntry, .ifIndex, .ifDescr, .ifType, .ifMtu, .ifSpeed, .ifPhysAddress, .ifAdminStatus, .ifOperStatus, .ip, .ipRouteTable, .ipRouteEntry, .ipRouteDest, .ipRouteIfIndex, .ipRouteMetric1

| Name/OID | Value | Type |
|--|-------------|-------------|
| .1.3.6.1.2.1.1.5.0
(iso.org.dod.internet.mgmt.mib-2.system.sysName.0) | SNMPROUTER3 | OctetString |

iso.org.dod.internet.mgmt.mib-2.system.sysName.0

SysName SNMP Router 3

Address: 10.10.20.2 OID: .1.3.6.1.2.1.2.2.1.2
 Operations: Get GO

SNMP MIBs: .system, .sysDescr, .sysObjectID, .sysUpTime, .sysContact, .sysName, .sysLocation, .interfaces, .ifNumber, .ifTable, .ifEntry, .ifIndex, .ifDescr, .ifType, .ifMtu, .ifSpeed, .ifPhysAddress, .ifAdminStatus, .ifOperStatus, .ip, .ipRouteTable, .ipRouteEntry, .ipRouteDest, .ipRouteIfIndex, .ipRouteMetric1, .ipRouteMetric2, .ipRouteMetric3, .ipRouteMetric4, .ipRouteNextHop, .ipRouteName

| Name/OID | Value | Type |
|--|-----------------|-------------|
| .1.3.6.1.2.1.2.2.1.2.1
(iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr...) | Vlan1 | OctetString |
| .1.3.6.1.2.1.2.2.1.2.2
(iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr...) | FastEthernet0/0 | OctetString |
| .1.3.6.1.2.1.2.2.1.2.3
(iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr...) | FastEthernet0/1 | OctetString |
| .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 |
| .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 |

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

Informasi SNMP Router 3

MI B Browser

Address: 10.10.20.2 OID: .1.3.6.1.2.1.4.21.1.7

Advanced... Operations: Get GO

SNMP MIBs

- ifTable
 - ifEntry
 - ifIndex
 - ifDescr
 - ifType
 - ifMtu
 - ifSpeed
 - ifPhysAddress
 - ifAdminStatus
 - ifOperStatus
- ipRouteTable
 - ipRouteEntry
 - ipRouteDest
 - ipRouteIfIndex
 - ipRouteMetric1
 - ipRouteMetric2
 - ipRouteMetric3
 - ipRouteMetric4
 - ipRouteNextHop
 - ipRouteAge
 - ipRouteMask
 - ipRouteMetric5
- ospf
 - ospfGeneralGroup
 - ospfAreaTable
 - ospfSdbTable
 - ospfNbrTable
- ip2

Result Table

| Name/OID | Value | Type |
|---|------------|-----------|
| .1.3.6.1.2.1.4.21.1.7.10.10.10.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRoute...) | 10.10.20.1 | IpAddress |
| .1.3.6.1.2.1.4.21.1.7.10.10.20.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRoute...) | 0.0.0.0 | IpAddress |
| .1.3.6.1.2.1.4.21.1.7.192.168.1.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRoute...) | 10.10.20.1 | IpAddress |
| .1.3.6.1.2.1.4.21.1.7.192.168.2.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRoute...) | 10.10.20.1 | IpAddress |
| .1.3.6.1.2.1.4.21.1.7.192.168.3.0
(iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRoute...) | 0.0.0.0 | IpAddress |

Name : ipRouteNextHop

OID : .1.3.6.1.2.1.4.21.1.7

Syntax :

Access :

Description :

.iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable.ipRouteEntry.ipRouteNextHop

Informasi NextHop SNMP Router 3