

## T 2.3 Gestor SNMP

### Importante

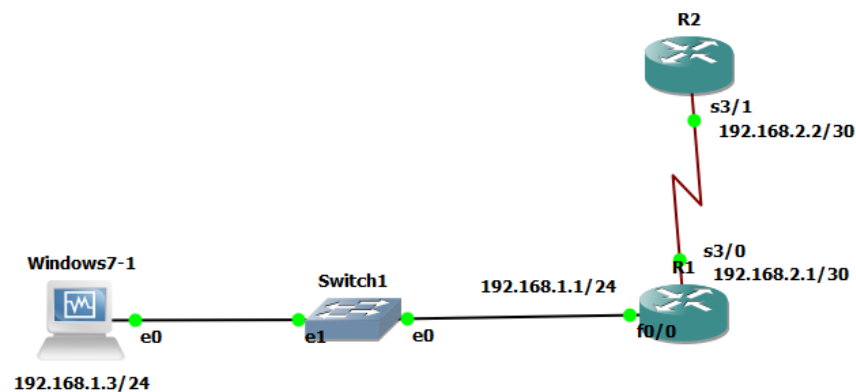
La versión de GNS3 en donde se realizó esta configuración es la 2.2.0

La de Oracle VirtualBox es la 6.0.14 r133895 (Qt5.6.2)

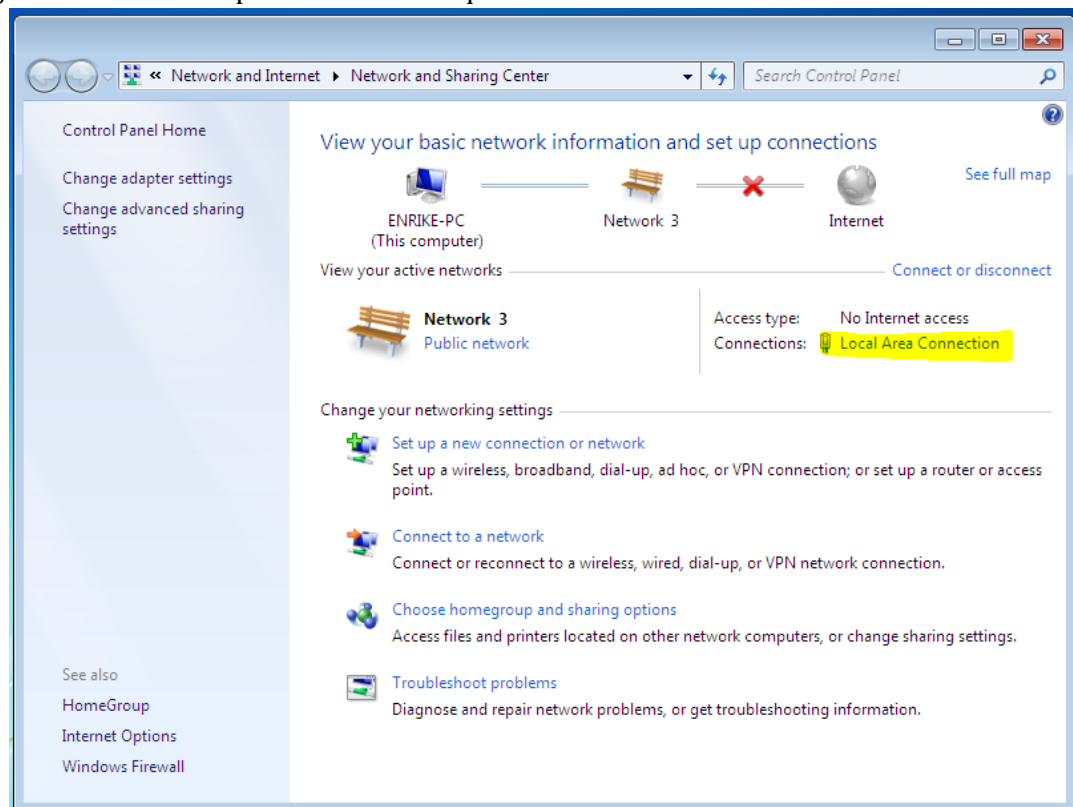
El gestor SNMP utilizado fue **MIB Browser**, y el sistema operativo de la máquina virtual fue Windows 7 de 32 bits

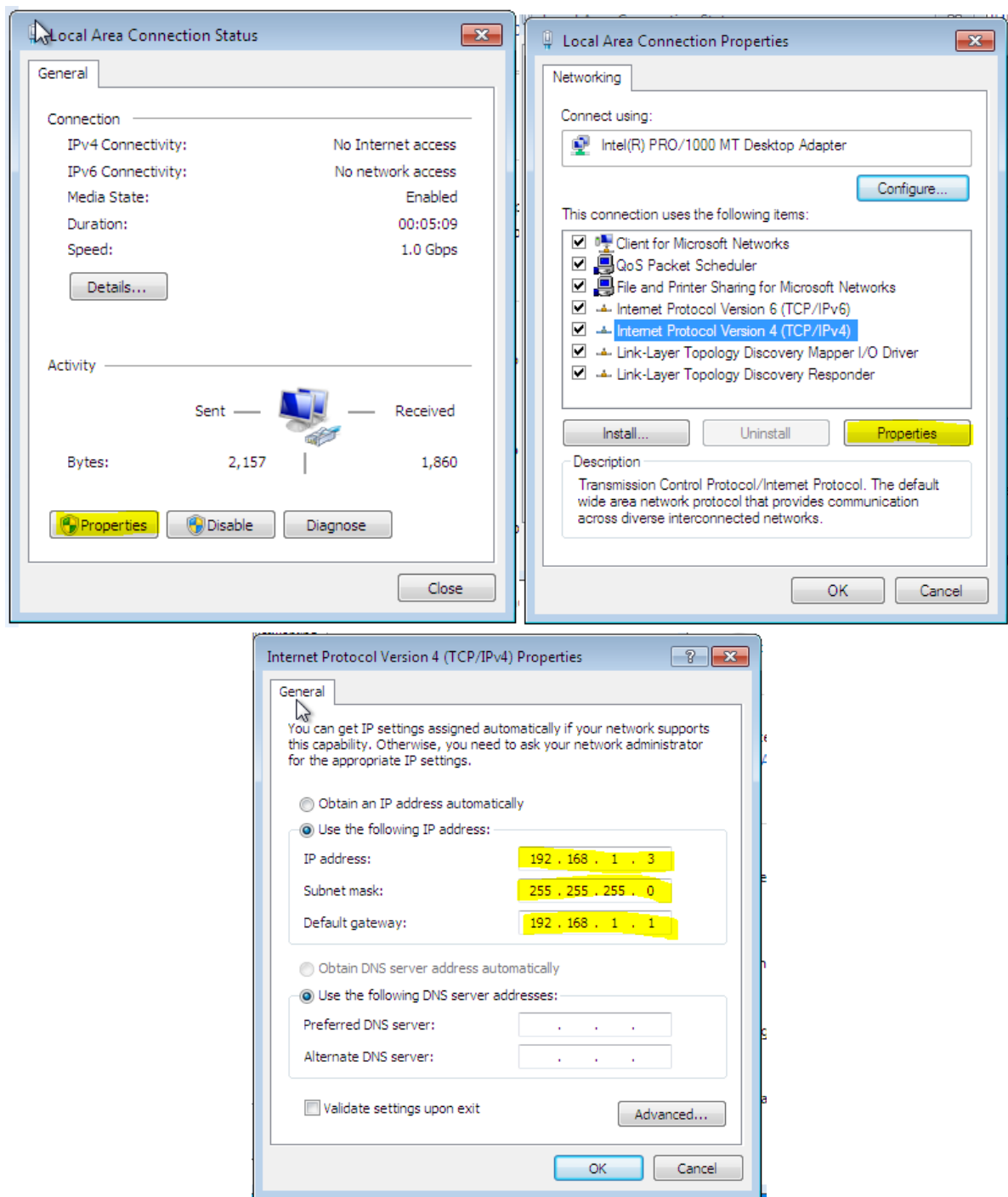
### Desarrollo

1. Construimos la siguiente topología. Asignamos las direcciones IP que se indican en cada interfaz. **NOTA IMPORTANTE: No configurar la interfaz serial3/0 del Router 1.**



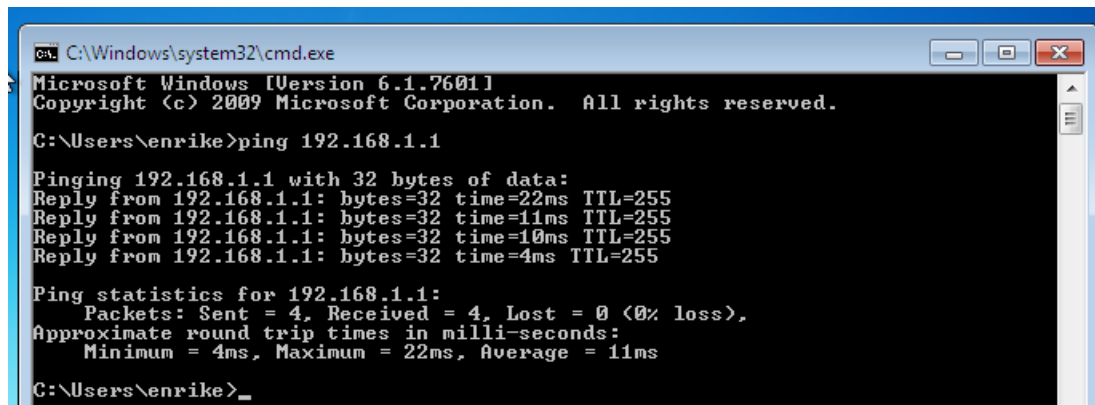
2. Asignamos la IP correspondiente a la máquina virtual de Windows 7





3. Verificamos que exista conexión entre la máquina virtual de Windows y el Router 1.

```
R1#  
R1#ping 192.168.1.3  
  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 192.168.1.3, timeout is 2 seconds:  
!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 52/72/124 ms  
R1#
```



```

C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\enrike>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time=22ms TTL=255
Reply from 192.168.1.1: bytes=32 time=11ms TTL=255
Reply from 192.168.1.1: bytes=32 time=10ms TTL=255
Reply from 192.168.1.1: bytes=32 time=4ms TTL=255

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 22ms, Average = 11ms

C:\Users\enrike>_

```

4. Configuramos el Router 1 como agente SNMP, utilizando la versión 2. Por el momento solamente definimos una comunidad de lectura ro\_4CM1, activamos el envío de trampas, definimos el host a donde se enviarán las trampas (siendo la dirección IP de la máquina virtual de Windows 7: 192.168.1.3/24), la versión de SNMP a usar:

```

R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#snmp-server community ro_4CM1 RO
R1(config)#snmp-server host 192.168.1.3 version 2c ro_4CM1
R1(config)#snmp-server enable traps
% Cannot enable both sham-link state-change interface traps.
% New sham link interface trap not enabled.
R1(config)#exit
R1#
R1#sh snmp
*Mar  1 01:10:17.299: %SYS-5-CONFIG_I: Configured from console by console
R1#sh snmp
Chassis: FTX0945W0MY
2 SNMP packets input
  0 Bad SNMP version errors
  0 Unknown community name
  0 Illegal operation for community name supplied
  0 Encoding errors
  2 Number of requested variables
  0 Number of altered variables
  2 Get-request PDUs
  0 Get-next PDUs
  0 Set-request PDUs
  0 Input queue packet drops (Maximum queue size 1000)
35 SNMP packets output
  0 Too big errors (Maximum packet size 1500)
  0 No such name errors
  0 Bad values errors
  0 General errors
  2 Response PDUs
  33 Trap PDUs

SNMP logging: enabled
Logging to 192.168.1.3.162, 0/10, 21 sent, 12 dropped.
R1#

```

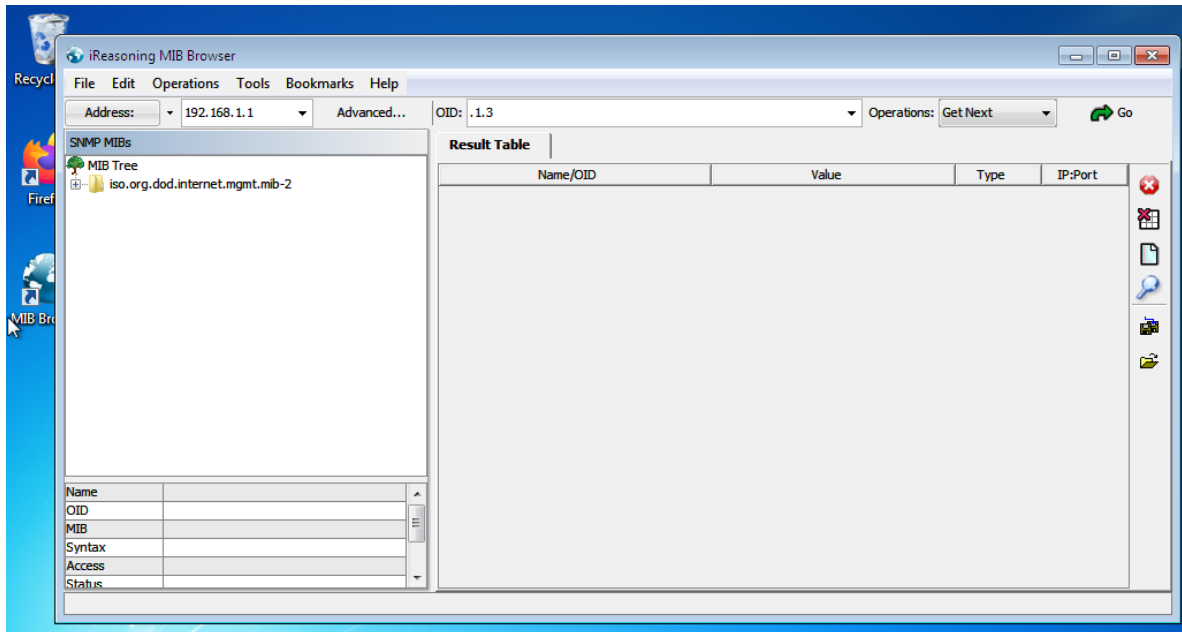
Podemos habilitar de mostrar la información de paquetes SNMP en la consola del router con el siguiente comando:

```

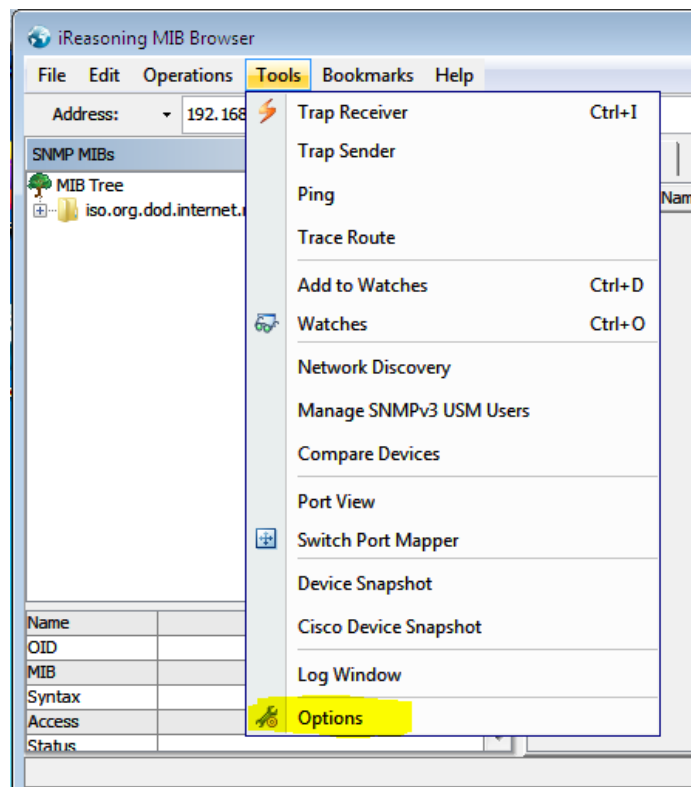
R1#debug snmp packets
SNMP packet debugging is on
R1#

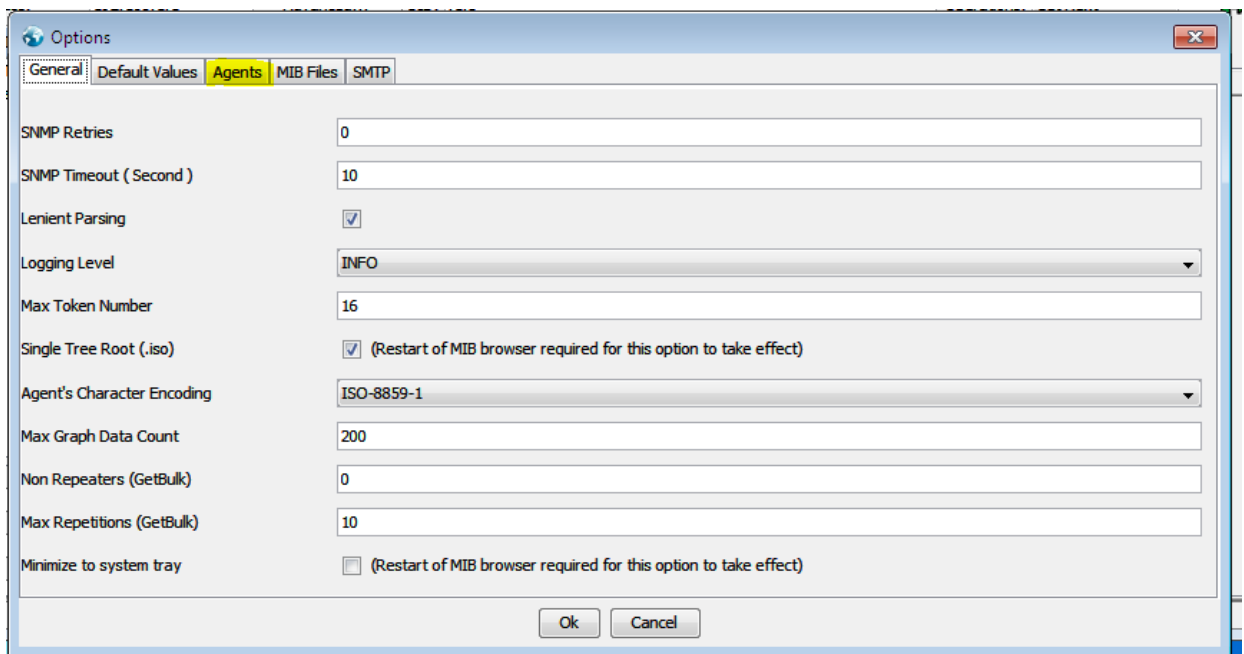
```

5. En la máquina virtual de Windows 7, descargamos e instalamos MIB Browser, que será nuestro gestor SNMP. Al abrirlo, aparecerá la siguiente pantalla.



6. Agregamos un agente SNMP versión 2. Aquí pondremos la dirección IP del agente SNMP en el Router 1, es decir, el default gateway. Adicionalmente, indicamos la comunidad de lectura y la versión SNMP.

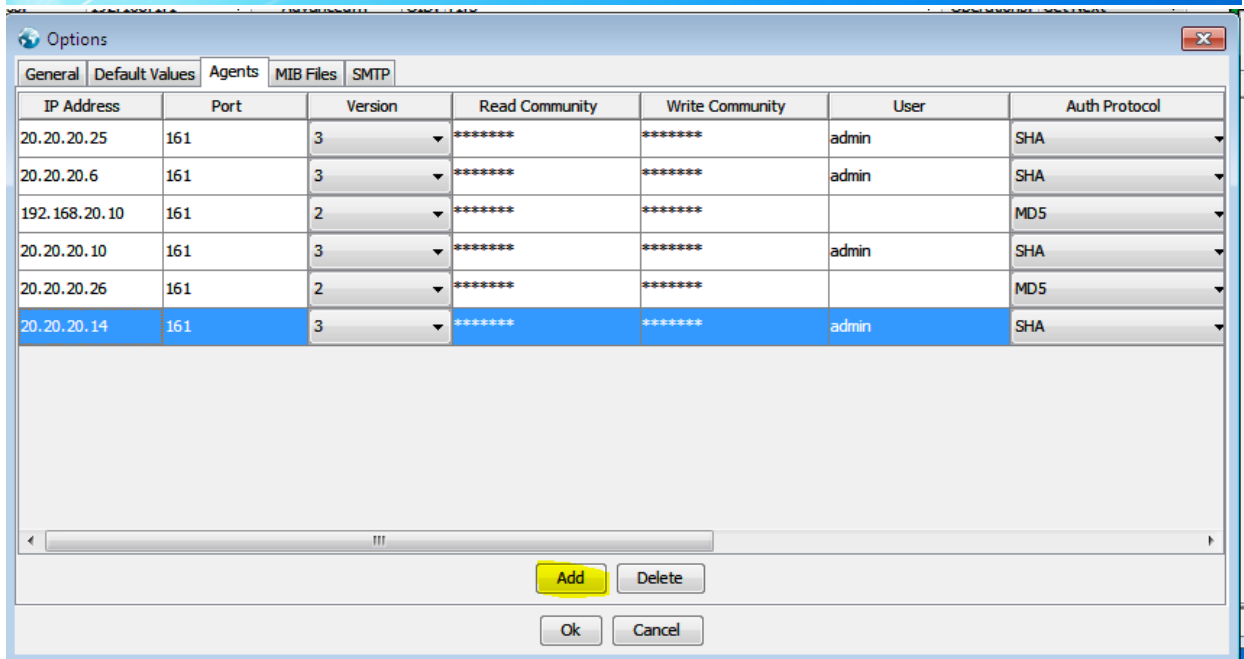




Options dialog box, Agents tab. The dialog has tabs for General, Default Values, Agents, MIB Files, and SMTP. The Agents tab is active, showing various configuration options for SNMP agents.

SNMP Retries	0
SNMP Timeout ( Second )	10
Lenient Parsing	<input checked="" type="checkbox"/>
Logging Level	INFO
Max Token Number	16
Single Tree Root (.iso)	<input checked="" type="checkbox"/> (Restart of MIB browser required for this option to take effect)
Agent's Character Encoding	ISO-8859-1
Max Graph Data Count	200
Non Repeaters (GetBulk)	0
Max Repetitions (GetBulk)	10
Minimize to system tray	<input type="checkbox"/> (Restart of MIB browser required for this option to take effect)

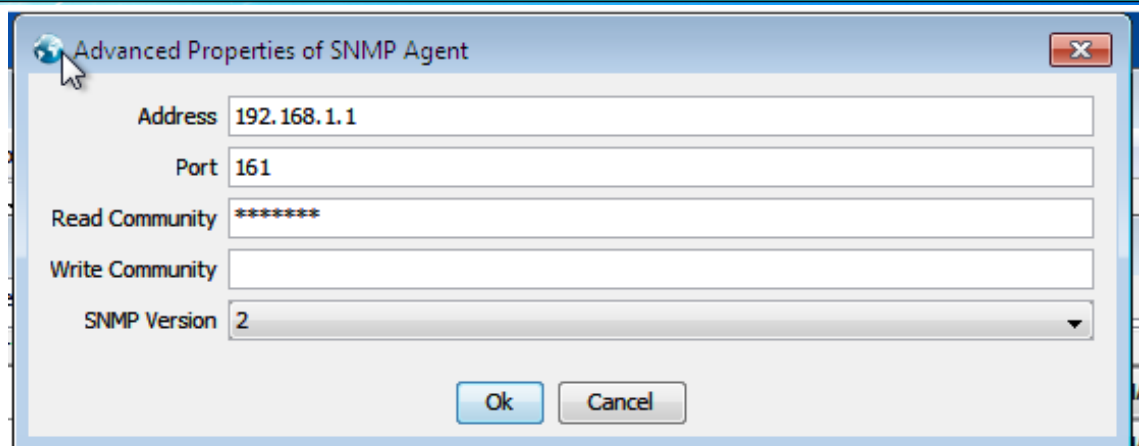
Buttons: Ok, Cancel



Options dialog box, Agents tab, Agent list. The dialog shows a table of configured agents with columns for IP Address, Port, Version, Read Community, Write Community, User, and Auth Protocol.

IP Address	Port	Version	Read Community	Write Community	User	Auth Protocol
20.20.20.25	161	3	*****	*****	admin	SHA
20.20.20.6	161	3	*****	*****	admin	SHA
192.168.20.10	161	2	*****	*****		MD5
20.20.20.10	161	3	*****	*****	admin	SHA
20.20.20.26	161	2	*****	*****		MD5
20.20.20.14	161	3	*****	*****	admin	SHA

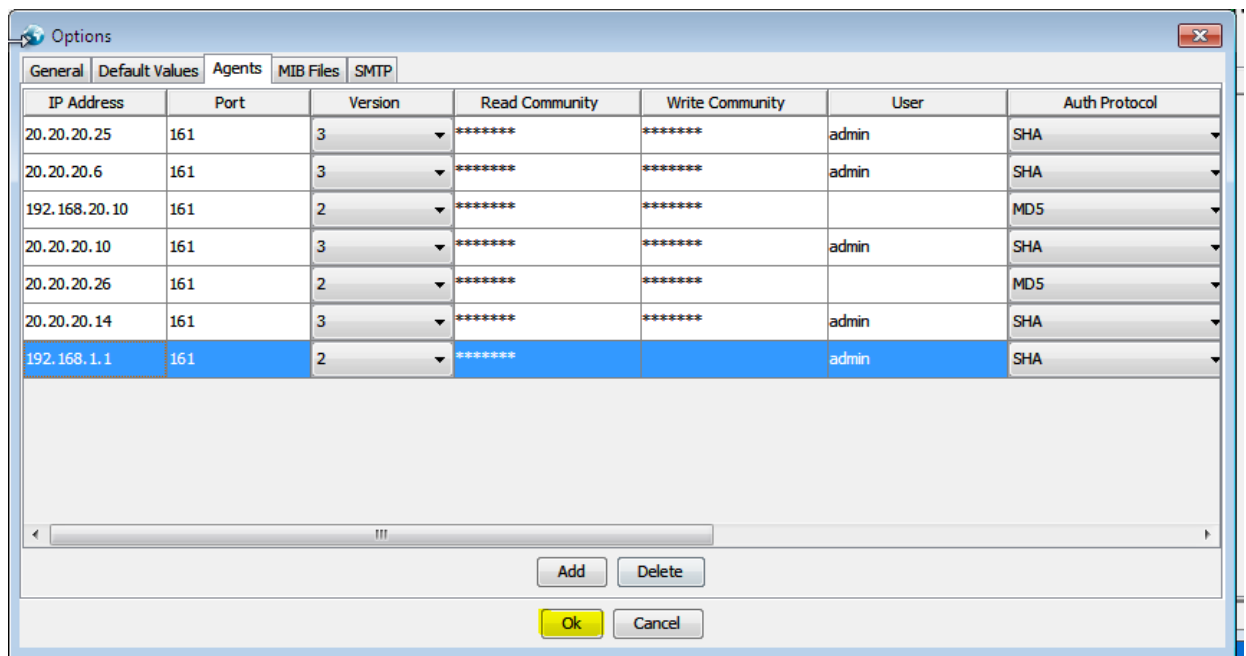
Buttons: Add, Delete, Ok, Cancel



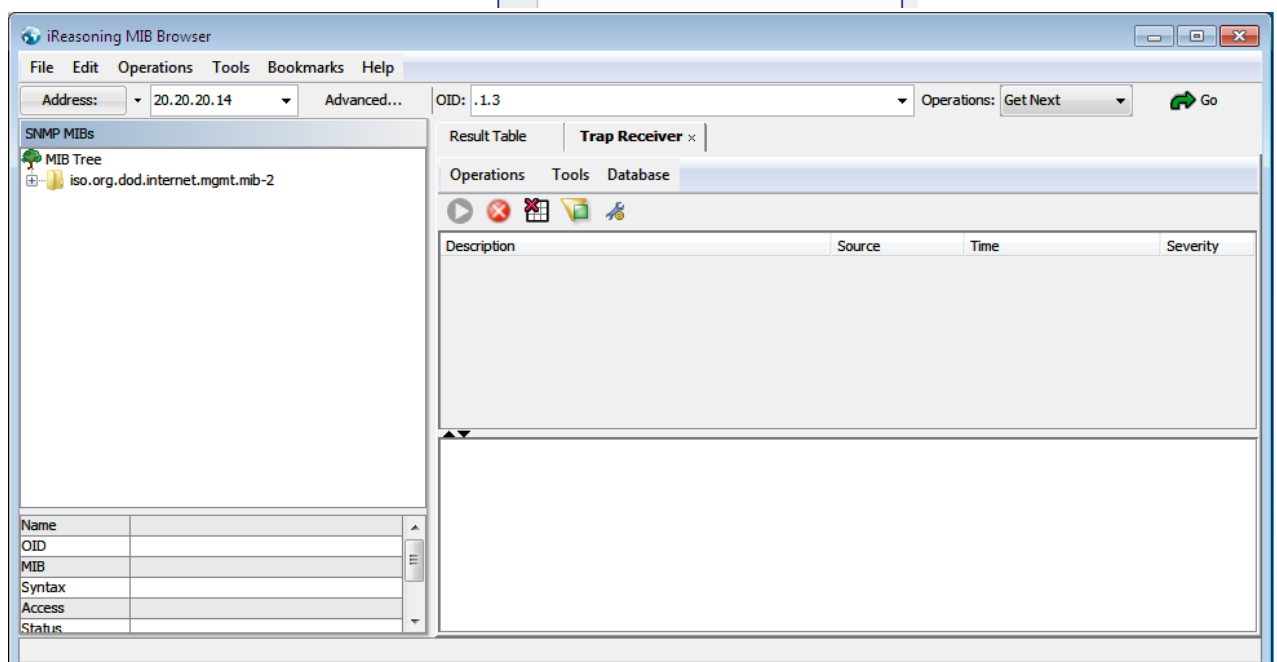
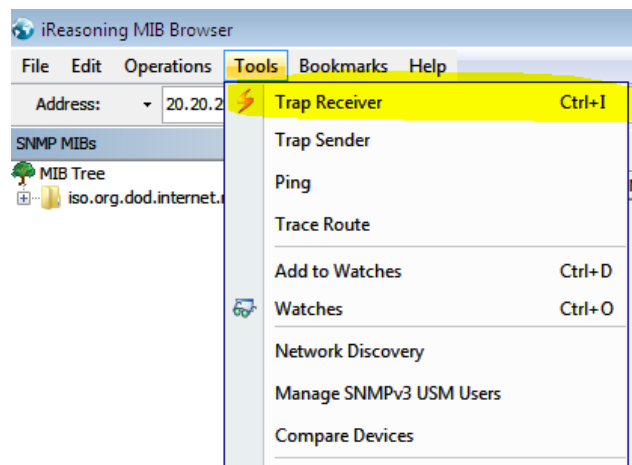
Advanced Properties of SNMP Agent dialog box. The dialog shows fields for Address, Port, Read Community, Write Community, and SNMP Version.

Address	192.168.1.1
Port	161
Read Community	*****
Write Community	
SNMP Version	2

Buttons: Ok, Cancel



7. Lo siguiente es activar el receptor de trampas. En este paso no hay nada por configurar tratándose de SNMP versión 2.



8. De regreso en el router, configuramos la interfaz serial3/0 que habíamos dejado pendiente. Al hacer esto, se estarán enviando trampas SNMPv2 en segundo plano hacia el gestor; podemos comprobar esto por el tipo de mensajes que aparecen en consola:

```
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#i
*Mar 1 01:22:23.059: SNMP: Queuing packet to 192.168.1.3
*Mar 1 01:22:23.063: SNMP: V2 Trap, reqid 34, errstat 0, erridx 0
sysUpTime.0 = 494306
snmpTrapOID.0 = ciscoConfigManMIB.2.0.1
ccmHistoryEventEntry.3.12 = 1
ccmHistoryEventEntry.4.12 = 2
ccmHistoryEventEntry.5.12 = 3
*Mar 1 01:22:23.311: SNMP: Packet sent via UDP to 192.168.1.3
R1(config)#int serial 3/0
R1(config-if)#ip add 192.168.2.1 255.255.255.252
R1(config-if)#no sh
R1(config-if)#
*Mar 1 01:22:46.963: %LINK-3-UPDOWN: Interface Serial3/0, changed state to up
R1(config-if)#
*Mar 1 01:22:46.991: SNMP: Queuing packet to 192.168.1.3
*Mar 1 01:22:46.991: SNMP: V2 Trap, reqid 35, errstat 0, erridx 0
sysUpTime.0 = 496698
snmpTrapOID.0 = ciscoSyslogMIB.2.0.1
clogHistoryEntry.2.3 = LINK
clogHistoryEntry.3.3 = 4
clogHistoryEntry.4.3 = UPDOWN
clogHistoryEntry.5.3 = Interface Serial3/0, changed state to up
clogHistoryEntry.6.3 = 496696
*Mar 1 01:22:47.255: SNMP: Packet sent via UDP to 192.168.1.3
*Mar 1 01:22:47.971: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0,
changed state to up
R1(config-if)#
*Mar 1 01:22:47.975: SNMP: Queuing packet to 192.168.1.3
*Mar 1 01:22:47.979: SNMP: V2 Trap, reqid 36, errstat 0, erridx 0
sysUpTime.0 = 496797
snmpTrapOID.0 = snmpTraps.4
ifIndex.8 = 8
ifDescr.8 = Serial3/0
ifType.8 = 22
lifEntry.20.8 = up
*Mar 1 01:22:48.231: SNMP: Packet sent via UDP to 192.168.1.3
R1(config-if)#
```

9. En MIB Browser veremos las trampas recibidas del Router 1, así como información relacionada a la configuración de la interfaz serial3/0.

The first screenshot shows the iReasoning MIB Browser interface. The left pane displays the MIB Tree with 'iso.org.dod.internet.mgmt.mib-2' selected. The right pane shows the 'Trap Receiver' tab with a table of received traps. The table has columns: Description, Source, Time, and Severity. The selected row is .1.3.6.1.4.1.9.9.41.2.0.1, which corresponds to the 'Trap OID' field in the details pane. The details pane shows the following information:

- Source:** 192.168.1.1
- Timestamp:** 1 hour 22 minutes 46 seconds
- SNMP Version:** 2
- Trap OID:** .1.3.6.1.4.1.9.9.41.2.0.1
- Community:** ro\_4CM1
- Variable Bindings:**
  - Name:** .iso.org.dod.internet.mgmt.mib-2.system.sysUpTime.0
  - Value:** [TimeTicks] 1 hour 22 minutes 46 seconds (496698)

The second screenshot shows the same iReasoning MIB Browser interface, but the 'Trap Receiver' tab is now showing the 'Result Table' with the following data:

Description	Source	Time	Severity
.1.3.6.1.6.3.1.1.5.4	192.168.1.1	2019-11-08 19:43:19	
.1.3.6.1.4.1.9.9.41.2.0.1	192.168.1.1	2019-11-08 19:43:18	
.1.3.6.1.4.1.9.9.43.2.0.1	192.168.1.1	2019-11-08 19:42:56	

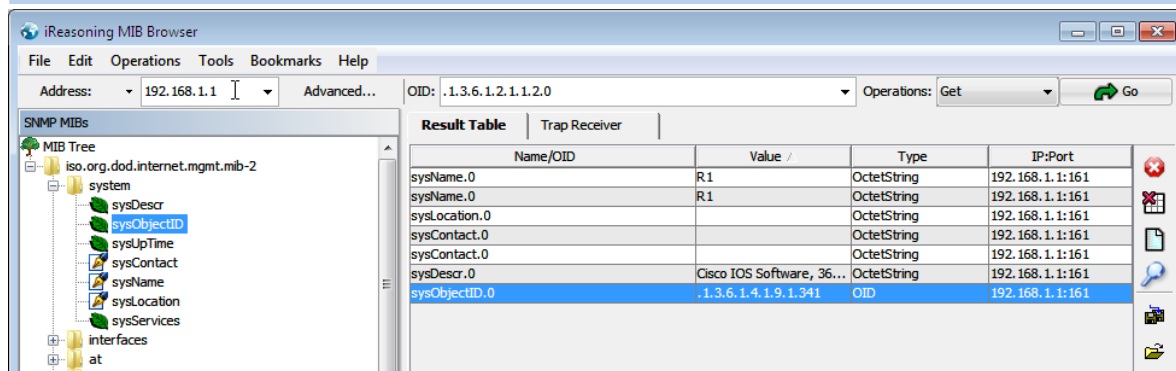
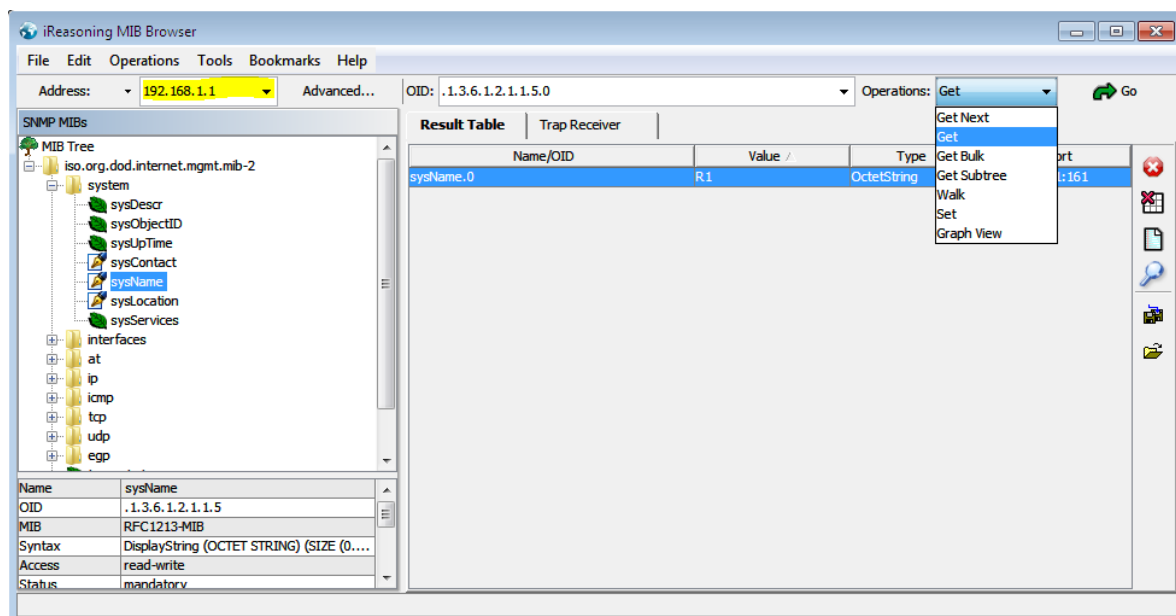
The details pane now shows the following information:

- Name:** .1.3.6.1.4.1.9.9.41.1.2.3.1.4.3
- Value:** [OctetString] UPDOWN
- Name:** .1.3.6.1.4.1.9.9.41.1.2.3.1.5.3
- Value:** [OctetString] Interface Serial3/0, changed state to up
- Name:** .1.3.6.1.4.1.9.9.41.1.2.3.1.6.3

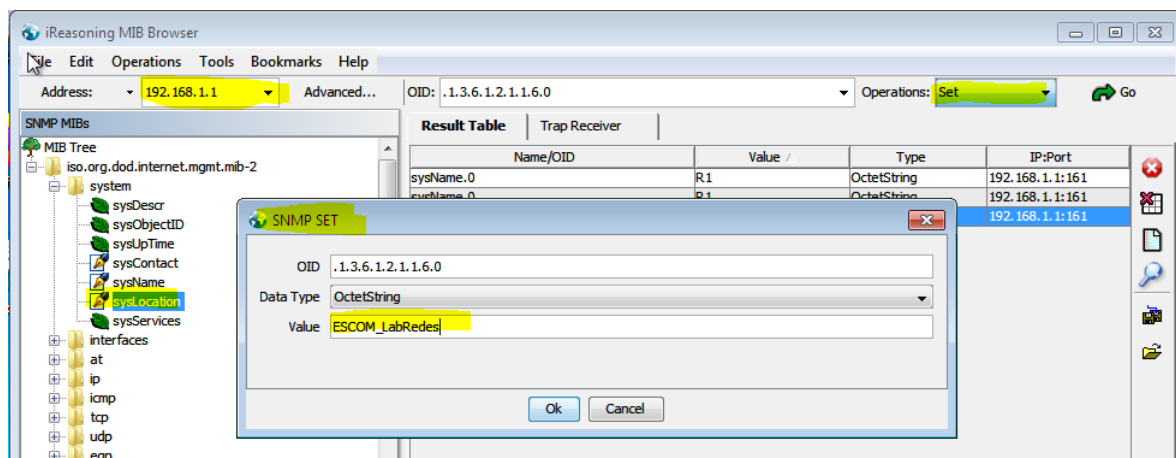


10. Se pueden realizar comandos de consulta en la MIB del agente SNMP (Router 1) de la siguiente forma:

### SNMPGET:



### SNMPSET:



De momento esta opción provocará un fallo, ya que no se configuro ninguna comunidad de escritura, pero nos servirá para futuras prácticas.