Sri Lanka Institute of Information Technology

Network Design & Management

IT3060

Lab Report 05

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Introduction

Simple Network Management Protocol (SNMP) serves as the backbone of modern network monitoring systems, enabling administrators to efficiently manage routers, switches, and servers across complex infrastructures. This laboratory exercise, conducted as part of SLIIT's Network Design and Management (IT3060) curriculum, provides hands-on experience in implementing SNMP services on CentOS platforms. The experiment focuses on three critical aspects: configuration of SNMP agents, navigation of Management Information Base (MIB) hierarchies, and practical application of SNMP commands for network device monitoring.

Building upon theoretical concepts covered in NDM lectures, this practical session emphasizes the protocol's operational framework, including community-based authentication and Object Identifier (OID) structures. Through systematic implementation, students gain proficiency in service installation, access control configuration using snmpd.conf, and verification techniques using essential SNMP utilities. The lab particularly highlights the relationship between MIB trees and their practical implementation in enterprise network monitoring solutions, aligning with SLIIT's competency-based learning objectives for network administration professionals.

Lab 05 Methodology

Step 01:Stopping service and Network configuration

(Before SNMP setup, existing services were stopped to prevent conflicts)

```
service dhcpd stop

service named stop
```

(Root privileged need for the terminal)

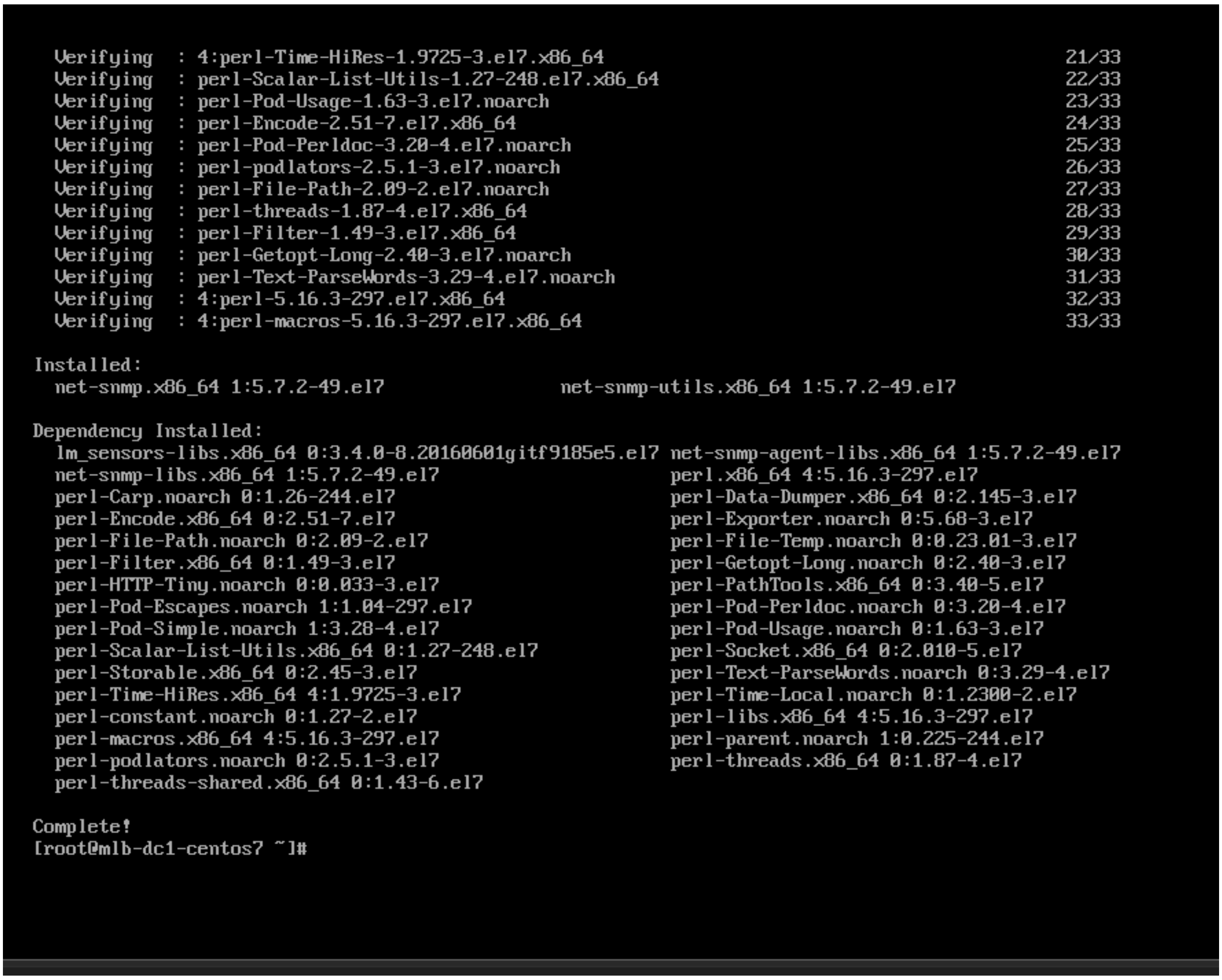
Step 02:After turning of the VMnet2(local network) and turn on the internet adapter

Or you can restart network (Network was configured for automatic IP assignment)

```
Service network restart
```

Step02: After that install the SNMP packages by the command

yum install -y net-snmp net-snmp-utils



```
  Verifying  : 4:perl-Time-HiRes-1.9725-3.el7.x86_64                                    21/33
  Verifying  : perl-Scalar-List-Utils-1.27-248.el7.x86_64                               22/33
  Verifying  : perl-Pod-Usage-1.63-3.el7.noarch                                         23/33
  Verifying  : perl-Encode-2.51-7.el7.x86_64                                            24/33
  Verifying  : perl-Pod-Perldoc-3.20-4.el7.noarch                                       25/33
  Verifying  : perl-podlators-2.5.1-3.el7.noarch                                        26/33
  Verifying  : perl-File-Path-2.09-2.el7.noarch                                         27/33
  Verifying  : perl-threads-1.87-4.el7.x86_64                                           28/33
  Verifying  : perl-Filter-1.49-3.el7.x86_64                                            29/33
  Verifying  : perl-Getopt-Long-2.40-3.el7.noarch                                       30/33
  Verifying  : perl-Text-ParseWords-3.29-4.el7.noarch                                   31/33
  Verifying  : 4:perl-5.16.3-297.el7.x86_64                                             32/33
  Verifying  : 4:perl-macros-5.16.3-297.el7.x86_64                                      33/33

Installed:
  net-snmp.x86_64 1:5.7.2-49.el7                net-snmp-utils.x86_64 1:5.7.2-49.el7

Dependency Installed:
  lm_sensors-libs.x86_64 0:3.4.0-8.20160601gitf9185e5.el7 net-snmp-agent-libs.x86_64 1:5.7.2-49.el7
  net-snmp-libs.x86_64 1:5.7.2-49.el7                     perl.x86_64 4:5.16.3-297.el7
  perl-Carp.noarch 0:1.26-244.el7                         perl-Data-Dumper.x86_64 0:2.145-3.el7
  perl-Encode.x86_64 0:2.51-7.el7                         perl-Exporter.noarch 0:5.68-3.el7
  perl-File-Path.noarch 0:2.09-2.el7                      perl-File-Temp.noarch 0:0.23.01-3.el7
  perl-Filter.x86_64 0:1.49-3.el7                         perl-Getopt-Long.noarch 0:2.40-3.el7
  perl-HTTP-Tiny.noarch 0:0.033-3.el7                     perl-PathTools.x86_64 0:3.40-5.el7
  perl-Pod-Escapes.noarch 1:1.04-297.el7                  perl-Pod-Perldoc.noarch 0:3.20-4.el7
  perl-Pod-Simple.noarch 1:3.28-4.el7                     perl-Pod-Usage.noarch 0:1.63-3.el7
  perl-Scalar-List-Utils.x86_64 0:1.27-248.el7            perl-Socket.x86_64 0:2.010-5.el7
  perl-Storable.x86_64 0:2.45-3.el7                       perl-Text-ParseWords.noarch 0:3.29-4.el7
  perl-Time-HiRes.x86_64 4:1.9725-3.el7                   perl-Time-Local.noarch 0:1.2300-2.el7
  perl-constant.noarch 0:1.27-2.el7                       perl-libs.x86_64 4:5.16.3-297.el7
  perl-macros.x86_64 4:5.16.3-297.el7                     perl-parent.noarch 1:0.225-244.el7
  perl-podlators.noarch 0:2.5.1-3.el7                     perl-threads.x86_64 0:1.87-4.el7
  perl-threads-shared.x86_64 0:1.43-6.el7

Complete!
[root@mlb-dc1-centos7 ~]#
```

- **net-snmp:** SNMP daemon
- **net-snmp-utils:** SNMP management tools

Step 03: Manual IP Configuration

The network was switched to **vmnet2 (Host-Only)** with manual IP settings:
Network Settings:

- **IP Address:** 10.0.1.2
- **Netmask:** 255.255.255.0
- **Gateway:** 10.0.1.1

Step 04:SNMP configuration

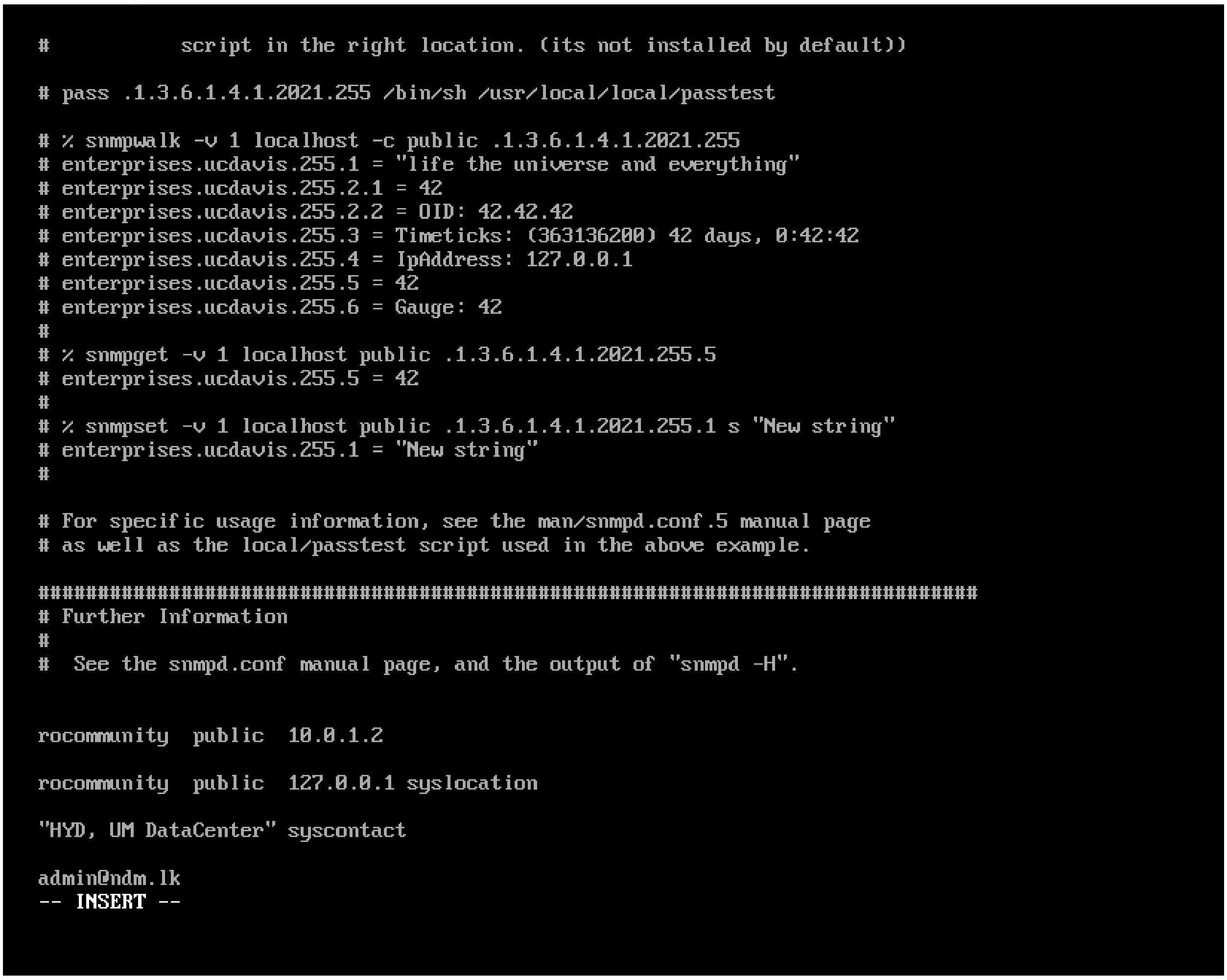
The SNMP configuration file was edited to define access permissions.

Add configuration to /etc/snmp/snmpd.conf as below

```
rocommunity public xxx.xxx.xxx.xxx
rocommunity public 127.0.0.1
syslocation "HYD, UM DataCenter"
syscontact admin@ndm.lk
```

Replace xxx.xxx.xxx.xxx with the IP address of the server that you want to allow SNMP lookups from

(in here my case 10.0.1.2)



```
#           script in the right location. (its not installed by default))

# pass .1.3.6.1.4.1.2021.255 /bin/sh /usr/local/local/passtest

# % snmpwalk -v 1 localhost -c public .1.3.6.1.4.1.2021.255
# enterprises.ucdavis.255.1 = "life the universe and everything"
# enterprises.ucdavis.255.2.1 = 42
# enterprises.ucdavis.255.2.2 = OID: 42.42.42
# enterprises.ucdavis.255.3 = Timeticks: (363136200) 42 days, 0:42:42
# enterprises.ucdavis.255.4 = IpAddress: 127.0.0.1
# enterprises.ucdavis.255.5 = 42
# enterprises.ucdavis.255.6 = Gauge: 42
#
# % snmpget -v 1 localhost public .1.3.6.1.4.1.2021.255.5
# enterprises.ucdavis.255.5 = 42
#
# % snmpset -v 1 localhost public .1.3.6.1.4.1.2021.255.1 s "New string"
# enterprises.ucdavis.255.1 = "New string"
#

# For specific usage information, see the man/snmpd.conf.5 manual page
# as well as the local/passtest script used in the above example.

###############################################################################
# Further Information
#
#  See the snmpd.conf manual page, and the output of "snmpd -H".


rocommunity  public  10.0.1.2

rocommunity  public  127.0.0.1 syslocation

"HYD, UM DataCenter" syscontact

admin@ndm.lk
-- INSERT --
```

Then start the SNMP service

service snmpd start

Step 05:

snmptranslate – MIB Tree Navigation
Translates OID names between numeric and textual forms.

(The snmptranslate tool is a very powerful tool that allows you to browse the MIB tree in various ways from the command line)

In its simplest form, it merely looks up an OID and spits it back out in textual form:
"snmptranslate .1.3.6.1.2.1.1.3.0" output: SNMPv2-MIB::sysUpTime.0

It can also translate into numerical results as well, by adding the -On flag to its options

snmptranslate -On SNMPv2-MIB::system.sysUpTime.0 output: .1.3.6.1.2.1.1.3.0

Note that the argument passed can describe a OID in any fashion, and the -On flag merely toggles which type of output is displayed:

"snmptranslate .iso.3.6.1.private.enterprises.2021.2.1.prNames.0" output: NET-SNMP-MIB::prNames.0
snmptranslate -On .iso.3.6.1.private.enterprises.2021.2.1.prNames.0 .1.3.6.1.4.1.2021.2.1.2.0 2

Note how the oid was abbreviated for you? You can change this behaviour as well with -Of:

"snmptranslate .iso.3.6.1.private.enterprises.2021.2.1.prNames.0" NET-SNMP-MIB::prNames.0

"snmptranslate -On .iso.3.6.1.private.enterprises.2021.2.1.prNames.0" .1.3.6.1.4.1.2021.2.1.2.0

"snmptranslate -Of .iso.3.6.1.private.enterprises.2021.2.1.prNames.0"
output:.iso.org.dod.internet.private. enterprises.ucdavis.procTable.prEntry.p rNames.0

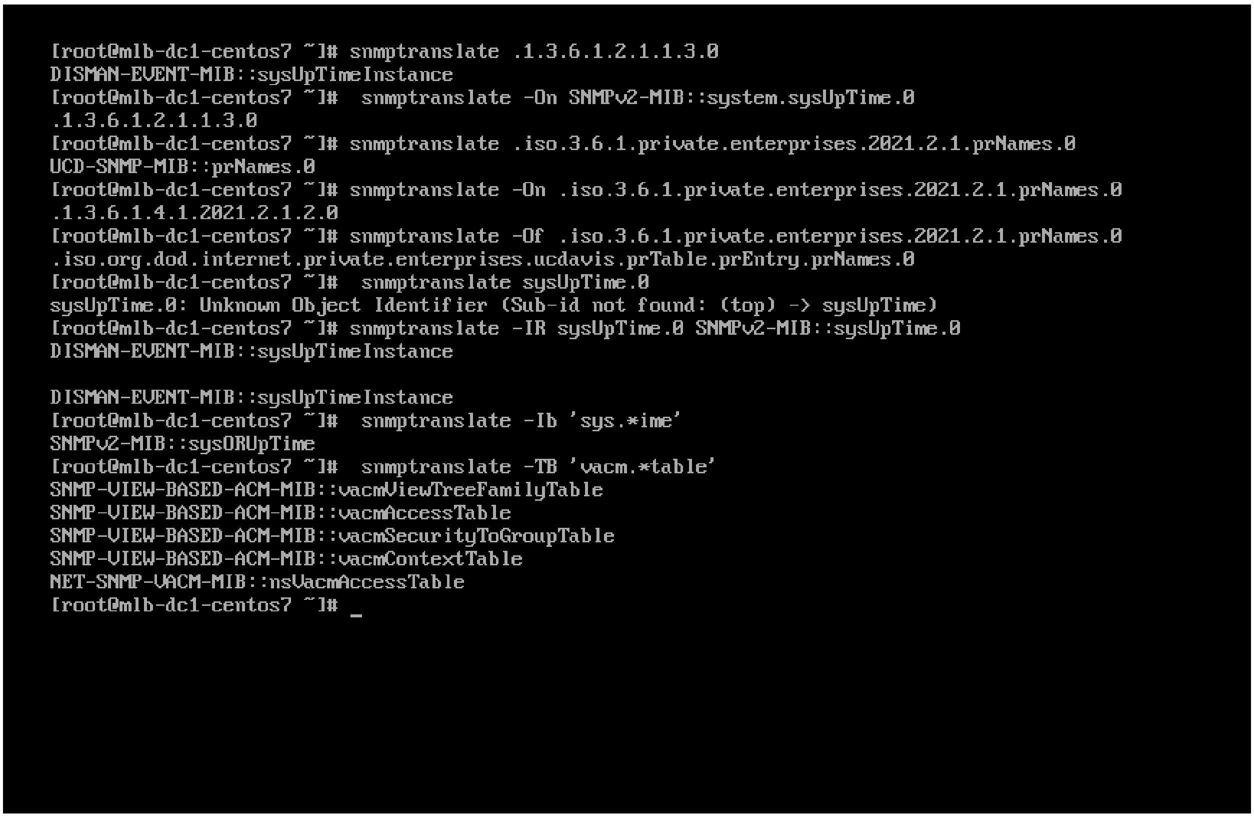
"snmptranslate sysUpTime.0"
Output: Invalid object identifier: sysUpTime.0
snmptranslate -IR sysUpTime.0
output: SNMPv2-MIB::sysUpTime.0

snmptranslate -Ib 'sys.*ime' system.sysUpTime

snmptranslate -TB 'vacm.*table'

SNMP-VIEW-BASED-ACM-MIB::vacmViewTreeFamilyTable
SNMP-VIEW-BASED-ACM-MIB::vacmAccessTable
SNMP-VIEW-BASED-ACM- MIB::vacmSecurityToGroupTable SNMP-VIEW-BASED ACM-MIB::vacmContextTable

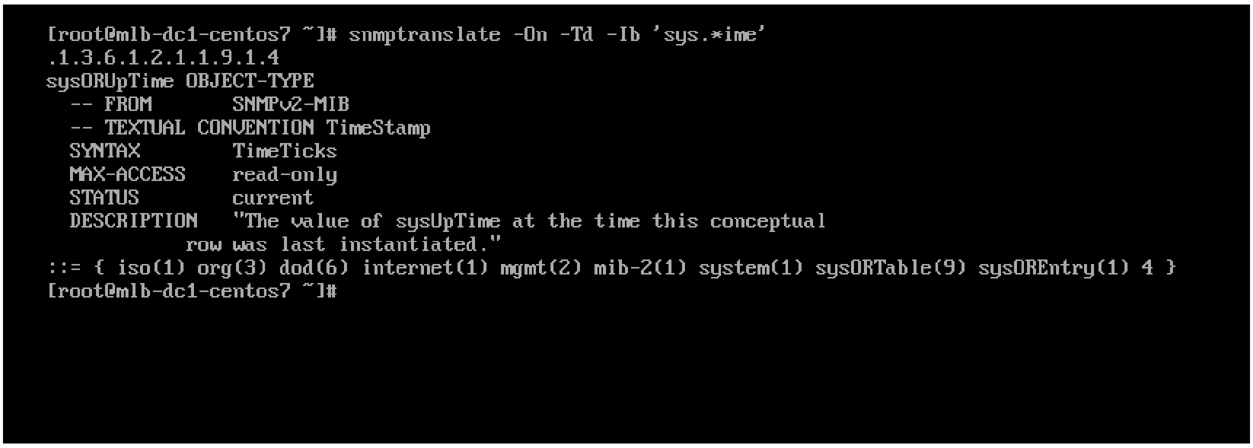
All above commands are in this picture



```
[root@mlb-dc1-centos7 ~]# snmptranslate .1.3.6.1.2.1.1.3.0
DISMAN-EVENT-MIB::sysUpTimeInstance
[root@mlb-dc1-centos7 ~]#  snmptranslate -On SNMPv2-MIB::system.sysUpTime.0
.1.3.6.1.2.1.1.3.0
[root@mlb-dc1-centos7 ~]# snmptranslate .iso.3.6.1.private.enterprises.2021.2.1.prNames.0
UCD-SNMP-MIB::prNames.0
[root@mlb-dc1-centos7 ~]# snmptranslate -On .iso.3.6.1.private.enterprises.2021.2.1.prNames.0
.1.3.6.1.4.1.2021.2.1.2.0
[root@mlb-dc1-centos7 ~]# snmptranslate -Of .iso.3.6.1.private.enterprises.2021.2.1.prNames.0
.iso.org.dod.internet.private.enterprises.ucdavis.prTable.prEntry.prNames.0
[root@mlb-dc1-centos7 ~]#  snmptranslate sysUpTime.0
sysUpTime.0: Unknown Object Identifier (Sub-id not found: (top) -> sysUpTime)
[root@mlb-dc1-centos7 ~]# snmptranslate -IR sysUpTime.0 SNMPv2-MIB::sysUpTime.0
DISMAN-EVENT-MIB::sysUpTimeInstance

DISMAN-EVENT-MIB::sysUpTimeInstance
[root@mlb-dc1-centos7 ~]#  snmptranslate -Ib 'sys.*ime'
SNMPv2-MIB::sysORUpTime
[root@mlb-dc1-centos7 ~]#  snmptranslate -TB 'vacm.*table'
SNMP-VIEW-BASED-ACM-MIB::vacmViewTreeFamilyTable
SNMP-VIEW-BASED-ACM-MIB::vacmAccessTable
SNMP-VIEW-BASED-ACM-MIB::vacmSecurityToGroupTable
SNMP-VIEW-BASED-ACM-MIB::vacmContextTable
NET-SNMP-VACM-MIB::nsVacmAccessTable
[root@mlb-dc1-centos7 ~]# _
```

To get extended information about a mib node, use the -Td (description) flag

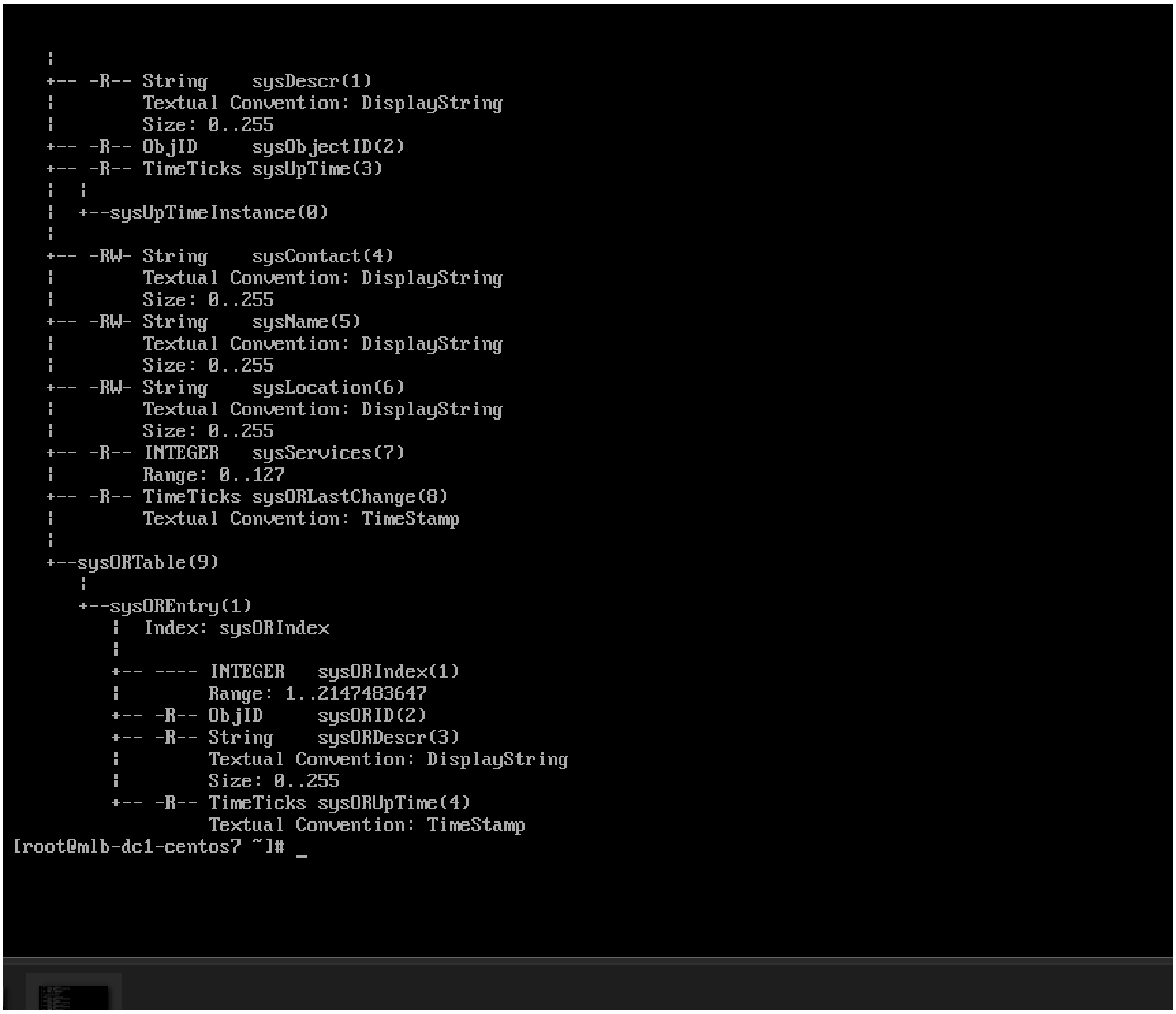
“snmptranslate -On -Td -Ib 'sys.*ime' ”



```
[root@mlb-dc1-centos7 ~]# snmptranslate -On -Td -Ib 'sys.*ime'
.1.3.6.1.2.1.1.9.1.4
sysORUpTime OBJECT-TYPE
  -- FROM       SNMPv2-MIB
  -- TEXTUAL CONVENTION TimeStamp
  SYNTAX        TimeTicks
  MAX-ACCESS    read-only
  STATUS        current
  DESCRIPTION   "The value of sysUpTime at the time this conceptual
            row was last instantiated."
::= { iso(1) org(3) dod(6) internet(1) mgmt(2) mib-2(1) system(1) sysORTable(9) sysOREntry(1) 4 }
[root@mlb-dc1-centos7 ~]#
```

Finally, last but certainly not least, if you want a pretty diagram of a section of the mib tree, check out the -Tp flag:

snmptranslate -Tp -IR system



```
   |
   +-- -R-- String    sysDescr(1)
   |        Textual Convention: DisplayString
   |        Size: 0..255
   +-- -R-- ObjID     sysObjectID(2)
   +-- -R-- TimeTicks sysUpTime(3)
   |  |
   |  +--sysUpTimeInstance(0)
   |
   +-- -RW- String    sysContact(4)
   |        Textual Convention: DisplayString
   |        Size: 0..255
   +-- -RW- String    sysName(5)
   |        Textual Convention: DisplayString
   |        Size: 0..255
   +-- -RW- String    sysLocation(6)
   |        Textual Convention: DisplayString
   |        Size: 0..255
   +-- -R-- INTEGER   sysServices(7)
   |        Range: 0..127
   +-- -R-- TimeTicks sysORLastChange(8)
   |        Textual Convention: TimeStamp
   |
   +--sysORTable(9)
      |
      +--sysOREntry(1)
         |  Index: sysORIndex
         |
         +-- ---- INTEGER   sysORIndex(1)
         |        Range: 1..2147483647
         +-- -R-- ObjID     sysORID(2)
         +-- -R-- String    sysORDescr(3)
         |        Textual Convention: DisplayString
         |        Size: 0..255
         +-- -R-- TimeTicks sysORUpTime(4)
                  Textual Convention: TimeStamp
[root@mlb-dc1-centos7 ~]# _
```

snmpget : retrieving data from a host.

Key Features:

- Requires:
  - Hostname/IP
  - Authentication (community string)
  - Object Identifier (OID)
- Supports SNMPv1, v2c, and v3.

The snmpget command can be used to retrieve data from a remote host given its host name, authentication information and an OID. As a simple example:
In the above example, test.net-snmp.org is the host name we wanted to talk to, using the SNMP community string demopublic and we requested the value of the OID system.sysUpTime.0.

```
snmpget -v 1 -c public 10.0.1.2 system.sysUpTime.0
```

The result from a command using the SNMPv2c version would have been the same:

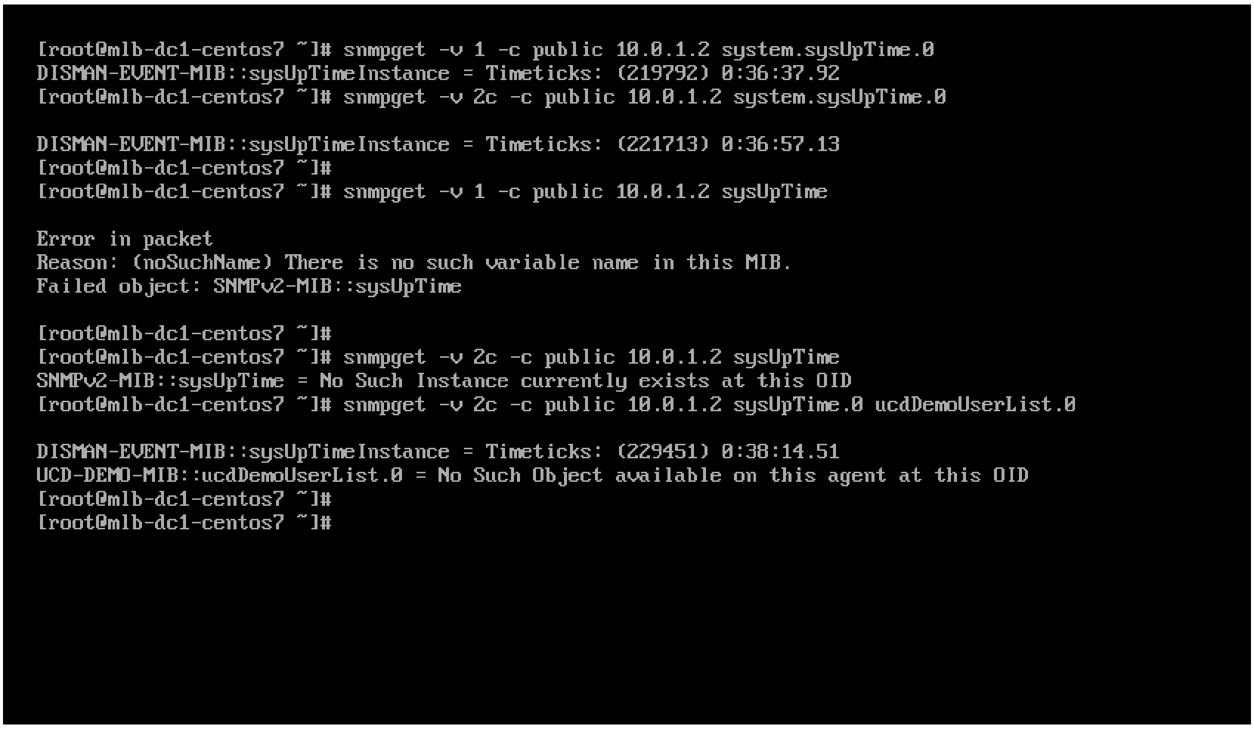
```
snmpget -v 2c -c public 10.0.1.2 system.sysUpTime.0
```

All of the utilities allow abbreviation of the OIDs and do random searches by default, and hence you can only specify a small portion of the oid if you would prefer:

A common mistake when using the snmpget command is to leave off the index into the data you're looking for. In the above commands, the variable requested by the OID is a scalar and the index to scalars is always a simple '0' (zero), hence the trailing '.0' in all the oids above. If you had left it off, you would have gotten an error. Note that the errrors differ slightly between SNMPv1 and SNMPv2c:

```
snmpget -v 1 -c public 10.0.1.2 sysUpTime

snmpget -v 2c -c public 10.0.1.2 sysUpTime
```

snmpget -v 2c -c public 10.0.1.2 sysUpTime.0 ucdDemoUserList.0



```
[root@mlb-dc1-centos7 ~]# snmpget -v 1 -c public 10.0.1.2 system.sysUpTime.0
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (219792) 0:36:37.92
[root@mlb-dc1-centos7 ~]# snmpget -v 2c -c public 10.0.1.2 system.sysUpTime.0

DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (221713) 0:36:57.13
[root@mlb-dc1-centos7 ~]#
[root@mlb-dc1-centos7 ~]# snmpget -v 1 -c public 10.0.1.2 sysUpTime

Error in packet
Reason: (noSuchName) There is no such variable name in this MIB.
Failed object: SNMPv2-MIB::sysUpTime

[root@mlb-dc1-centos7 ~]#
[root@mlb-dc1-centos7 ~]# snmpget -v 2c -c public 10.0.1.2 sysUpTime
SNMPv2-MIB::sysUpTime = No Such Instance currently exists at this OID
[root@mlb-dc1-centos7 ~]# snmpget -v 2c -c public 10.0.1.2 sysUpTime.0 ucdDemoUserList.0

DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (229451) 0:38:14.51
UCD-DEMO-MIB::ucdDemoUserList.0 = No Such Object available on this agent at this OID
[root@mlb-dc1-centos7 ~]#
[root@mlb-dc1-centos7 ~]#
```

Snmpgetnext :retrieving unknown indexed data

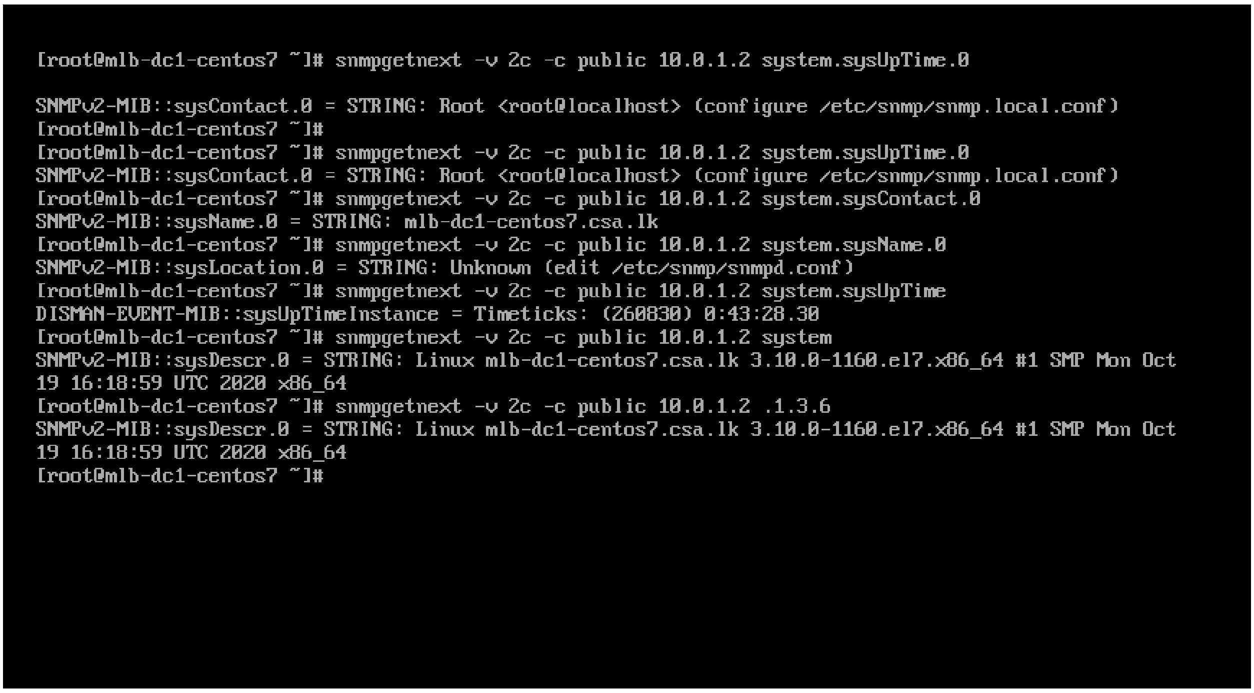
The snmpgetnext command, which is similar in usage to the snmpget command, is used to retrieve the next oid in the mib tree of data. Instead of returing the data you requested, it returns the next OID in the tree and its value

Unlike the snmpget command, the snmpgetnext command does return data for a OID which is too short or is missing the index part of the OID. For instance, if you remember from the last snmpget discussion, if you left off the .0 on the end of the OID you were requesting on a snmpget command, you were issued an error. With snmpgetnext, you're still issued an answer, because you will always get the next value in the tree, regardless of whether or not you specified a valid OID for a variable or not:

```
snmpgetnext -v 2c -c public 10.0.1.2 system.sysUpTime.0
```

You could use the snmpgetnext command to manually walk down the mib tree in the remote host, by always specifying the last OID that you saw on the command line for the next command:

```
snmpgetnext -v 2c -c public 10.0.1.2 system.sysUpTime.0
snmpgetnext -v 2c -c public 10.0.1.2 system.sysContact.0

snmpgetnext -v 2c -c public 10.0.1.2 system.sysName.0


snmpgetnext -v 2c -c public 10.0.1.2 system.sysUpTime
snmpgetnext -v 2c -c public 10.0.1.2 system

snmpgetnext -v 2c -c public 10.0.1.2 .1.3.6
```



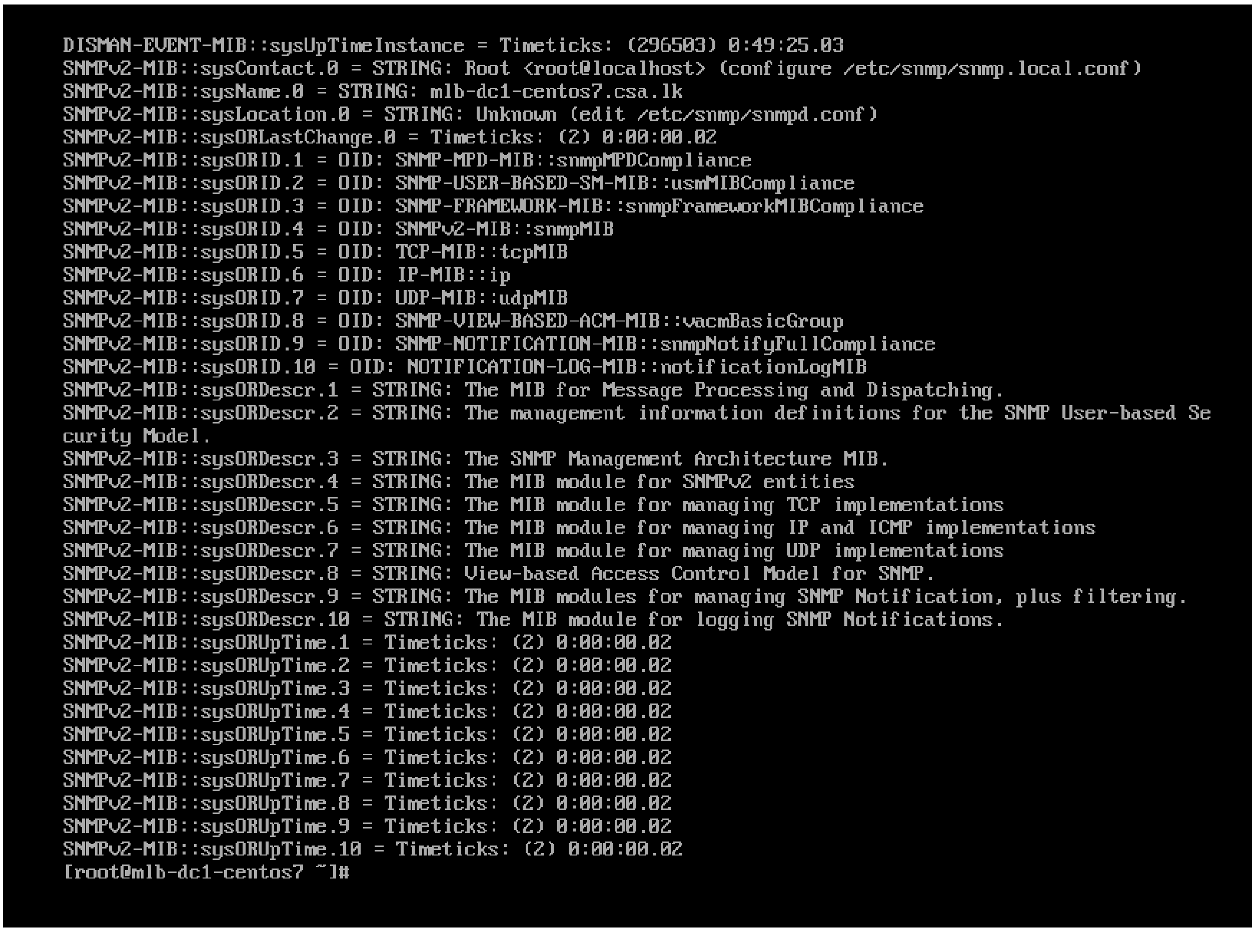
```
[root@mlb-dc1-centos7 ~]# snmpgetnext -v 2c -c public 10.0.1.2 system.sysUpTime.0

SNMPv2-MIB::sysContact.0 = STRING: Root <root@localhost> (configure /etc/snmp/snmp.local.conf)
[root@mlb-dc1-centos7 ~]#
[root@mlb-dc1-centos7 ~]# snmpgetnext -v 2c -c public 10.0.1.2 system.sysUpTime.0
SNMPv2-MIB::sysContact.0 = STRING: Root <root@localhost> (configure /etc/snmp/snmp.local.conf)
[root@mlb-dc1-centos7 ~]# snmpgetnext -v 2c -c public 10.0.1.2 system.sysContact.0
SNMPv2-MIB::sysName.0 = STRING: mlb-dc1-centos7.csa.lk
[root@mlb-dc1-centos7 ~]# snmpgetnext -v 2c -c public 10.0.1.2 system.sysName.0
SNMPv2-MIB::sysLocation.0 = STRING: Unknown (edit /etc/snmp/snmpd.conf)
[root@mlb-dc1-centos7 ~]# snmpgetnext -v 2c -c public 10.0.1.2 system.sysUpTime
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (260830) 0:43:28.30
[root@mlb-dc1-centos7 ~]# snmpgetnext -v 2c -c public 10.0.1.2 system
SNMPv2-MIB::sysDescr.0 = STRING: Linux mlb-dc1-centos7.csa.lk 3.10.0-1160.el7.x86_64 #1 SMP Mon Oct
19 16:18:59 UTC 2020 x86_64
[root@mlb-dc1-centos7 ~]# snmpgetnext -v 2c -c public 10.0.1.2 .1.3.6
SNMPv2-MIB::sysDescr.0 = STRING: Linux mlb-dc1-centos7.csa.lk 3.10.0-1160.el7.x86_64 #1 SMP Mon Oct
19 16:18:59 UTC 2020 x86_64
[root@mlb-dc1-centos7 ~]#
```

SELF STUDY

10) Tryout snmpwalk, snmptable, snmpset, snmptrap functions by yourself.

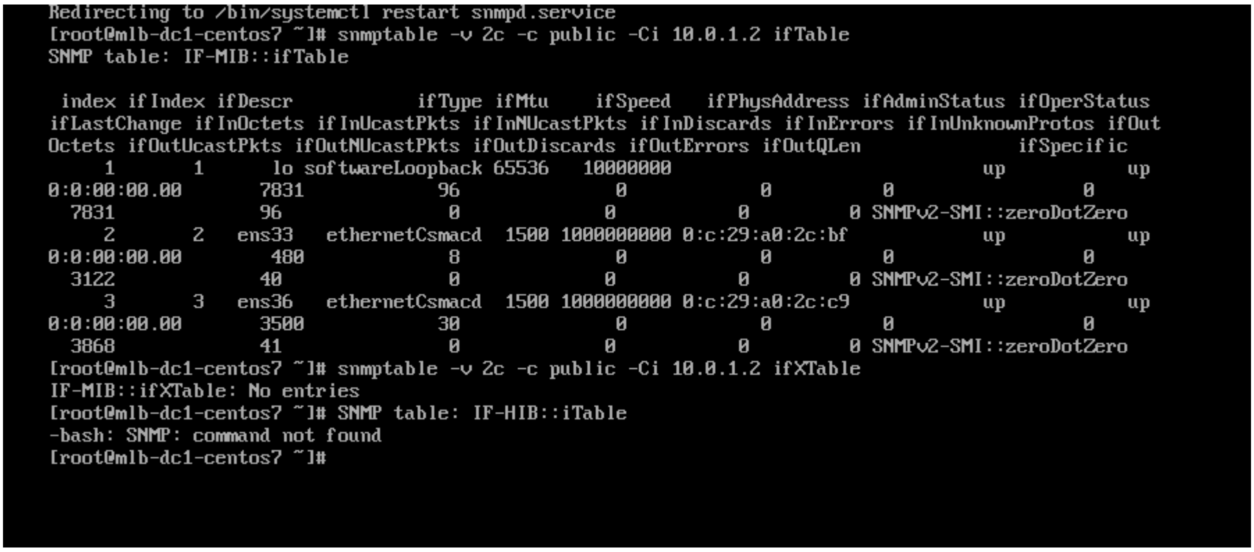
In fact, the snmpwalk command described in the next section, implements exactly this but in one command.

Snmpwalk-Retrieve all available OIDs under a specified branch



```
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (296503) 0:49:25.03
SNMPv2-MIB::sysContact.0 = STRING: Root <root@localhost> (configure /etc/snmp/snmp.local.conf)
SNMPv2-MIB::sysName.0 = STRING: mlb-dc1-centos7.csa.lk
SNMPv2-MIB::sysLocation.0 = STRING: Unknown (edit /etc/snmp/snmpd.conf)
SNMPv2-MIB::sysORLastChange.0 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORID.1 = OID: SNMP-MPD-MIB::snmpMPDCompliance
SNMPv2-MIB::sysORID.2 = OID: SNMP-USER-BASED-SM-MIB::usmMIBCompliance
SNMPv2-MIB::sysORID.3 = OID: SNMP-FRAMEWORK-MIB::snmpFrameworkMIBCompliance
SNMPv2-MIB::sysORID.4 = OID: SNMPv2-MIB::snmpMIB
SNMPv2-MIB::sysORID.5 = OID: TCP-MIB::tcpMIB
SNMPv2-MIB::sysORID.6 = OID: IP-MIB::ip
SNMPv2-MIB::sysORID.7 = OID: UDP-MIB::udpMIB
SNMPv2-MIB::sysORID.8 = OID: SNMP-VIEW-BASED-ACM-MIB::vacmBasicGroup
SNMPv2-MIB::sysORID.9 = OID: SNMP-NOTIFICATION-MIB::snmpNotifyFullCompliance
SNMPv2-MIB::sysORID.10 = OID: NOTIFICATION-LOG-MIB::notificationLogMIB
SNMPv2-MIB::sysORDescr.1 = STRING: The MIB for Message Processing and Dispatching.
SNMPv2-MIB::sysORDescr.2 = STRING: The management information definitions for the SNMP User-based Se
curity Model.
SNMPv2-MIB::sysORDescr.3 = STRING: The SNMP Management Architecture MIB.
SNMPv2-MIB::sysORDescr.4 = STRING: The MIB module for SNMPv2 entities
SNMPv2-MIB::sysORDescr.5 = STRING: The MIB module for managing TCP implementations
SNMPv2-MIB::sysORDescr.6 = STRING: The MIB module for managing IP and ICMP implementations
SNMPv2-MIB::sysORDescr.7 = STRING: The MIB module for managing UDP implementations
SNMPv2-MIB::sysORDescr.8 = STRING: View-based Access Control Model for SNMP.
SNMPv2-MIB::sysORDescr.9 = STRING: The MIB modules for managing SNMP Notification, plus filtering.
SNMPv2-MIB::sysORDescr.10 = STRING: The MIB module for logging SNMP Notifications.
SNMPv2-MIB::sysORUpTime.1 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.2 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.3 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.4 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.5 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.6 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.7 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.8 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.9 = Timeticks: (2) 0:00:00.02
SNMPv2-MIB::sysORUpTime.10 = Timeticks: (2) 0:00:00.02
[root@mlb-dc1-centos7 ~]#
```

Snmptable-Display SNMP tables in readable format



```
Redirecting to /bin/systemctl restart snmpd.service
[root@mlb-dc1-centos7 ~]# snmptable -v 2c -c public -Ci 10.0.1.2 ifTable
SNMP table: IF-MIB::ifTable

 index ifIndex ifDescr           ifType ifMtu    ifSpeed   ifPhysAddress ifAdminStatus ifOperStatus
ifLastChange ifInOctets ifInUcastPkts ifInNUcastPkts ifInDiscards ifInErrors ifInUnknownProtos ifOut
Octets ifOutUcastPkts ifOutNUcastPkts ifOutDiscards ifOutErrors ifOutQLen              ifSpecific
     1       1      lo softwareLoopback 65536   10000000                            up           up
0:0:00:00.00       7831            96              0            0          0                0
  7831             96               0             0           0         0 SNMPv2-SMI::zeroDotZero
     2       2   ens33   ethernetCsmacd  1500 1000000000 0:c:29:a0:2c:bf            up           up
0:0:00:00.00        480             8              0            0          0                0
  3122             40               0             0           0         0 SNMPv2-SMI::zeroDotZero
     3       3   ens36   ethernetCsmacd  1500 1000000000 0:c:29:a0:2c:c9            up           up
0:0:00:00.00       3500            30              0            0          0                0
  3868             41               0             0           0         0 SNMPv2-SMI::zeroDotZero
[root@mlb-dc1-centos7 ~]# snmptable -v 2c -c public -Ci 10.0.1.2 ifXTable
IF-MIB::ifXTable: No entries
[root@mlb-dc1-centos7 ~]# SNMP table: IF-HIB::iTable
-bash: SNMP: command not found
[root@mlb-dc1-centos7 ~]#
```

snmpset - Modify Values
(Purpose: Change writable SNMP objects)

Usage Scenario:
Update device location information remotely.

snmptrap - Event Notification
(Purpose: Send alerts to SNMP manager)

Usage Scenario:
Send critical event notifications to NMS.

Conclusion

This comprehensive practical exercise successfully demonstrated SNMP's critical role in network management through hands-on configuration and operation. The implementation of snmpget, snmpwalk, and snmptrap commands validated theoretical concepts from SLIIT's NDM curriculum, particularly regarding OID hierarchies and community-based security models. Students acquired essential skills in CentOS SNMP service deployment, MIB tree navigation, and network monitoring configuration. These competencies directly support SLIIT's learning outcomes for enterprise network administration, preparing students for real-world network management challenges. The lab's successful completion underscores SNMP's continued relevance in modern network operations.

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