Device Modelling Checklist

To be successful with modelling a device you need a few things before you start.

Once you have this in hand checkout the more detailed device modelling documentation here: Developing Device Models for NMIS

Device Modelling Preparation

Device Access

You can model a device without having one, but it is REALLY HARD, having SNMP readonly access to a device is vital for success.

SNMP MIBS

You will need to have all the necessary standard (IETF/IEEE) MIBs and the vendor specific MIBs for the device to be modelled.

SNMPWALK (SNMP Dump)

Once you have the MIBs the best way to interpret the MIBs is to complete an SNMP WALK of the device, first verify that you can use SNMP to access the device see the following article: Testing SNMP Connectivity from the NMIS Server with snmpwalk

Then you need to do a full SNMP WALK, you will need to create a directory to store the MIBs in, for example ~/mibs, then copy the MIBs you obtained for the product and copy them to that folder, you will also need the standard MIBs, which are included in the NMIS distribution in /usr/local/nmis8/mibs/traps, copy these to the same folder, now verify that everything is working, you may get some errors from SNMP WALK about mib compiling, but you can usually ignore those if you get a good output.

For devices with proprietary MIB's or Enterprise MIBS, you should obtain them from the vendor, Google is very helpful and add them to your MIB's in ~/mibs, before doing the SNMP walk.

For a large collection of MIB files which have been error corrected, you can find many MIBS on Keith Sinclair's GitHub MIB Repo

Commands to run:

```
mkdir ~/mibs
cp <vendor mib file(s)> ~/mibs
cp /usr/local/nmis8/mibs/traps/* ~/mibs
snmpwalk -m ALL -M ~/mibs -v 2c -c GOODCOMMUNITY <HOSTNAME or IP ADDRESS> system
```

Expected output:

```
SNMPv2-MIB::sysDescr.0 = STRING: Hardware: Intel64 Family 6 Model 15 Stepping 6 AT/AT COMPATIBLE - Software:
Windows Version 6.1 (Build 7601 Multiprocessor Free)SNMPv2-MIB::sysObjectID.0 = OID: SNMPv2-SMI::enterprises.
311.1.1.3.1.1
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (40604629) 4 days, 16:47:26.29
SNMPv2-MIB::sysContact.0 = STRING: dc_admin@opmantek.com
SNMPv2-MIB::sysName.0 = STRING: kaos
SNMPv2-MIB::sysLocation.0 = STRING: Head Office
SNMPv2-MIB::sysServices.0 = INTEGER: 79
```

Run a full walk and redirect to a file, note that you can use snmpbulkwalk on many devices when using SNMPv2C, this greatly improves the speed of collection on very large devices.

```
snmpwalk -m ALL -M ~/mibs -v 2c -c GOODCOMMUNITY <HOSTNAME or IP ADDRESS> .1 > ~/VENDOR-Product.mib

or

snmpbulkwalk -m ALL -M ~/mibs -v 2c -c GOODCOMMUNITY <HOSTNAME or IP ADDRESS> .1 > ~/VENDOR-Product.mib
```

Now you have an SNMP Dump.

Goal for Modelling

What is the goal for the modelling? Just standard type support, or more advanced collection, do you want to collect some performance data about how a protocol is operating, or verify the number of sessions a firewall is running.

Sometimes you can find the source MIB in the documentation or a whitepaper, but sometimes it is very difficult to determine where the needed data is stored. If possible ask a product expert who is familiar with that specific product.

Device Instrumentation

Many times, people want to graph CPU and Memory, but not all devices support the collection of this information, you can only ask NMIS to collect something which the device has the instrumentation for, the MIBs should tell you if it is possible.

Relevance of Instrumentation

For Cisco routers, it is very handy to monitor CPU load, it is an excellent metric for how the device is performing, however on some newer Cisco devices, the processing is distributed and performed in hardware, so the CPU load is still handy but it may not be providing the information you need.

Verify the MIB Operation

Now you know what you want to collect and monitor, verify that the MIB operates the way the documentation says it does and verify that it works they way you think it does.

Techniques for Modelling

Now you know what you want to model, you will need to decide to use the system or systemHealth techniques for having NMIS collect and store the data, you will also want to decide if you want any custom alarms configured.

This page has great information about Modelling MIBS that use Indexes using the systemHealth section.