Purpose

This document describes how to use the SNMP Walk Wizard, it briefly explains SNMP and how to reference a MIB file or OID. SNMP is the acronym for Simple Network Management Protocol. An SNMP Walk is when the Nagios XI server scans a device to see what SNMP objects are available for monitoring.

SNMP Walk Explained

An SNMP Walk refers to an operating system program that queries a device to see what SNMP objects are available for monitoring.

If you perform an SNMP Walk on a Linux Operating system you will receive 3500+ results, which is probably more than what you need. So how exactly do you know what is available on your device to be monitored, without seeing 3500+ results? Before that can be answered, a brief SNMP explanation is required (without getting too involved):

- SNMP is based on Object Identifiers (OIDs),
  - This is an unambiguous persistent name like 1.3.6.1.4.1.343
  - Explained clearly on Wikipedia: https://en.wikipedia.org/wiki/Object_identifier
  - Identifiers like this do nothing to describe/identify their use.
- Management Information Base (MIB)
  - A MIB is a database that correlates OIDs to an understandable format
  - A manufacturer of a device like a router or UPS can provide you with a MIB file that explains what SNMP OIDs are available on that device.

Your Nagios XI server has SNMP modules installed on it and comes with the standard MIB files that are bundled with the SNMP modules. These MIB files are a collection of the most common generic objects that are implemented in devices running SNMP.
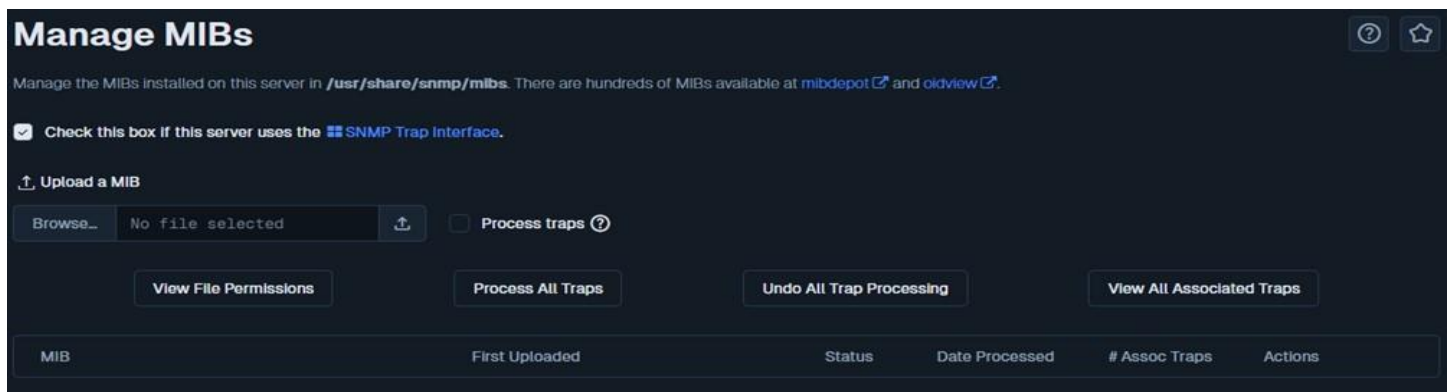
Going back to the question posed earlier, how exactly do you know what is available on your device to be monitored, without seeing 3500+ results? The manufacturer of your device will normally make available a MIB file that is specific to that device. The manufacturers MIB file provides detailed information on the SNMP objects that this device allows you to query.

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For this documentation to be easily understood, we are going to use one of the MIB files that comes with the Nagios XI server. By using this MIB file you will be able to reproduce what this documentation is demonstrating and then you will be able to understand a MIB file for your specific device.

Managing MIB Files

Nagios XI has a dedicated section for managing MIB files. Navigate to **Admin > System Extensions > Manage MIBs**.


You can use the **Browse and Upload MIB** buttons to upload your own MIBs. Understanding how to read a MIB file can help you get the most out of the SNMP Walk wizard, however it's not required knowledge at this point. The Understanding MIB Files And Objects section in this documentation does explain how to read a MIB file which may be of some help.
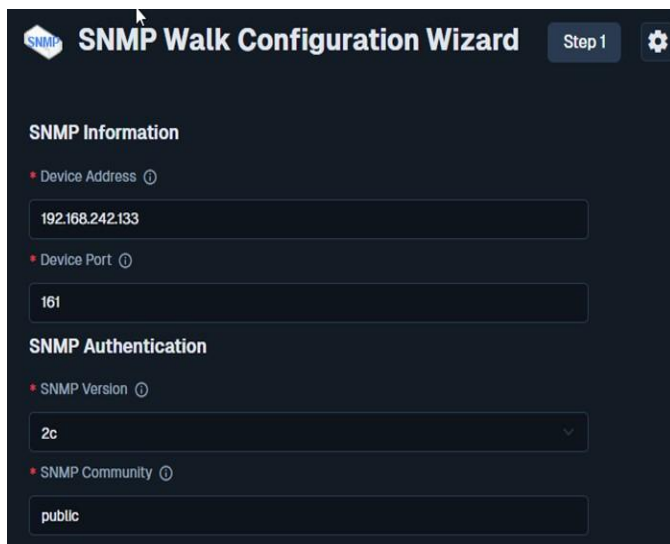
SNMP Walk Wizard

In Nagios XI navigate to **Configure > Configuration Wizards** and select the **SNMP Walk** wizard. In the following screenshot you can see how the search field allows you to quickly find a wizard.
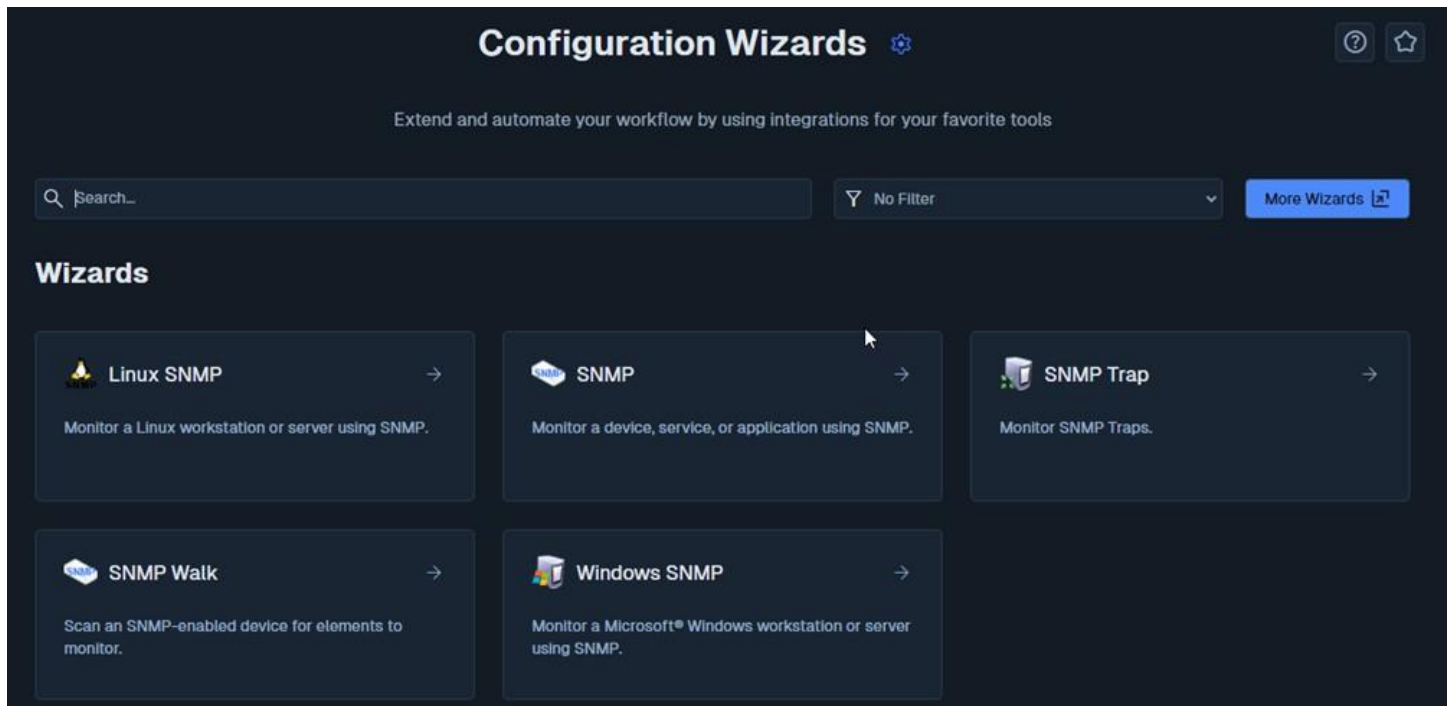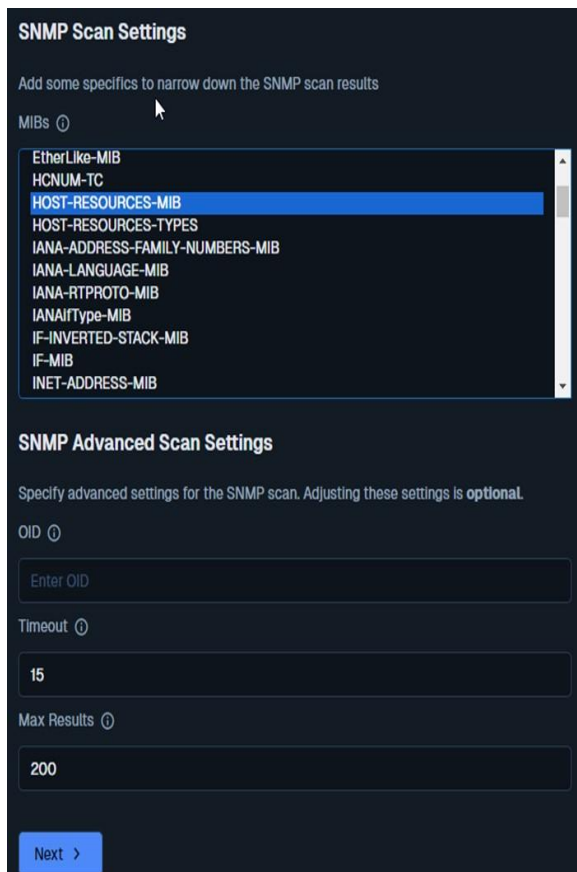

1. **Step 1** you will be asked to supply the address of the device you will run the **SNMP Walk** against as well as the port.
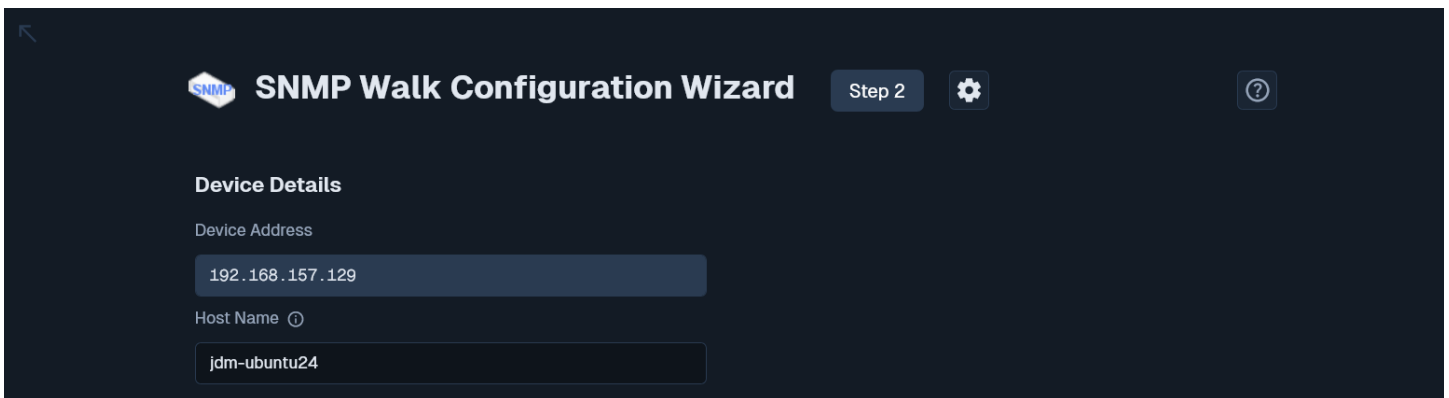
a. You need to select the appropriate SNMP Version; this screenshot shows SNMP v2c settings.

b. Nagios XI has some limitations on the characters allowed in the SNMP Community field, please refer to this KB article for more information: Nagios XI - Special Characters

c. This screenshot shows SNMP v3 settings.

d. Nagios XI has some limitations on the characters allowed in the **Password** fields, please refer to this KB article for more information: Nagios XI - Special Characters

e. The device being used in this documentation is a CentOS server that accepts SNMP requests. This is purely to make this documentation reproducible for you to test. For detailed instructions on how to configure CentOS to accept SNMP requests please refer to the following documentation: Monitoring Linux Using SNMP

f.   The final settings available are the **SNMP Scan Settings**. These are optional settings. However, to demonstrate the capabilities of the wizard we will choose some options.

g.   The MIBs list allows you to limit the results of your scan to one or more MIB files. In this example I have chosen the HOST-RESOURCES-MIB file.

h.   We are also going to further limit the results by only selecting objects under the host.hrSystem MIB tree, more information on this can be located in the Understanding MIB Files And Objects section of this documentation. Click **Next** to progress to **Step 2**.

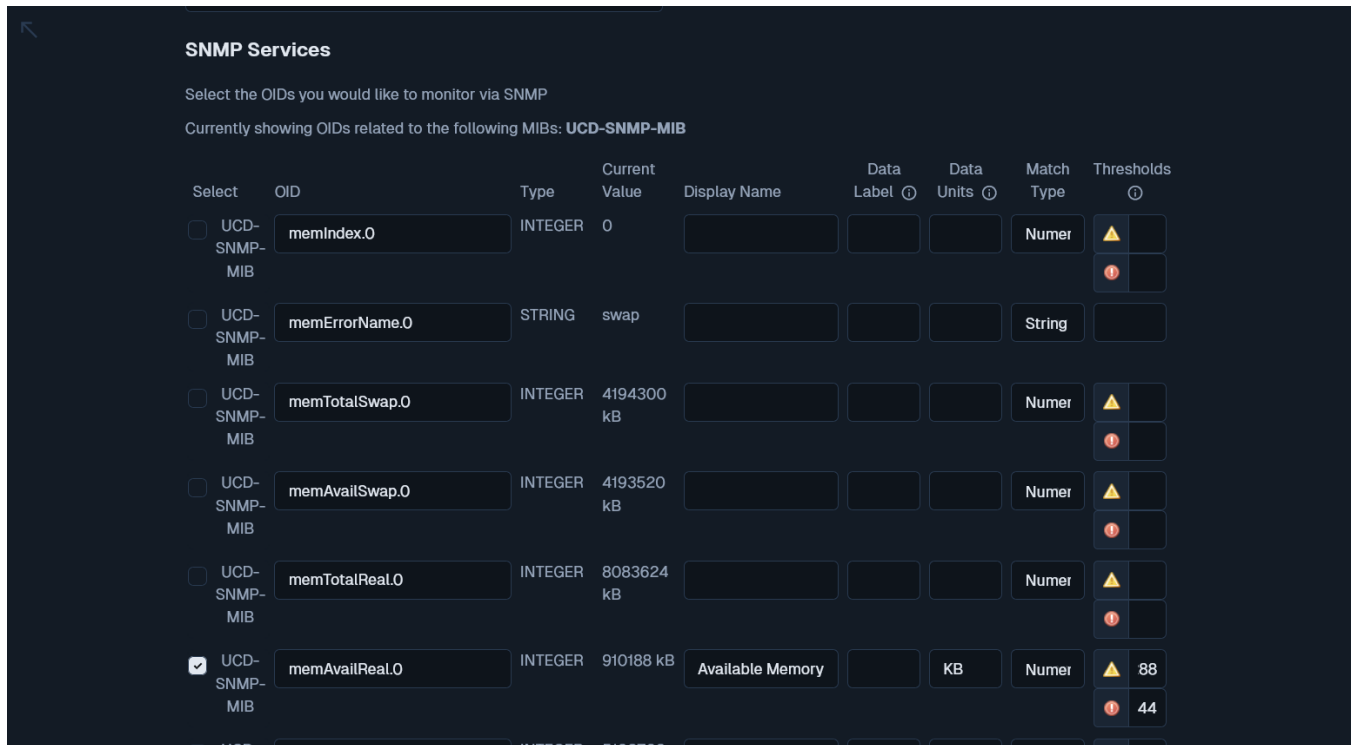2.   When you proceed to **Step 2**, the wizard will perform the **SNMP Walk** against the device based on the settings you provided on **Step 1**.

a.   Make sure the **Host Name** field has a value that easily identifies this device.

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b. The results of the **SNMP Walk** will be displayed in a table with various fields. The following screenshots show two different objects selected to be monitored.

c. In the screenshot above, the memAvailReal.0 OID has been selected to be monitored.

  i. The checkbox in the left column is how you select this item to be monitored

  ii. The **Display Name** field has been populated with **Available Memory**; this is how the service will be named.

  iii. memAvailReal.0 is a measurement of Kilobytes, 524288 = 512MB.

  iv. This service is being created so that it will go into a critical state when the device has less than 256MB of free available memory. To do this:

    1. Match Type = Numeric

    2. Warning = 524288

    3. Critical = 262144

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More information on warning and critical thresholds can be found on the Nagios Plugin Development Guidelines page: https://nagios-plugins.org/doc/guidelines.html#THRESHOLDFORMAT
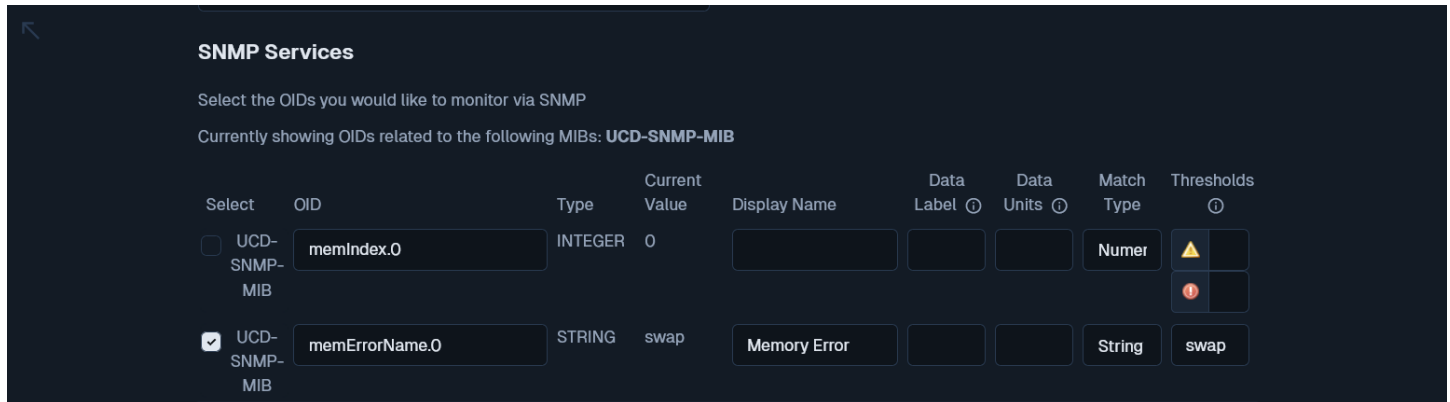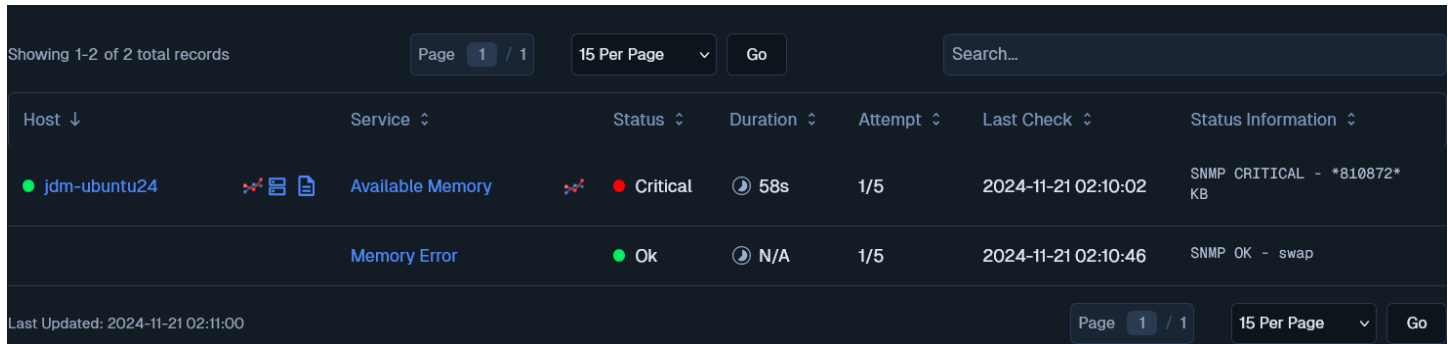
Here is another example that demonstrates checking a string.

In the screenshot above, the memErrorName.0 OID has been selected to be monitored.

d. The purpose of this example is to demonstrate how you can check a string to ensure it to set to the correct value. You might have strict change controls in place and want to make sure a specific Linux boot image has been used to boot the operating system.

e. Match Type = String

f. String To Match = swap

g. With these options, if the memory error changes the service will go into a critical state.

3. Once you've finished selecting all the items you wish to monitor click **Next** and then complete the wizard by choosing the required options in **Step 3 - Step 5**.

4. To finish up, click on **Finish** in the final step of the wizard. This will create new hosts and services and begin monitoring.

Once the wizard applies the configuration, click the **View status** details for <your device> link to see the new host and services that were created.

Showing 1-2 of 2 total records			Page 1 / 1	15 Per Page	Go		Search...		
Host ↓			Service ↕	Status ↕	Duration ↕	Attempt ↕	Last Check ↕	Status Information ↕
● jdm-ubuntu24			Available Memory	● Critical	ⓘ 58s	1/5	2024-11-21 02:10:02	SNMP CRITICAL - *810872* KB
			Memory Error	● Ok	ⓘ N/A	1/5	2024-11-21 02:10:46	SNMP OK - swap
Last Updated: 2024-11-21 02:11:00						Page 1 / 1	15 Per Page	Go

The available memory status check shows critical as the available memory is below the defined critical threshold, while the Memory Error check shows OK; as the status check returned the string "swap".

This demonstrates how the thresholds defined when running the wizard can generate alerts.
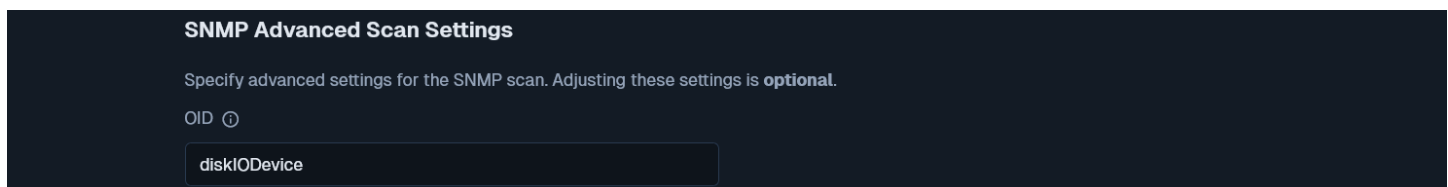
This completes configuring Nagios XI to monitor a device using the SNMP Walk wizard.

Understanding MIB Files And Objects

In this documentation we used the HOST-RESOURCES-MIB MIB file to limit the SNMP walk. From the **Manage MIBs** Page you can locate this file in the list and then click the **Download** [⬇] icon.

You will be prompted to download the file, once downloaded open the file in a text editor like Notepad.

The contents of the MIB file will be explained shortly, but first a screenshot from the SNMP Walk wizard to understand what the next topic will be about.

SNMP Advanced Scan Settings

Specify advanced settings for the SNMP scan. Adjusting these settings is **optional**.

OID ⓘ

diskIODevice

On **Step 1** of the wizard there is a field labeled OID and is not populated by default. When this field is empty the wizard will scan for all private OIDs on the device, however this may yield more results than necessary. In the example above you can see the value diskIODevice has been used to define where the scan will begin in the MIB tree.

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Understanding what value to populate in this field is where the MIB file comes into play. When you look at the MIB file, any line that contains "`OBJECT IDENTIFIER ::=`" will start with a label that identifies a hierarchical level in the MIB tree. Here are some examples:

```
diskIODevice OBJECT-TYPE    ::=          { diskIOEntry 2 }
```

Generally, but not always, the objects in the file are hierarchical as the file continues. In the curly brackets to the right is an identification as to which object this one resides under. You can see that hrSystem resides under the host object, the same as how the host object resides under the mib-2 object.

In the wizard, the object can be referenced different ways, such as:

```
diskIODevice
diskIOEntry -2.diskIODevice
```

When the SNMP Walk is performed, the MIB files on your Nagios XI server are searched for the requested object. When it finds that object it will then execute the SNMP Walk. As you can imagine, using an object like host may exist in different MIB files and you might not get the desired results. Whereas `diskIOEntry -2.diskIODevice` is more specific and likely to query the correct objects.

When looking at the MIB file you will have noticed that it's not that easy to read, for example:

```
diskIODevice OBJECT-TYPE
            SYNTAX      DisplayString
            MAX-ACCESS  read-only
            STATUS      current
            DESCRIPTION
                "The name of the device we are counting/checking."
            ::= { diskIOEntry 2 }
```

If you want to get a list of all the objects in a MIB file you can execute a command to do this. All the MIB files are in the `/usr/share/snmp/mibs` directory.

Establish a terminal session to your Nagios XI server and execute the following command:

```
snmptranslate -Ts -m /usr/share/snmp/mibs/UCD-DISKIO-MIB.txt
```

Here is an extract from that output:

```
.iso.org.dod.internet.private.enterprises.ucdavis.ucdExperimental.ucdDiskIOM
IB.diskIOTable
```

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```
.iso.org.dod.internet.private.enterprises.ucdavis.ucdExperimental.ucdDiskIOM
IB.diskIOTable.diskIOEntry
.iso.org.dod.internet.private.enterprises.ucdavis.ucdExperimental.ucdDiskIOM
IB.diskIOTable.diskIOEntry.diskIOIndex
.iso.org.dod.internet.private.enterprises.ucdavis.ucdExperimental.ucdDiskIOM
IB.diskIOTable.diskIOEntry.diskIODevice
.iso.org.dod.internet.private.enterprises.ucdavis.ucdExperimental.ucdDiskIOM
IB.diskIOTable.diskIOEntry.diskIONRead
.iso.org.dod.internet.private.enterprises.ucdavis.ucdExperimental.ucdDiskIOM
IB.diskIOTable.diskIOEntry.diskIONWritten
.iso.org.dod.internet.private.enterprises.ucdavis.ucdExperimental.ucdDiskIOM
IB.diskIOTable.diskIOEntry.diskIOReads
.iso.org.dod.internet.private.enterprises.ucdavis.ucdExperimental.ucdDiskIOM
IB.diskIOTable.diskIOEntry.diskIOWrites
```

An OID can also be specified in the wizard, you can get a list of all OIDs by executing the following command:

```
snmptranslate -Tz -m /usr/share/snmp/mibs/HOST-RESOURCES-MIB.txt
```

Here is an extract from that output:

```
"diskIOTable"              "1.3.6.1.4.1.2021.13.15.1"
"diskIOEntry"              "1.3.6.1.4.1.2021.13.15.1.1"
"diskIOIndex"              "1.3.6.1.4.1.2021.13.15.1.1.1"
"diskIODevice"             "1.3.6.1.4.1.2021.13.15.1.1.2"
"diskIONRead"              "1.3.6.1.4.1.2021.13.15.1.1.3"
"diskIONWritten"           "1.3.6.1.4.1.2021.13.15.1.1.4"
"diskIOReads"              "1.3.6.1.4.1.2021.13.15.1.1.5"
"diskIOWrites"             "1.3.6.1.4.1.2021.13.15.1.1.6"
```

This completes the section on understanding MIB files and objects.

More Information:

[Using Configuration Wizards](#)

Finishing Up

This completes the documentation on using the SNMP Walk wizard in Nagios XI. If you have additional questions or other support-related questions, please visit us at our Nagios Support Forum, Nagios Knowledge Base, or Nagios Library:

Visit Nagios Support Forum   Visit Nagios Knowledge Base   Visit Nagios Library