

SNMP Integrator Guide

Operations Center 5.5

November 18, 2014

Legal Notices

THIS DOCUMENT AND THE SOFTWARE DESCRIBED IN THIS DOCUMENT ARE FURNISHED UNDER AND ARE SUBJECT TO THE TERMS OF A LICENSE AGREEMENT OR A NON-DISCLOSURE AGREEMENT. EXCEPT AS EXPRESSLY SET FORTH IN SUCH LICENSE AGREEMENT OR NON-DISCLOSURE AGREEMENT, NETIQ CORPORATION PROVIDES THIS DOCUMENT AND THE SOFTWARE DESCRIBED IN THIS DOCUMENT "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SOME STATES DO NOT ALLOW DISCLAIMERS OF EXPRESS OR IMPLIED WARRANTIES IN CERTAIN TRANSACTIONS; THEREFORE, THIS STATEMENT MAY NOT APPLY TO YOU.

For purposes of clarity, any module, adapter or other similar material ("Module") is licensed under the terms and conditions of the End User License Agreement for the applicable version of the NetIQ product or software to which it relates or interoperates with, and by accessing, copying or using a Module you agree to be bound by such terms. If you do not agree to the terms of the End User License Agreement you are not authorized to use, access or copy a Module and you must destroy all copies of the Module and contact NetIQ for further instructions.

This document and the software described in this document may not be lent, sold, or given away without the prior written permission of NetIQ Corporation, except as otherwise permitted by law. Except as expressly set forth in such license agreement or non-disclosure agreement, no part of this document or the software described in this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, or otherwise, without the prior written consent of NetIQ Corporation. Some companies, names, and data in this document are used for illustration purposes and may not represent real companies, individuals, or data.

This document could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein. These changes may be incorporated in new editions of this document. NetIQ Corporation may make improvements in or changes to the software described in this document at any time.

U.S. Government Restricted Rights: If the software and documentation are being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the government's rights in the software and documentation, including its rights to use, modify, reproduce, release, perform, display or disclose the software or documentation, will be subject in all respects to the commercial license rights and restrictions provided in the license agreement.

© 2014 NetIQ Corporation. All Rights Reserved.

For information about NetIQ trademarks, see https://www.netiq.com/company/legal/ (https://www.netiq.com/company/legal/).

All third-party trademarks are the property of their respective owners.

Contents

About This Guide 5

1 Overview 7

2 SNMP Integration Adapter 9

2.1 Supported SNMP Versions . . . 9
2.2 Supported Java Runtime Environment Requirements . . . 10
2.3 SNMP Adapter Database Requirements . . . 10
2.4 Creating an SNMP Adapter . . . 10
2.5 Starting the Adapter Manually . . . 11
2.6 Stopping the Adapter . . . 11
2.7 Modifying the Adapter Properties . . . 12
2.8 Checking SNMP Adapter Status . . . 12
2.9 Deleting an Adapter . . . 13

3 The Model Repository 15

3.1 Importing Management Information Bases (MIBs) . . . 15
3.1.1 Viewing a List of MIB Modules . . . 16
3.1.2 Understanding the MIB Database . . . 16
3.1.3 Importing a MIB Database . . . 17
3.1.4 Browsing for a MIB . . . 18
3.1.5 Finding a MIB . . . 18
3.1.6 Removing a MIB from the Database . . . 19
3.2 Managing a Model Repository Structure . . . 19
3.2.1 Browsing the Model Repository . . . 20
3.2.2 Creating Repository Containers . . . 20
3.2.3 Creating Repository Collectors . . . 21
3.2.4 Creating Repository Branches . . . 25
3.2.5 Removing Containers, Collectors, and Branches . . . 26

4 SNMP Hosts and Devices 27

4.1 Adding Hosts/Devices . . . 27
4.1.1 Adding a Host or Device Manually . . . 29
4.1.2 Discovering Hosts/Devices . . . 30
4.2 Managing Hosts/Devices . . . 31
4.3 Finding a Host . . . 31
4.4 Removing Hosts . . . 31
4.4.1 Removing a Host . . . 32
4.4.2 Removing Multiple Hosts . . . 32
4.5 Changing the Host/Device Community . . . 32
4.6 Polling a Host/Device . . . 33

5 Communication & Protocol Settings 35

5.1 Configuring Global Communication & Protocol Settings . . . 35
5.2 Overriding Global Communication Settings . . . 36

5.3 Overriding Global Protocol Settings 36

About This Guide

The *SNMP Integrator Guide* covers the features of the Operations Center SNMP adapter that allow you to poll, gather, and view data available on SNMP agents while you work in the Operations Center console.

- Chapter 1, "Overview," on page 7
- Chapter 2, "SNMP Integration Adapter," on page 9
- Chapter 3, "The Model Repository," on page 15
- Chapter 4, "SNMP Hosts and Devices," on page 27
- Chapter 5, "Communication & Protocol Settings," on page 35

Audience

This guide is intended for Operations Center system administrators.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the *User Comments* feature at the bottom of each page of the online documentation.

Additional Documentation & Documentation Updates

This guide is part of the Operations Center documentation set. For the most recent version of the *SNMP Integrator Guide* and a complete list of publications supporting Operations Center, visit our Online Documentation Web Site at Operations Center 5.5 online documentation.

The Operations Center documentation set is also available as PDF files on the installation CD or ISO; and is delivered as part of the online help accessible from multiple locations in Operations Center depending on the product component.

Additional Resources

We encourage you to use the following additional resources on the Web:

- NetIQ User Community (https://www.netiq.com/communities/): A Web-based community with a variety of discussion topics.
- NetIQ Support Knowledgebase (https://www.netiq.com/support/kb/product.php?id=SG_XOPERATIONSCENTER_1_2): A collection of in-depth technical articles.
- NetIQ Support Forums (https://forums.netiq.com/forumdisplay.php?26-Operations-Center): A Web location where product users can discuss NetIQ product functionality and advice with other product users.

Technical Support

You can learn more about the policies and procedures of NetIQ Technical Support by accessing its Technical Support Guide (https://www.netiq.com/Support/process.asp#_Maintenance_Programs_and).

Use these resources for support specific to Operations Center:

- Telephone in Canada and the United States: 1-800-858-4000
- Telephone outside the United States: 1-801-861-4000
- E-mail: support@netiq.com (support@netiq.com)
- Submit a Service Request: http://support.novell.com/contact/ (http://support.novell.com/contact/)

Documentation Conventions

A greater-than symbol (>) is used to separate actions within a step and items in a cross-reference path. The > symbol is also used to connect consecutive links in an element tree structure where you can either click a plus symbol (+) or double-click the elements to expand them.

A trademark symbol (®, ™, etc.) denotes a NetIQ trademark. An asterisk (*) denotes a third-party trademark.

When a single pathname can be written with a backslash for some platforms or a forward slash for other platforms, the pathname is presented with a forward slash to preserve case considerations in the UNIX* or Linux* operating systems.

1 Overview

Adapters are configured with a one-to-one relationship, where one adapter talks to a specific management system. The Operations Center integration platform ships with support for many industry-standard network and systems management tools. An adapter is Operations Center' interface with the management systems in your network. Operations Center cannot interact with any management system until adapters are created for that system.

This guide covers the features of the Operations Center SNMP adapter that allow you to poll, gather, and view data available on SNMP agents while you work in the Operations Center console.

It is assumed that you have a good understanding of the Simple Network Management Protocol (SNMP) and how to use it to manage your equipment.

For more information, see *Essential SNMP* by Douglas Mauro and Kevin Schmidt, published by O'Reilly (ISBN: 0-596-00020-0).

2 SNMP Integration Adapter

SNMP (Simple Network Management Protocol) is a set of protocols (http://www.webopedia.com/TERM/P/protocol.html) used to manage complex networks (http://www.webopedia.com/TERM/N/network.html). SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network.

SNMP-compliant devices, called agents, are entities that interface with the actual device you want to manage. Network bridges, hubs, routers, and servers are devices that you want to manage with SNMP. These devices have managed objects, such as hardware, configuration parameters, and performance statistics.that are directly involved in current operation of the device.

- Section 2.1, “Supported SNMP Versions,” on page 9
- Section 2.2, “Supported Java Runtime Environment Requirements,” on page 10
- Section 2.3, “SNMP Adapter Database Requirements,” on page 10
- Section 2.4, “Creating an SNMP Adapter,” on page 10
- Section 2.5, “Starting the Adapter Manually,” on page 11
- Section 2.6, “Stopping the Adapter,” on page 11
- Section 2.7, “Modifying the Adapter Properties,” on page 12
- Section 2.8, “Checking SNMP Adapter Status,” on page 12
- Section 2.9, “Deleting an Adapter,” on page 13

2.1 Supported SNMP Versions

You can configure Operations Center to work with SNMP V1 Agents. Operations Center supports versions that comply with SNMP Version 1, 2c, and 3 specifications, as defined by the Internet Engineering Task Force (IETF).

2.2 Supported Java Runtime Environment Requirements

The SNMP adapter is supported for Oracle JDK.

For more information, see "Java Runtime Environment" in the *Operations Center 5.5 Getting Started Guide*.

2.3 SNMP Adapter Database Requirements

Before you can set up and run a SNMP adapter, you should have an active database definition for the Operations Center Event Data Store.

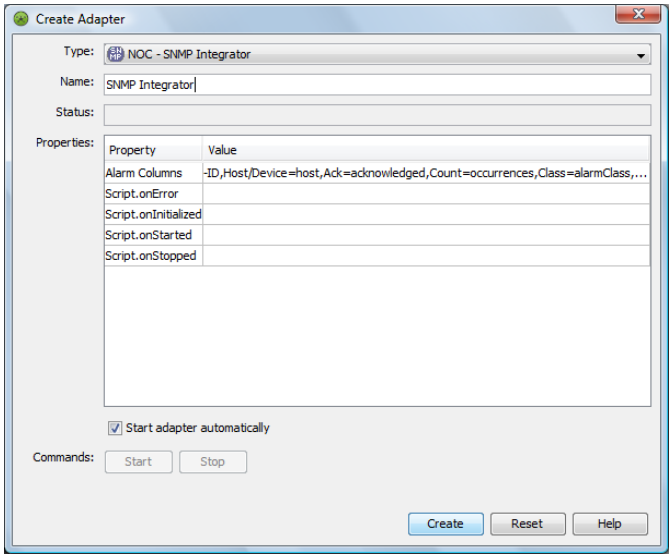
For more information regarding creating database definitions and the data warehouse, see "Creating Database Definitions, Configuring the Event Data Store, and Connecting to External Databases" in the *Operations Center 5.5 Server Configuration Guide*.

For a list of the most current versions of supported databases (for example, IBM DB2), see "Supported Databases" in the *Operations Center 5.5 Getting Started Guide*.

2.4 Creating an SNMP Adapter

To create an SNMP adapter in the Operations Center console:

1. In the *Explorer* pane, expand the *Administration* root element to display a list of its adapters.
2. Right-click *Adapters*, then select *Create Adapter* to display the Create Adapter dialog box:



3. In the dialog box, open the *Type* drop-down list, then select *NOC - SNMP Integrator*.

   The *Name* field displays a default name and the *Properties* table lists the adapter properties and values.

4 In the *Name* field, enter a meaningful adapter name in place of the default name.

For example, change:

```
Adapter: NOC - SNMP Integrator
```

to:

```
SNMP Devices Headquarters
```

If more than one adapter is created with the same name, subsequent adapters are created with a sequential number appended to the end of the name.

5 In the *Value* column of the properties table, specify values for the SNMP adapter properties:

AlarmColumns: A comma-separated list that determines which alarm columns are displayed and the order that the alarm items are displayed (source of alarm, alarm class, and so on) in the Alarms view.

For example:

```
-ID,Host/Device=host,Ack=acknowledged,Count=occurrences,Class=alarmClass,
assignedTo,message
```

We recommend that you use all of the values listed in the above example.

Script.onInitialized: A script that executes when the adapter is first initialized. All of the `Script.` properties are optional.

Script.onStarted: A script that executes whenever the adapter is started, either manually or auto-started when the Operations Center server starts.

Script.onStopped: A script that executes whenever the adapter is manually stopped.

6 To automatically start the adapter, select *Start adapter automatically*.

If the check box is not selected, you must start the adapter manually each time you start Operations Center.

7 Click *Create*, then click *Close*.

After it starts, the new SNMP adapter is added to the *Adapters* object in the *Explorer* pane.

2.5 Starting the Adapter Manually

To start the adapter:

1 In the *Explorer* pane, expand the *Administration* root element to display a list of its adapters.

2 Right-click the SNMP adapter, then select *Start Adapter*.

2.6 Stopping the Adapter

To stop the adapter:

1 In the *Explorer* pane, expand the *Administration* root element to display a list of its adapters.

2 Right-click the SNMP adapter, then select *Stop Adapter*.

2.7 Modifying the Adapter Properties

Edit the SNMP adapter properties through the adapter element property pages.

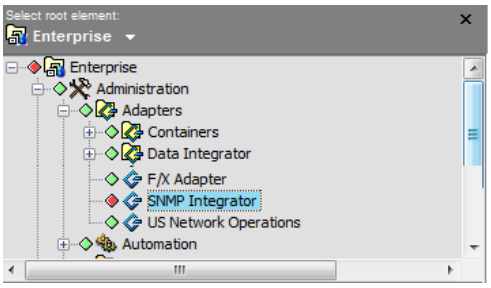
To update adapter properties, such as *Alarm Columns*, or to run scripts on adapter startup/shutdown:

1. In the *Explorer* pane, expand the *Administration* root element to display a list of its adapters.
2. Double-click the SNMP adapter name to open its *Status* property page.
3. In the left pane, click *Adapter* to open the *Adapter* property page.
4. Edit the property values, then click *Apply*.

2.8 Checking SNMP Adapter Status

The condition of the SNMP adapter is visually indicated in the *Explorer* pane, as shown in Figure 2-1:

Figure 2-1 *Adapters with Condition Indicator Icons*



The colored icons indicate the status of the adapter. You can tell at a glance if the adapter is up and running (green), or if some other status is indicated. Table 2-1 lists the color codes for adapter status.

Table 2-1 *Condition Indicator Color Key*

Color	Description
Red	The status of the associated element is CRITICAL.
Orange	The status of the associated element is MAJOR.
Yellow	When the adapter is in the process of starting or stopping, the status is MINOR.
Blue	The status of the associated element is INFORMATIONAL.
Green	When the adapter is started and running, the status is OK.
Gray	When the adapter is stopped, the status is UNKNOWN.
Brown	The status of the associated element is UNMANAGED.

To hide or display the condition indicators:

Right-click the *Explorer* pane background, then select *Show Condition Indicators* to hide or display the indicators.

2.9 Deleting an Adapter

To delete an adapter:

1. In the *Explorer* pane, expand the *Administration* root element to display a list of its adapters.
2. Right-click the SNMP adapter, then select *Delete Adapter*.

3 The Model Repository

SNMP-compliant devices, called agents, are the entities that interface with the actual devices being managed. Bridges, Hubs, Routers, or network servers are examples of managed devices. After the SNMP adapter is created, it must be configured to communicate with your SNMP agents. This step requires setting up the Model Repository. The Model Repository is a set of models that describe the data being monitored by the SNMP agents with which the SNMP adapter communicates. A model can be thought of as an object hierarchy template for structuring objects managed by the various managed devices.

The managed devices contain objects, such as hardware, configuration parameters, and performance statistics. These objects are arranged in what is known as a virtual information database, called a Management Information Base, also called MIB (http://www2.rad.com/networks/applications/snmp/main.htm#mib#mib). SNMP allows managers and agents to communicate for the purpose of accessing these objects.

- Section 3.1, “Importing Management Information Bases (MIBs),” on page 15
- Section 3.2, “Managing a Model Repository Structure,” on page 19

3.1 Importing Management Information Bases (MIBs)

A Management Information Base (MIB) is a type of information warehouse. It is a collection of metadata definitions, which define the properties of the managed object within the device to be managed. Every managed device keeps a database of values for each of the definitions written in the MIB. It is not the actual database itself—it is the metadata about the information contained within the agent. Definition of the MIB conforms to the SMI given in RFC 1155. The latest Internet MIB given in RFC 1213 is sometimes called the MIB-II.

- Section 3.1.1, “Viewing a List of MIB Modules,” on page 16
- Section 3.1.2, “Understanding the MIB Database,” on page 16
- Section 3.1.3, “Importing a MIB Database,” on page 17
- Section 3.1.4, “Browsing for a MIB,” on page 18
- Section 3.1.5, “Finding a MIB,” on page 18
- Section 3.1.6, “Removing a MIB from the Database,” on page 19

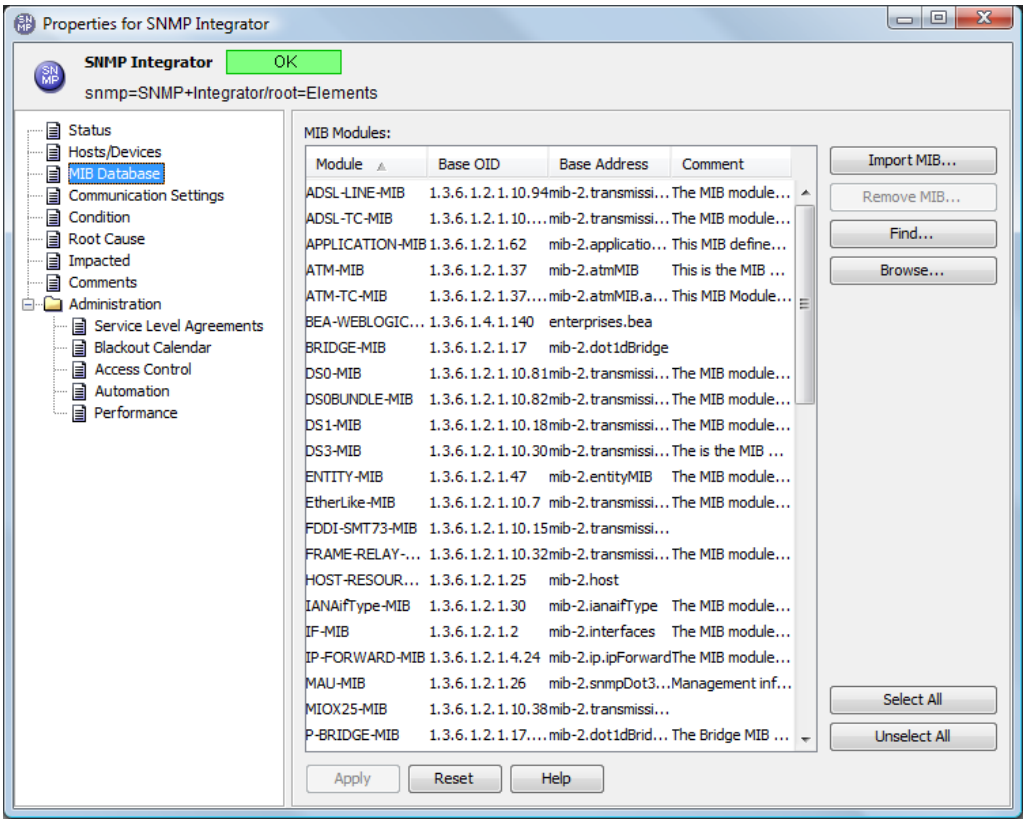
3.1.1 Viewing a List of MIB Modules

Operations Center supports both SMI version 1 and version 2, and ships with approximately 100 MIB databases, mostly comprised of those standardized MIBs defined by the IETF. When the SNMP adapter starts up, it automatically extracts the MIBs. View the list of databases on the *SNMP Integrator* adapter element's MIB Database property page, as shown above.

If it is necessary to import additional MIBs for your SNMP Agents, see Section 3.1.3, "Importing a MIB Database," on page 17the following section. Supported and imported MIBs are automatically added to the Model Repository and are available for selection when setting up hosts/devices.

Figure 3-1 shows a list of MIB modules used by the SNMP adapter MIB Database property page:

Figure 3-1 *SNMP Adapter Properties*



To access this view, right-click the top-level *SNMP Integrator* adapter element in the *Elements* hierarchy, then select *Properties*.

3.1.2 Understanding the MIB Database

The SNMP adapter allows you to import and use any MIB database that you have available. MIB databases can be obtained from the Internet or from device software that you might have.dsads

A free SNMP MIB search engine for SNMP MIBs is available at mibDepot. Use this search engine to build a comprehensive dictionary of detectable attributes. For example, Figure 3-2 displays the list of matching objects you get when you run a search for information on `compression` under `Microsoft`.

Figure 3-2 *OID lookup table from http://www.mibdepot.com*

Search Results: 8 entries found

#	VENDOR	TYPE	MIB Version	OID Name	OID	MIB Name	File Name
1	microsoft	TABULAR	v1	rasportPercentCompressionIn	.1.3.6.1.4.1.311.1.1.3.1.1.31.1.8	WINDOWS-NT-PERFORMANCE	winnt-perf.mib
2	microsoft	TABULAR	v1	rasportPercentCompressionOut	.1.3.6.1.4.1.311.1.1.3.1.1.31.1.7	WINDOWS-NT-PERFORMANCE	winnt-perf.mib
3	microsoft	TABULAR	v1	rasprtPercentCompressionIn	.1.3.6.1.4.1.311.1.1.3.1.1.18.1.7	WINDOWS-NT-PERFORMANCE	Microsoft-perfmon.mib
4	microsoft	TABULAR	v1	rasprtPercentCompressionOut	.1.3.6.1.4.1.311.1.1.3.1.1.18.1.6	WINDOWS-NT-PERFORMANCE	Microsoft-perfmon.mib
5	microsoft	SCALAR	v1	rastotalPercentCompressionIn	.1.3.6.1.4.1.311.1.1.3.1.1.16.6.0	WINDOWS-NT-PERFORMANCE	winnt-perf.mib
6	microsoft	SCALAR	v1	rastotalPercentCompressionOut	.1.3.6.1.4.1.311.1.1.3.1.1.16.5.0	WINDOWS-NT-PERFORMANCE	winnt-perf.mib
7	microsoft	SCALAR	v1	rastotPercentCompressionIn	.1.3.6.1.4.1.311.1.1.3.1.1.19.6.0	WINDOWS-NT-PERFORMANCE	Microsoft-perfmon.mib
8	microsoft	SCALAR	v1	rastotPercentCompressionOut	.1.3.6.1.4.1.311.1.1.3.1.1.19.5.0	WINDOWS-NT-PERFORMANCE	Microsoft-perfmon.mib

Then, clicking the *OID Name* link, `rasprtPercentCompressionOut`, the following screen displays details about the syntax and access:

Figure 3-3 *Details about the rasprtPercentCompressionOut OID*

Previous Tabular
Next Tabular

-- performance **MIB group (1.3.6.1.4.1.311.1.1.3.1.1)**
-- **iso(1). org(3). dod(6). internet(1). private(4). enterprises(1). microsoft(311). software(1). systems(1). os(3). winnt(1). performance(1)**

rasprtPercentCompressionOut OBJECT-TYPE

-- 1.3.6.1.4.1.311.1.1.3.1.1.18.1.6
-- iso(1). org(3). dod(6). internet(1). private(4). enterprises(1). microsoft(311). software(1). systems(1). os(3). winnt(1). performance(1). rasprtrAS-PortTable(18). rasprtrAS-PortEntry(1). rasprtPercentCompressionOut(6)

SYNTAX **INTEGER**
ACCESS **read-only**
DESCRIPTION
"The compression ratio for bytes being transmitted."

::= { **rasprtrAS-PortEntry 6** }

You can use this information to build a dictionary of detectable attributes at a very detailed level.

The following is a sample MIB based on `rasprtPercentCompressionOut`:

```
iso.org.dod.internet.private.enterprises.microsoft.software.systems.os.w
innt.performance.rasprtrAS-PortTable.rasprtrAS-PortEntry.rasprtPercentCo
mpressionOut: 1.3.6.1.4.1.311.1.1.3.1.1.18.1.6
```

3.1.3 Importing a MIB Database

To import a MIB Database

1. In the *Explorer* pane, expand *Elements*.
2. Right-click the SNMP adapter, and select *Properties*.
3. In the left pane, click *MIB Database*.
4. Click *Import MIB*.

5 Click *Look In* and select a MIB database file.

6 Click *Import*.

3.1.4 Browsing for a MIB

To find a MIB by browsing:

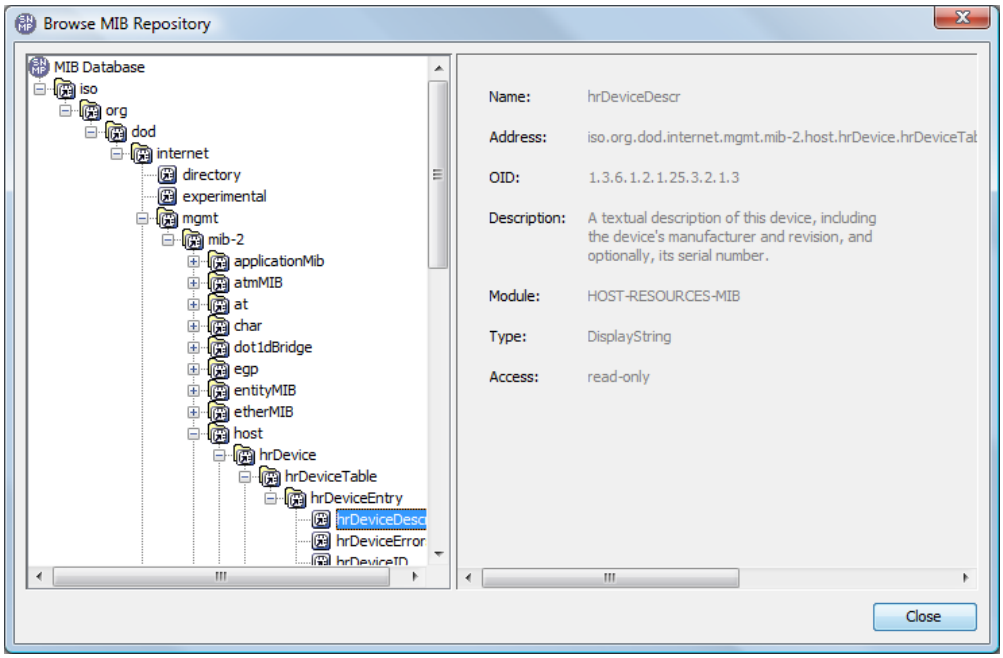
1 In the *Explorer* pane, expand *Elements*.

2 Right-click the SNMP adapter, and select *Properties*.

3 In the left pane, click *MIB Database*.

4 Click *Browse*.

The Choose MIB Branch dialog box opens to allow you to browse the MIB Database tree:



5 Select an item and view properties in the right display pane.

3.1.5 Finding a MIB

To search for a MIB:

1 In the *Explorer* pane, expand *Elements*.

2 Right-click the SNMP adapter, and select *Properties*.

3 In the left pane, click *MIB Database*.

4 Click *Find* to display the *Search* dialog box.

5 Do one of the following:

- Enter a keyword matching the host name.
- Use a Perl 5 regular expression to search for MIBs. The following example matches all hosts with netiq.com:

  ```
  .*netiq.com
  ```

Click *OK* to start the search. On completion of the search, the number of matching MIBs is confirmed and matches are highlighted in the MIB Database property page.

3.1.6 Removing a MIB from the Database

To remove a MIB from the database:

1 In the *Explorer* pane, expand *Elements*.

2 Right-click the SNMP adapter, and select *Properties*.

3 In the left pane, click *MIB Database*.

4 Select a module and click *Remove*.

3.2 Managing a Model Repository Structure

When you set up the SNMP adapter, it is necessary to create a model structure to organize data originating from the MIBs.

Three types of objects are available to create the structure for the Model Repository:

- **Containers:** Placeholder objects, similar to a folder, that can logically group other, "contained" objects.

  For more information, see Section 3.2.2, "Creating Repository Containers," on page 20.

- **Collectors:** Containers that can also have properties that point directly to specific MIB values within an agent. Collectors allow you to select managed objects from wherever they normally live in the Model Repository and collect them in one central place.

  For more information, see Section 3.2.3, "Creating Repository Collectors," on page 21.

- **Branches:** Allows selecting a MIB branch from an exact point downwards in the MIB metadata tree.

  For more information, see Section 3.2.4, "Creating Repository Branches," on page 25.

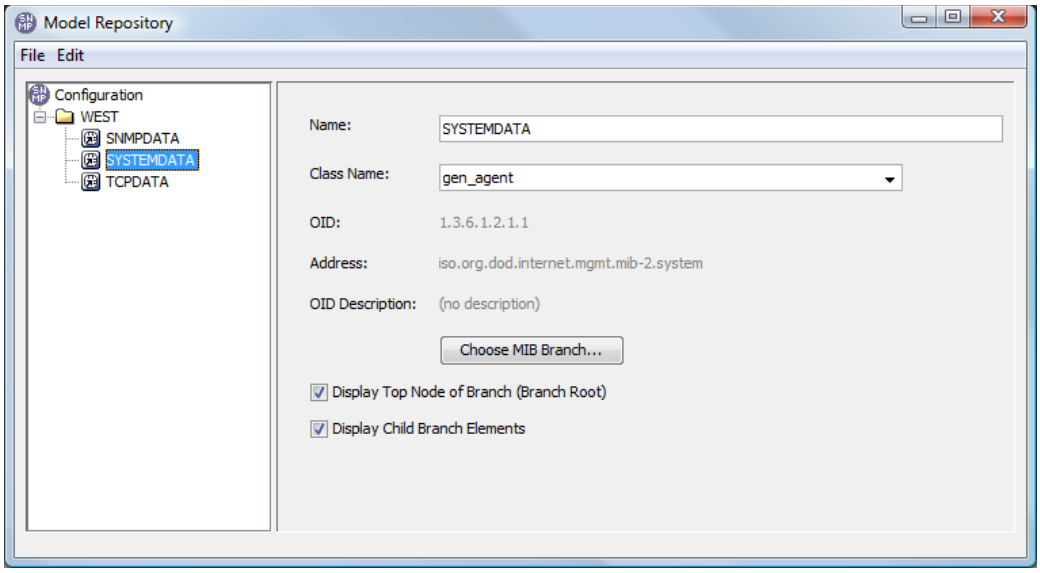
The following sections provide instructions on creating structure for the Model Repository:

- Section 3.2.1, "Browsing the Model Repository," on page 20
- Section 3.2.2, "Creating Repository Containers," on page 20
- Section 3.2.3, "Creating Repository Collectors," on page 21
- Section 3.2.4, "Creating Repository Branches," on page 25
- Section 3.2.5, "Removing Containers, Collectors, and Branches," on page 26

3.2.1 Browsing the Model Repository

To browse the model repository:

1. In the *Explorer* pane, expand the *Elements* root element.
2. Right-click the *SNMP Adapter* element, then select *Model Repository* to open the Browse Model Repository dialog box:



3. Double-click each item to browse its branch of the tree.

   Selecting an item shows basic information displayed in the pane to the right.

3.2.2 Creating Repository Containers

A container is simply a placeholder object that can be used to logically group other, "contained" objects. A container is analogous to a folder.

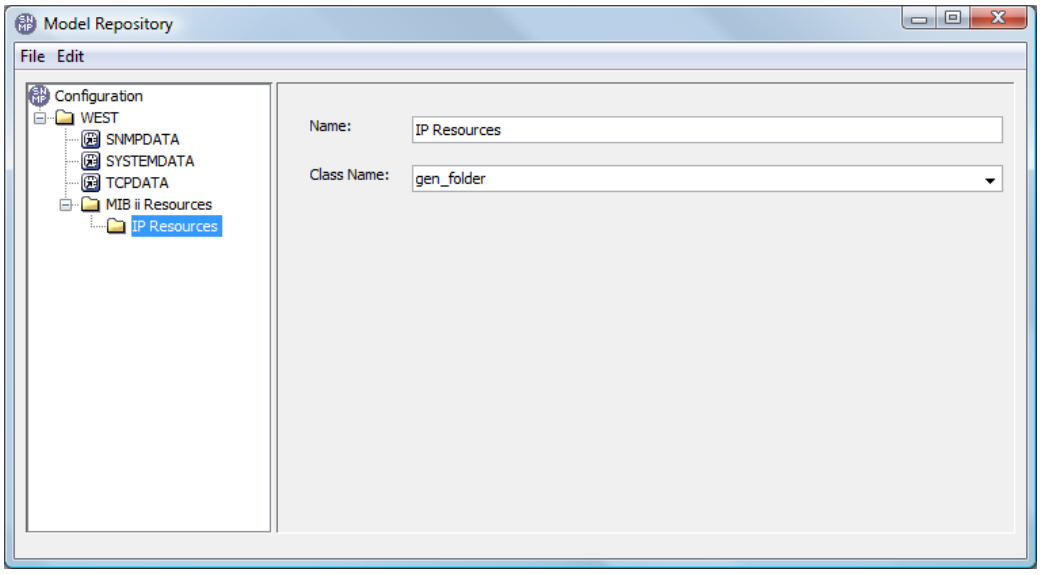
- "Adding Containers to the Model Repository" on page 21
- "Removing a Container from the Model Repository" on page 21

Adding Containers to the Model Repository

To add containers to the model repository:

1 In the Browse Model Repository dialog box, right-click an item, then select *Add* > *Container*.

A new container (folder) is added to the tree view:



2 Use the fields displayed in the right pane to update the name and class for the new container.

Removing a Container from the Model Repository

To remove a container from the model repository:

1 In the Browse Model Repository dialog box, right-click a container, then select *Remove*.

The container is removed from the tree.

3.2.3 Creating Repository Collectors

Collectors allow you to select managed objects from various locations and collect them in a central place. A collector is a container that also is made up of properties, which point directly to specific MIB values within an agent. These properties can have user-defined thresholds assigned to them, which is a way to model state within the adapter.

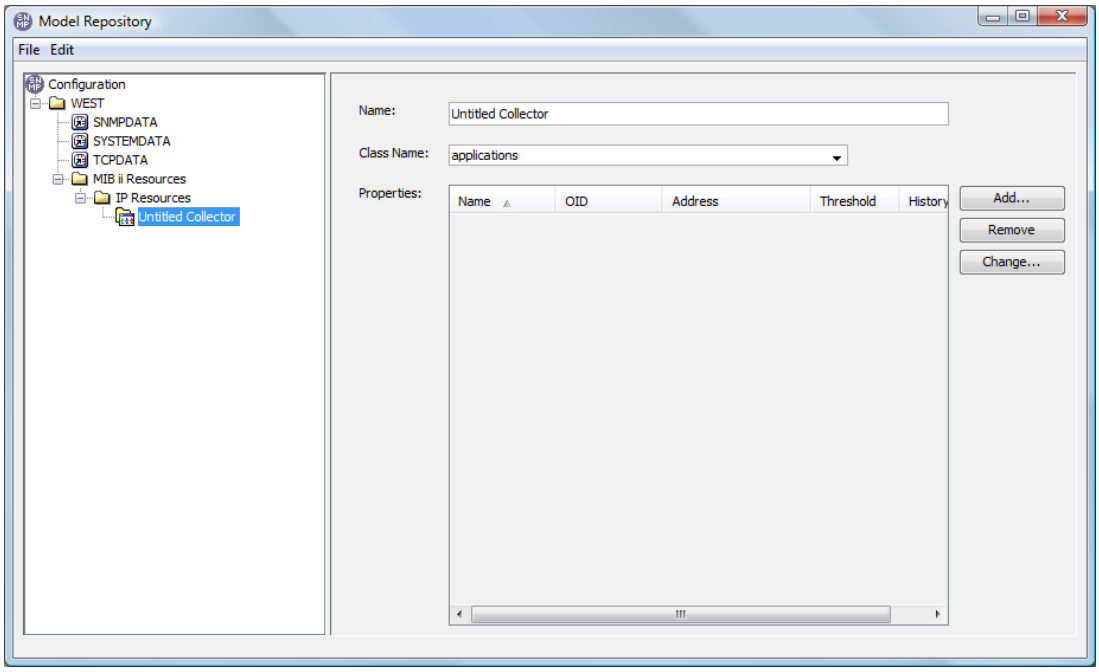
- "Adding Collectors to the Model Repository" on page 21
- "Adding Properties to a Collector" on page 23
- "Editing Collector Properties" on page 24

Adding Collectors to the Model Repository

To add collectors to the model repository:

1 In the Browse Model Repository dialog box, right-click an item, then select *Add* > *Collector*.

A new collector is added to the tree view.



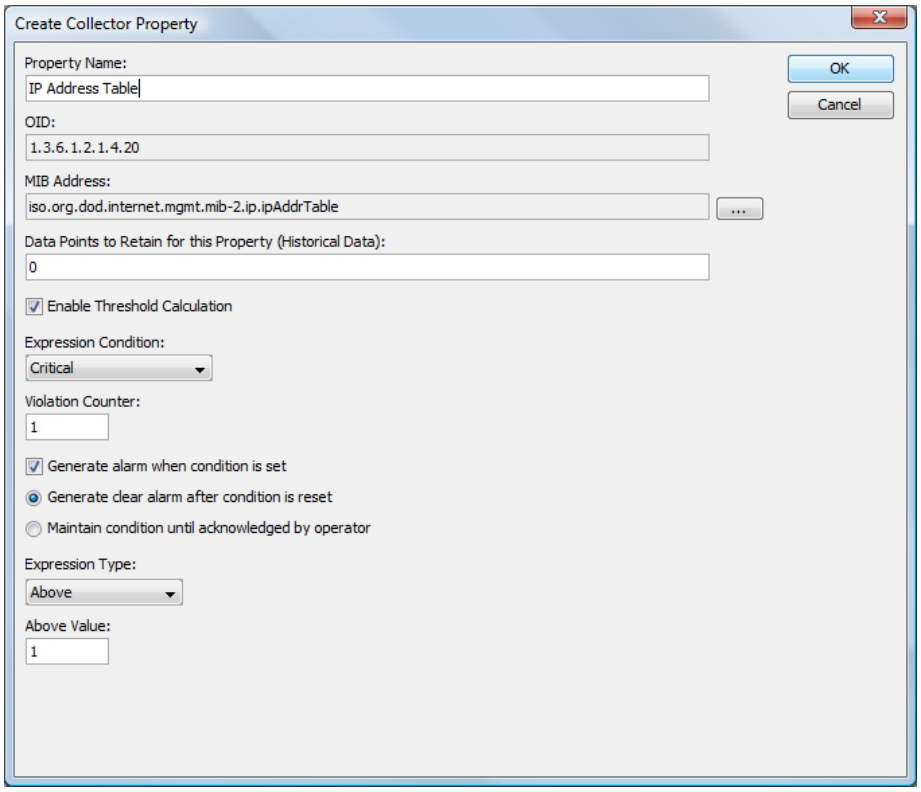
2 Specify the name and class for the collector.

3 Continue to "Adding Properties to a Collector" on page 23.

Adding Properties to a Collector

To add properties to a collector:

1. In the Browse Model Repository dialog box, browse, then select the collector item.
2. Click *Add* to open the Create Collector Property dialog box:



3. Specify a name for the property.
4. Under *MIB Address*, click ... (*Ellipse*) to browse, then select the appropriate MIB node.

   Making a selection fills in the *OID* and *MIB Address* fields.
5. (Optional) Specify *Data Points to Retain* for this property (Historical Data).
6. (Optional) Select the *Enable Threshold Calculation* check box to specify conditions for generating alarms.

   Then, specify the condition threshold values:

   6a From the *Expression Condition* drop-down list, select the element condition that triggers the element condition change alarm.

   This is used in conjunction with the *Violation Counter* value.

   6b In the *Violation Counter* field, specify the number of times the threshold can be reached before the element condition change is issued.

   For example, if the *Expression Condition* is `Critical` and the *Violation Counter* is 2, an element condition change is issued after an element reaches the `Critical` condition twice.
7. Select the *Generate Alarm when Condition Is Set* check box to issue an alarm when the threshold is violated using the *Violation Counter* and *Expression Condition* values.

   If deselected, no alarm is issued.

Then, select one of the following options to determine which action is performed after an alarm is issued:

- **Generate clear alarm after condition is reset:** Clears the alarm when the element's condition is reset.
- **Maintain condition until acknowledged by operator:** Locks the element's condition until it is manually released when the alarm is acknowledged.

8 Define the violation trigger threshold using an *Expression Type* and corresponding *Value* settings together to define the violation trigger threshold:

Expression Type	Evaluates Expressions…
Above	Above the specified value.
Below Value	Below the specified value.
Between	Containing values between the specified minimum and maximum.
String	Whose results match the specified string.
	Define the string value using equals, contains, starts with, ends with, or matches (regex) operators.
	Select the *Invert result value (Boolean "not")* check box to evaluate the inverse of the string specified.

For example, select *Above* as the Expression Type to monitor values that exceed the number specified in the Expression's *Above Value* field.

9 When the definition is complete, click *OK* to save the collector property.

Editing Collector Properties

To update collector properties:

1 Select the property item in the Collector Property list.

2 Click *Change* to open the Edit Collector Property dialog box.

3 Update the information, then click *OK*.

3.2.4 Creating Repository Branches

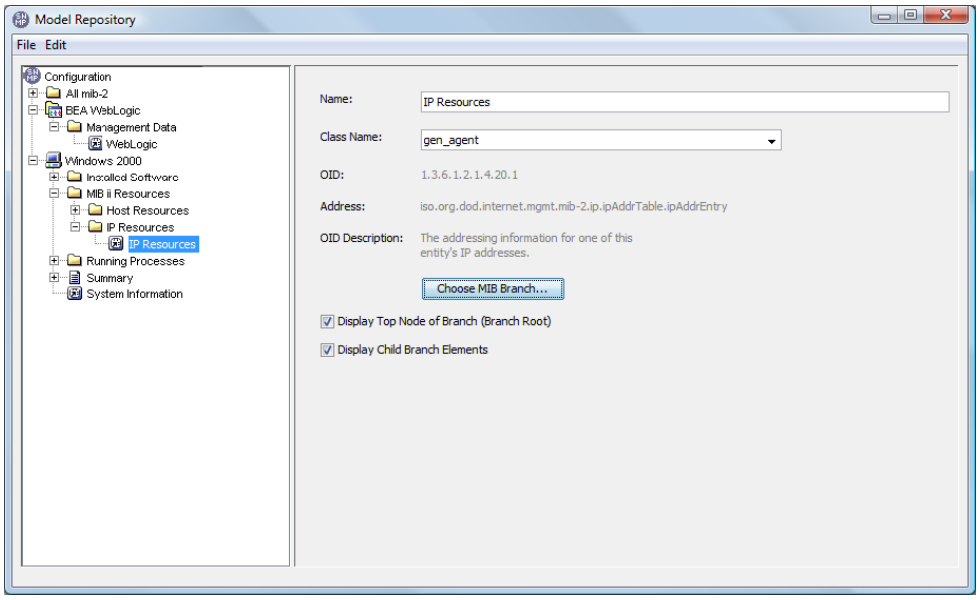
Branches are extracted from the MIB metadata tree. A branch is a convenient monitoring point that allows a whole class of information to be duplicated within Operations Center from the target host/device.

Keep in mind when creating a branch object, that potentially a large amount of data must be collected to build the branch hierarchy; using a small subset of a MIB branch is likely the best approach to collecting this data.

To add branches to the Model Repository:

1. In the *Browse Model Repository* dialog box, right-click a folder or container, then select *Add* > *Branch*.

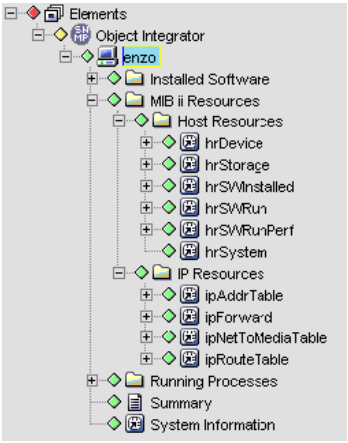
   A new branch is added to the tree view:



2. Use the properties displayed in the right pane to update the name and class for the new branch.
3. Click *Choose MIB Branch* to browse, then select the appropriate MIB branch.
4. Select the *Display Top Node of Branch (Branch Root)* check box to display the top object of the *MIB* branch as a *Operations Center* child element.
5. Select the *Display Child Branch Elements* check box to show all child elements of the selected *MIB* branch in the *Operations Center* hierachy tree.

In the figure in Step 1 on page 25, child branches for the IP Resources branch are selected for display. Therefore, any host or device element set up in Operations Center with Windows 2000 as a selected model automatically has the *MIB* child elements under the *IP Resources* element, as shown in Figure 3-4. Notice how the entire structure under the *Enzo* element corresponds to the Windows 2000 structure, as set up in the Model Repository.

Figure 3-4 *Selected branches defined in the Model Repository display under the enzo element in the Operations Center console*



3.2.5 Removing Containers, Collectors, and Branches

Any of the model objects can be easily deleted from the Model Repository.

To remove a model object from the Model Repository:

1 In the Browse Model Repository dialog box, right-click the item, then select *Remove*.

The container, collector, or branch is removed from the tree.

4 SNMP Hosts and Devices

All SNMP agents that you wish to monitor must be configured as hosts/devices in Operations Center. This section explains adding and managing hosts and devices.

- Section 4.1, “Adding Hosts/Devices,” on page 27
- Section 4.2, “Managing Hosts/Devices,” on page 31
- Section 4.3, “Finding a Host,” on page 31
- Section 4.4, “Removing Hosts,” on page 31
- Section 4.5, “Changing the Host/Device Community,” on page 32
- Section 4.6, “Polling a Host/Device,” on page 33

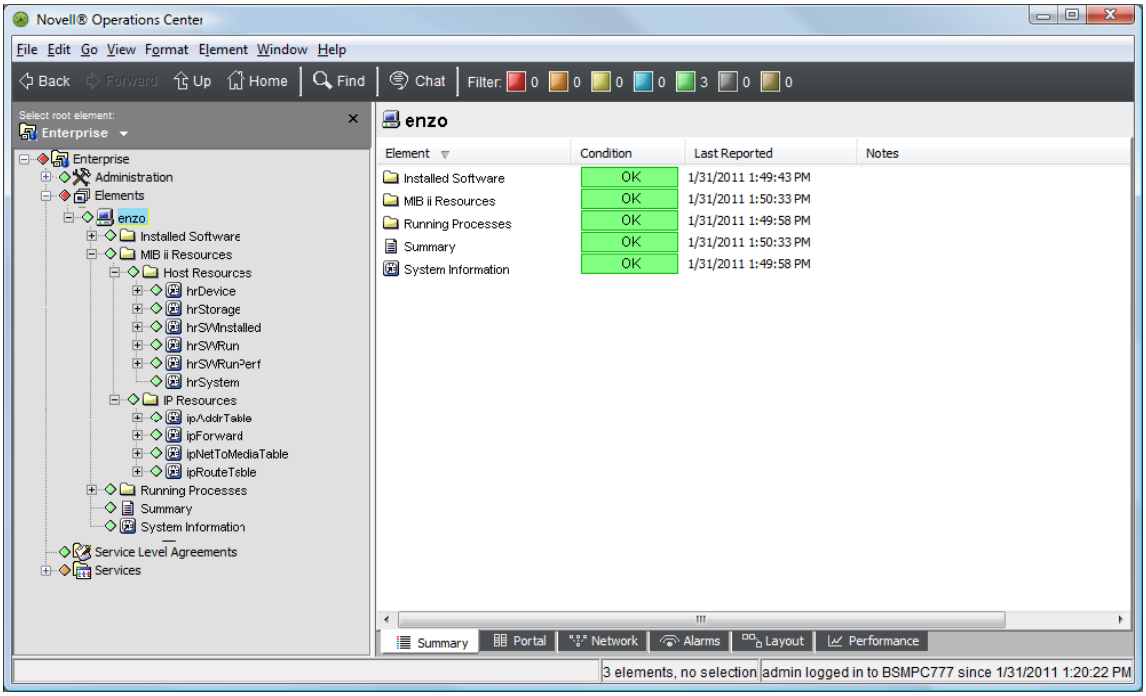
4.1 Adding Hosts/Devices

SNMP agents that are monitored must be configured in Operations Center using options available on the element’s right-click menu or in the element’s property pages.

For each SNMP agent that you set up for your SNMP adapter, you must specify which model(s) it belongs to. The model has the MIBs required for the adapter to talk to and gather information from the host or device.

Figure 4-1 shows a host that belongs to the Windows 2000 container in the Model Repository. This host gathers information and log events based on the available MIBs and threshold calculations (specified in collectors), as defined for the Windows 2000 model.

Figure 4-1 *Operations Center console: All hosts and devices are displayed as elements in the Operations Center Explorer pane*



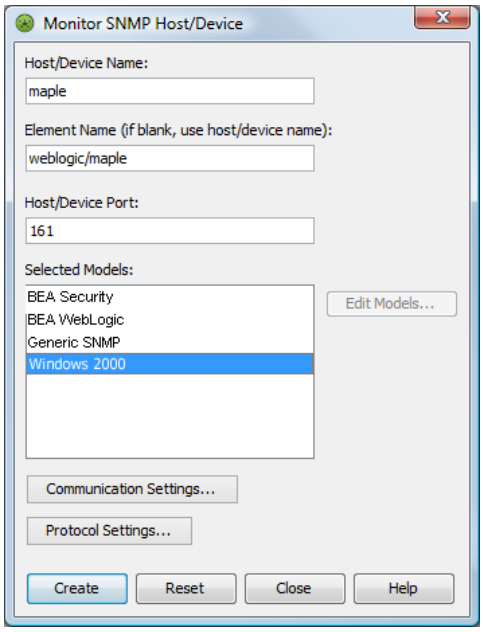
There are two ways to add hosts or devices:

- Section 4.1.1, “Adding a Host or Device Manually,” on page 29
- Section 4.1.2, “Discovering Hosts/Devices,” on page 30

4.1.1 Adding a Host or Device Manually

To add a host or device:

1. In the *Explorer* pane, expand the *Elements* root element.
2. Right-click the top-level *SNMP Integrator* adapter element, then select *Monitor SNMP/Device* to open the Monitor SNMP Host/Device dialog box:



3. Specify the appropriate information:

   Host/Device Name: The host name of the machine to monitor.

   Element Name: The display name used for the host. If this field is blank, the `Host/Device Name` is used.

   Host/Device Port: The port used to communicate with the host or device.

   Selected Models: Lists all available model definitions that describe the data monitored from this SNMP host or device. Select one or more models.

   Communication Settings: These are set globally using the top-level object. To use custom settings for a particular host, click *Communication Settings*, then see Section 5.2, "Overriding Global Communication Settings," on page 36.

   Protocol Settings: These are set globally using the top-level object. To use custom settings for a particular host, click *Protocol Settings*, then see Section 5.3, "Overriding Global Protocol Settings," on page 36.

4. Click *Create*.

   The new host displays beneath the *SNMP Integrator* adapter element.

4.1.2 Discovering Hosts/Devices

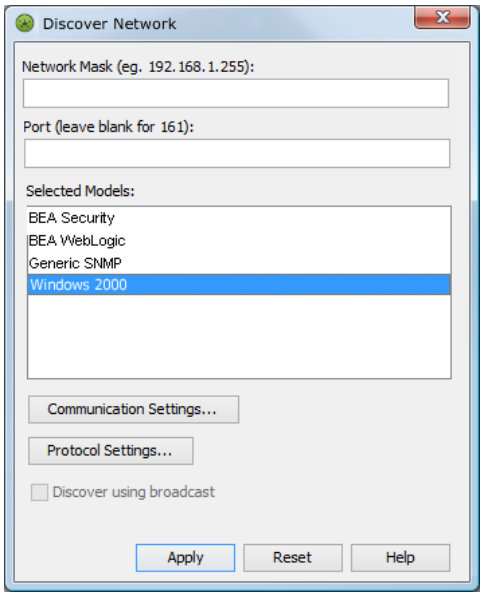
Performing a discovery is a fast way to find and add SNMP capable hosts on the network that meet the given criteria.

When using the network discovery feature, please note:

- The network must allow UDP broadcasts.
- The discovery is performed across one subnet only.
- Discovery can be performed on the same subnet as the Operations Center server.

To perform a network discovery to add hosts:

1. In the *Explorer* pane, expand the *Elements* root element.
2. Right-click the top-level *SNMP Integrator* adapter element, then select *Discover Network*.



3. *(Optional)* Type the network IP address in the *Network Mask* field.

   Leave this field blank to discover on the network local to the Operations Center server.
4. *(Optional)* Type the port number in the *Port* field.

   Leave this field blank to use the default port of 161.
5. Select one or more models in *Selected Models*.

   For more information about setting up your model repository, see Section 3.2, “Managing a Model Repository Structure,” on page 19.
6. To use custom communication settings for the discovery.

   For information on communication settings, see Section 5.2, “Overriding Global Communication Settings,” on page 36.
7. To use custom protocol settings for the discovery, click *Protocol Settings*.

   For information on protocol settings, see Section 5.3, “Overriding Global Protocol Settings,” on page 36.
8. *(Optional)* If using SNMP v1 or v2c, deselect the *Discover using broadcast* option to perform a more complete search for hosts and devices. Instead of using a broadcast, the discovery attempts to contact each IP Address individually.

9 Click *Apply* to start the discovery.

Discovered hosts and devices display as elements under the SNMP Integrator adapter element.

10 To track the discovery process, monitor the `/OperationsCenter_install_path/logs/formula.trc` file. If the following Warning message occurs, discovery has found an agent but was unable to establish communications (e.g., login information is incorrect):

```
WARN Integration.SNMP.Adapter: SNMP_Integrator_Adapter_Name - Discovery
received a REPORT for address IP_Address
```

For information about log files, see "Understanding Trace Logs and Content" in the *Operations Center 5.5 Server Configuration Guide*

4.2 Managing Hosts/Devices

SNMP Hosts can be managed or unmanaged using options on the host element's right-click menu.

To manage or unmanage a host:

1 In the *Explorer* pane, expand the *Elements* root element > *SNMP Integrator* > the top-level SNMP object.

2 Do either of the following:

- To start monitoring a host, right-click a host, then select *Manage* > *Start*.
- To stop monitoring a host, right-click a host, then select *Manage* > *Stop*.

4.3 Finding a Host

To locate a particular SNMP host in the Hosts property dialog box:

1 In the *Explorer* pane, expand the *Elements* root element.

2 Right-click the *SNMP Integrator* element, then select *Properties* to open the Status property page.

3 In the left pane, click *Hosts/Devices* to open the Hosts/Devices property page.

4 Click *Find* to open the Find dialog box.

5 Specify a keyword matching the host name, then click *OK*.

The search takes place. A dialog box confirms the number of matching hosts and highlights them in the Hosts/Devices property page.

6 Click *OK* to close the dialog box.

TIP: You can also use a Perl 5 regular expression to search for hosts. The following example matches all hosts with Acme.com:

.*Acme.com

4.4 Removing Hosts

SNMP hosts can be removed using the individual host element menu or using the Hosts property dialog box:

- Section 4.4.1, "Removing a Host," on page 32
- Section 4.4.2, "Removing Multiple Hosts," on page 32

4.4.1 Removing a Host

To remove a host using the element menu:

1. In the *Explorer* pane, expand the *Elements* root element > *SNMP Integrator*.
2. Right-click a host, then select *Remove Host/Device*.

4.4.2 Removing Multiple Hosts

To remove multiple hosts using the top-level object's host Properties dialog box:

1. In the *Explorer* pane, expand the *Elements* root element.
2. Right-click the top-level *SNMP Adapter* element, then select *Properties* to open the Status property page.
3. In the left pane, click *Hosts/Devices* to open the Hosts/Devices property page.
4. Select one or more hosts, then click *Remove Host/Device*.

4.5 Changing the Host/Device Community

With SNMP, communities are used to establish trust and security between managers and agents. Each agent is configured with three community names: read-only, read-write, and trap. The community names are the passwords that you use to access your account and that represent primary types of activity:

- **read-only:** This community string only allows data values to be read. There is no modification of any kind. This is the only community string used by the SNMP Integrator adapter.
- **read-write:** This community string allows both the reading and writing of data values. This means that values can be reset, interfaces can be reset, and changes can be made to a device's configuration.
- **trap:** This community string allows you to receive asynchronous notifications from an agent.

To change the community for a host or device:

1. In the *Explorer* pane, expand the *Elements* root element.
2. Right-click the top-level *SNMP Adapter* element, then select *Properties* to open the Status property page.
3. In the left pane, click *Hosts/Devices* to open the Hosts/Devices property page.
4. Select the host, then click *Change Community*.
5. Specify your password in the prompt dialog box.

4.6 Polling a Host/Device

To enable or disable polling:

1. In the *Explorer* pane, expand the *Elements* root element > *SNMP Integrator.*
2. Right-click a top-level host element, then do any of the following:
   - To enable polling, select *Manage* > *Enable Polling*.
   - To disable polling, select *Manage* > *Disable Polling*.
   - To enact an immediate poll, select *Manage* > *Poll Now*.

5 Communication & Protocol Settings

Communication settings establish the basic connection properties between Operations Center and any SNMP agent. They also enable the dynamic loading of applications that are not static.

Protocol settings include the version of SNMP and password to establish communications with a host or device.

TIP: To identify static applications, run the `PSL %DUMP KM_LIST` command, which lists Yes or No in the fourth column.

Review the following sections to set up and manage global communication settings:

- Section 5.1, "Configuring Global Communication & Protocol Settings," on page 35
- Section 5.2, "Overriding Global Communication Settings," on page 36
- Section 5.3, "Overriding Global Protocol Settings," on page 36

5.1 Configuring Global Communication & Protocol Settings

Communication and protocol settings can be set at the global level for all hosts using the top-level object.

To configure communication and protocol settings globally:

1. In the *Explorer* pane, expand the *Elements* root element.
2. Right-click the top-level *SNMP Integrator* adapter element, then select *Properties* to open the Status property page.
3. Do the following to define communication settings:
   - **3a** In the left pane click *Communication Settings*.

     The settings on the Communications Settings property page are used globally.
   - **3b** Use the spinners to specify values.

     The following settings monitor the downstream connection between the agent and the client (which is the integration):

     - **Poll Interval:** The amount of time between heartbeat packets to indicate the client is still talking to agent.
     - **Poll Retry Interval:** The number seconds between of retry attempts.
     - **Poll Timeout:** The number of seconds to wait to establish a connection to the agent.
     - **Poll Timeout Retries:** The maximum number of retry attempts.
     - **Maximum Active Polls:** The maximum number of times that polling requests are sent.
   - **3c** Select the *Generate alarms for polling activity* option to issue alarms corresponding to each poll for data.

3d Leave the *Enable debug tracing* check box deselected.

If you select this check box, a large amount of data is logged in the `formula.trc` file. Only select this check box when asked by Technical Support for troubleshooting purposes.

3e Click *Apply*.

4 Do the following to define protocol settings:

4a In the left pane click *Protocol Settings*.

The settings on the Protocol Settings property page are used globally.

4b Specify SNMP Protocol Version and community string.

4c Click *Apply*.

5.2 Overriding Global Communication Settings

To override the global communication settings for a particular host, you can establish custom settings:

1. In the *Explorer* pane, expand the *Elements* root element > the top-level *SNMP Integrator* adapter element.
2. Right-click a host, then select *Properties* to open the Status property page.
3. In the left pane, click *Host/Device* to open the Host/Device property page.
4. Click *Communication Settings*.
5. Select the *Use custom settings for this host/device* check box.
6. Specify the poll and integration settings for the host.

   For information on specific settings, see Section 5.1, "Configuring Global Communication & Protocol Settings," on page 35.
7. Click *Apply* to save changes.

5.3 Overriding Global Protocol Settings

To override the global communication settings for a particular host, you can establish custom settings:

1. In the *Explorer* pane, expand the *Elements* root element > the top-level *SNMP Integrator* adapter element.
2. Right-click a host, then select *Properties*.
3. In the left pane, click *Host/Device* to open the Host/Device property page.
4. Click *Protocol Settings*.
5. Select the *Use custom settings for this host device* check box.
6. Specify the SNMP version, community string for the host, authentication and privacy protocols and passphrases.
7. Click *Apply* to save changes.