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# Insight Manager 7 SNMP Extensions utility

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## **abstract**

Insight Manager 7 is a systems management application that lets you monitor the status of a device, its component objects, and their attributes. Insight Manager 7 reports on the device status, creates event and trap reports on device conditions, and performs a specific set of actions on managed devices.

Insight Manager 7 includes SNMP Extensions Toolkit, a group of components that allows you to manipulate your management environment. You can use SNMP Extensions from the graphical user interface of Insight Manager 7 or from the command line.

SNMP Extensions consists of the following components.

- SNMP MIB Registration
- SNMP MIB Upload
- MIB Check
- Trap Editor
- Trap Categories Editor
- Command Line Utility

## **take control of the management environment**

Over time, the typical network changes in topology, function, and content. As an administrator, you are challenged to manage devices that are not fully recognized by your management application. How can you address the problem of classifying the devices? SNMP Extensions can help you by providing ways to add input to your network management.

## **management basics**

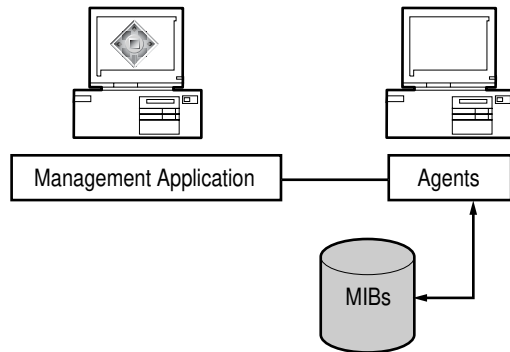
To use SNMP Extensions successfully, you should be familiar with the following terms and concepts.

*Management*—Management is the process of acquiring information about devices on a network or enterprise. Management is performed when an application, such as Insight Manager 7, requests data or accepts traps (a type of message) from devices on a network. The management application communicates the request and receives responses to the request using a protocol like SNMP (Simple Network Management Protocol) for communication.

*SNMP*—SNMP is the most commonly used protocol for exchanging management information between devices. SNMP retrieves data from a target device. The data is accessed through an SNMP agent, a program that interrogates the device and returns the response to the management application. In order for the devices to be monitored (read) or controlled (written to) by a management application, an agent must reside on the device or interact with the device. The data about the device is found in a MIB (Management Information Base).

*MIB*—A MIB is a repository of information. A MIB describes manageable objects or devices. (An SNMP manageable object and an Insight Manager 7 device are generally equivalent. Either term refers to SNMP-manageable entities).

The MIB is a virtual mapping of variables to physical hardware and its related devices. SNMP abstracts the control of the device through these variables. The below figure illustrates the interaction of the management application, the agents on a device, and the MIB databases. The configuration in this diagram shows two MIB databases. Multiple MIB databases within the same configuration should have the same versions of a MIB. MIB databases must be synchronized so interpretations of data are uniform.



The MIB is analogous to a database schema because it represents data and data structures. MIBs have been defined for TCP/IP routers and hosts, interface types, such as token ring and FDDI, and devices, such as servers and bridges. HP has defined MIBs for all of its SNMP-capable devices. These MIBs are pre-compiled into the database and can be used by Insight Manager 7.

Other third-party devices like routers and hubs exist on a network. Vendors of these network devices also define MIBs. When the vendor MIB is registered into the database, you can use Insight Manager 7 to monitor and control the devices.

The MIB structure is explained in the IETF (Internet Engineering Task Force) Standards RFC 1155. Because the MIB structure resembles the directory and subdirectory file structure used for an operating system, it is often referred to as a tree with a root.

MIB files often contain groups of variables that define the types of information that can be retrieved from a device. MIB information and characteristics include an object identifier, or OID, and a unique identifier that identifies the MIB and the variable. A variable can have one or more values. The OID is in numeric dot format. The tree structure determines the unique name and OID notation for each manageable entity.

MIB variables declare certain characteristics of the device, such as the operating system. HP MIBs include information like version numbers and product names. For example, the following table shows variables for an HP server running Windows NT 4.0. The values for the variables include the product and other information derived from the MIB database.

<b>variable name and description</b>	<b>OID</b>	<b>data type</b>	<b>value</b>
<p>Syslocation</p> <p>The physical location of this node. (For example, the telephone closet, 3<sup>rd</sup> floor).</p>	1.3.6.1.2.1.1.6	ASCII String	MRO1-2/KL24
<p>SysDescr</p> <p>A textual description of the entity. This value should include the full name and version identification of the system's hardware type, software operating system, and networking software. It is mandatory that this only contain printable ASCII characters.</p>	1.3.6.1.2.1.1.1	ASCII String	Hardware: x86 Family 6 Model 3 Stepping 4 AT/AT COMPATIBLE- Software: Windows NT Version 4.0 (Build Number: 1381 Uniprocessor Free)
<p>SysObjectID</p> <p>The vendor's authoritative identification of the network management subsystem contained in the entity.</p> <p>This value is allocated within the SMI enterprise subtree (1.3.6.1.4.1) and provides an easy and unambiguous means for determining what kind of box is being managed.</p> <p>For Example, if vendor Flintstones, Inc. was assigned the subtree 1.3.6.1.4.1.4242, it could assign the identifier 1.3.6.1.4.1.4242.1.1 to its Fred Router.</p>	1.3.6.1.2.1.1.2	Object Identifier	1.3.6.1.4.1.311.1.1.3.1.1

information retrieved from MIBS MIBs often organize their information by object groups that contain a related collection of variables. MIB variables contain attributes that include:

- The data type
- A textual description
- The read or write access
- Whether the variable is mandatory or optional

MIBs contain the traps that the device can generate. Traps are messages the device sends when specific conditions occur. Traps can include:

- The trap object identifier (trap OID)
- The agent IP address

A trap can be interpreted and formatted for display.

MIBs can contain one or more MIB variable bindings. Bindings convey useful information associated with the condition that triggered the trap. Bindings include the Description, the Type, the Category, and the Severity. For example, the trap *cpqclusterFailed* has the following bindings:

<b>binding</b>	<b>content</b>
Description	This trap will be sent any time the condition of the cluster becomes failed
Type	Cluster Failed
Category	Cluster
Severity	Major

SNMP operations by agent

The agent performs the following SNMP operations:

GET and GET NEXT—Retrieve information about the managed device and return the information to the management application. In Insight Manager 7, the terms Monitor and Read are equivalent to a GET.

SET—Changes the value of a managed device variable in the MIB database. Only variables whose device definitions have read and write access can be set. In Insight Manager 7, the terms Control and Write are equivalent to a SET.

TRAP—Sends messages to the management application when a change or error occurs in a managed object. The trap is the only operation initiated by the agent without a specific request from the management program. The MIB defines the syntax of any trap messages initiated by the agent. Systems must be configured to receive traps.

In order to send and receive traps, the managed object and the management application must be configured correctly:

- The managed object must have a trap destination to direct traps to the server running the management application.
- The management server must be configured to receive the traps.
- The correct SNMP security needs to be established between the managed device and the management server using SNMP community strings, a type of authentication. If the community strings do not match, communication between the devices does not occur.
- The management application must understand the format of the trap.

how can SNMP Extensions help?

SNMP Extensions can help because it enables you to extend the SNMP V1.0 Management Information Base (MIB) of Insight Manager 7. SNMP Extensions lets you fully explore most devices on your network, broaden the scope of your network management, and prepare you to manage the network of the future.

*Exploring your network*—You can achieve greater understanding of your network because you can interrogate most MIB variables that have been incorporated into SNMP-compliant devices. Better understanding of the variables makes it easier to create Insight Manager 7 tasks that are based on SNMP events.

*Broadening your management scope*—Most likely, your network includes third-party devices. Insight Manager 7 ships with a variety of third-party MIBs, not all Third-party MIBs are registered by default. Using SNMP Extension, you can register the third-party MIBs.

Registration of third-party MIBs improves manageability in several ways:

- Registration enables the discovery process of third-party devices
- Registration adds event recognition
- Registration enhances event display

New versions of MIBs are available periodically. SNMP Extensions allows you to update your MIB database to the latest MIB revisions so you can discover and identify new devices using the latest information about the devices.

SNMP Extensions adds to event recognition by allowing you to optimize the event data to individual network requirements. For Example, you can include references to maintenance procedures. SNMP Extensions also permits you to construct your own interpretation of device events through the use of Trap Categories. You can organize your device maintenance by creating logical event categories. Then, exercise your judgment in assigning events to them. Furthermore, you can use the event categories to query for events according to a category of traps.

*Preparing your network for the future*—As time goes by, new network devices will be developed that you wish to add to your network. You can add the new devices, discover, and identify them if you have an associated MIB to register.

In addition to external MIB sources for third-party devices, you can continue to register new releases of HP MIBs that are distributed between releases of Insight Manager 7. New MIBs are distributed periodically on Management CDs. For the latest versions of HP MIBs, visit the website

<http://www.hp.com/>

## SNMP Extensions features

SNMP Extensions contains a graphical user interface to a MIB compiler that is a part of Insight Manager 7. It also has a command line utility that you use from a DOS command box. The command line utility performs a superset of the functions you can perform through the graphical interface.

**IMPORTANT:** Simultaneous use of both tools can have adverse affects on SNMP Explorer, Automatic Discovery, device identification, and event viewing.

SNMP Extensions contains the following functions:

**MIB Registration**—MIB Registration compiles new MIBs into the Insight Manager 7 database. MIB Registration also includes the Unregister function. Unregister removes the information about a registered MIB from the database. You might unregister a MIB before installing a new version of the MIB or when the device associated with the MIB is removed from the network. You can use MIB Register and MIB Unregister from either the Insight Manager 7 graphical user interface or from the command utility.

**MIB Trap Edit**—Trap Edit lets you customize the MIB information by modifying the text that describes traps. For example, replace cryptic default text with an easily understood message. You might include instructions, such as `Refer to our website http://... for faster problem resolution`. You can edit traps from either the Insight Manager 7 graphical user interface or from the command utility.

**MIB Upload**—Enables you to copy a MIB from your browser system to Insight Manager 7 server and directory.

**Trap Categories**—Enables you to use default trap categories or create you own logical groups for trap assignments. The same trap categories are available when you create a query. Using your own category, you can monitor your choice of devices for specific traps. Trap Categories is not a command line option

**SNMP Explorer**—Displays a selected, registered MIB and its variables on discovered devices. Simply examining a MIB and its variables and descriptions enhances your understanding of the MIB and how it works with the device. You might choose to modify the description or other modifiable attributes of the variable. You can open SNMP Explorer from a Device Link from the **Device** page of SNMP-compliant devices. SNMP Explorer is not a command line option.

## setting up the environment

The SNMP Extensions toolkit is intended for system administrators and network managers, who are familiar with SNMP management, network fundamentals, and their operating system environment. Refer to the specific documentation for your network and operating systems. SNMP Extensions Toolkit requires the same hardware and software requirements of Insight Manager 7. Consult the *Insight Manager 7 Technical Reference Guide* on the Management CD for details.

The SNMP Extensions Toolkit is intended for administrators and network managers who also have administrator privileges in Insight Manager 7. SNMP Extensions requires administrator privileges because core server SNMP definitions of Insight Manager 7 might be modified.

### **the set of installed MIBs**

Insight Manager 7 provides a set of MIBs that are already registered into the database. The default location for registered and non-registered MIBs is the following directory unless you have specified another at installation:

`\Program Files\HP\ Insight Manager 7\compaq\protocol\snmp\Mibs`

When you supplement the MIB set with new or revised MIBs, always copy them to this directory. The MIB Upload feature always installs the MIBs into the correct location. The registered MIBs and related files include:

- IETF Standard RFC 1213 Host Resources MIB and IETF Standard 1155 Structure of Management Information
- A set of HP MIBs, which are identified by the prefix CPQ, such as CPQCLUS. MIB, the HP cluster MIB or CPQIDE.MIB, the MIB for IDE drives.
- Third-party MIBs, such as the PATROL.MIB.

### **protecting source MIBs**

An excellent practice in MIB management is to never modify the MIB. Therefore, SNMP Extensions was designed to enable changes to trap declarations and other trap information without modifying the source MIBs. SNMP Extensions creates an editable file called the editfile. The editfile is a textual revision file identified by the file extension of REV. The editfile is applied after the MIB is compiled

Because the changes are not made to the MIB, you can reinstall MIBs and replace the changes if the database is corrupted or deleted. Therefore, keep backup copies of the REV editfiles. You can find the REV files in the same directory as the set of installed MIBs.

`\Program Files\HP\Insight Manager 7\compaq\protocol\snmp\Mibs`

### **managing MIBs from Insight Manager 7**

You can perform the most commonly used functions of SNMP from Insight Manager 7. These include:

- Registration of new HP and third-party MIBs
- Modification of registered MIBs and related browsing of all MIB variables
- Deletion of obsolete or unused MIBs
- Uploading new MIBs to be registered
- Use of trap categories for organization and event queries



**starting SNMP Extensions**

1. Browse to Insight Manager 7 on the server system using the URL for the server. For example:

[http://server\\_name:280/](http://server_name:280/)

2. After the **Device Overview** page is displayed, click the **Tools** tab.



3. Select **SNMP Extensions** and click **MIB Registration**. The **MIB Registration** page is displayed.
4. Examine the elements on the page. You will see the lists of registered and unregistered MIBs and the options you have for working with them.

**registering a MIB**

Registration of a MIB compiles the information into the Insight Manager 7 database. MIBs require a short interval to become fully registered. The more information, such as the number of traps, the longer the registration takes.

When you register, you can create a logfile and an editfile for a MIB.

**Logfiles**—A logfile is a record of the MIB registration. A logfile is created in the subdirectory Program Files\HP\HP Insight Manager 7.07\log. It has the registered name of the MIB with the suffix of TXT. For example, the CPQClus.MIB log file is CPQCLUS.TXT. You can find the logfiles in the default directory:

```
\Program Files\HP\Insight Manager 7\log
```

**Editfiles**—An editfile, known as the REV file, is the mechanism that enables you to introduce edited MIB information into the database without modifying the source MIB. The editfile has the registered name of the MIB with the suffix REV. For example, the editfile for the CPQHLTH.MIB is CPQHLTH.REV.

You can find the REV editfile in the same directory as the MIBs:

```
\Program Files\HP\Insight Manager 7\compaq\protocol\snmp\Mibs
```

The editfiles that are provided have the addition of modifiable fields called #TYPE, #SEVERITY, and #CATEGORY. These fields have values for trap descriptions. When a MIB is registered using the REV files, the additional information is placed into the database. Once a MIB is registered, a REV file can be created from the database after the MIB is registered.

In the future, if you choose to register a MIB from its source file, the information that is contained only in the REV file will no longer be in the database. In addition, the information would not be in a REV file that was created from the database after the source MIB registration.

You should back up the REV file changes, so if the installed REV editfiles are lost or damaged, you can reinstall them from from your back up copy.

You can use the REV editfile in any of the following ways:

- If an editfile exists, you can edit it and maintain more complete information in the database. You can edit from the Insight Manager 7 or the command line.
- After you have registered a MIB, you can register the REV editfile.
- An accurate and recent MIB is your best source of device management information.

**registering a MIB**

1. Click the **Tools** tab.
2. From the menu, select **SNMP Extensions** and click **MIB Registration**.
3. Select a MIB from the **Unregistered MIBs** column.
4. At **Options for Register**, select either or both file creation options:

- **Create Logfile**
- **Use Editfile.**

Then choose one of the following options:

- **Create Editfile**—Registers the selected MIB (using the source MIB file), and creates a new REV file if one does not exist for the selected MIB.
  - **Replace Editfile**—Registers the selected MIB (using the source MIB file) and overwrites the existing REV file in the MIB folder.
  - **Register Editfile**—Registers the selected MIB using the existing REV file contents to populate the database MIB tables.
5. Click **Register**. When registration is complete, the MIB is removed from the **Unregistered MIBs** column and is highlighted in the **Registered MIBs** column. If you do not see the MIB immediately, scroll to find it.

**why registration fails**

MIB registration typically fails for the following reasons:

- The MIB contains a syntax error—Syntax errors affect the MIB compilation phase. SNMP Extensions can resolve some syntax errors, but if the error cannot be resolved, the registration fails. For example, if the MIB structure is invalid, the MIB cannot be compiled.
- Elements in the MIB are not unique—MIB module names must be unique. If you try to register a MIB with a module name that is already used by another registered MIB, the compile will fail.
- The MIB has dependent MIBs that cannot be found—A new MIB will not have all the components necessary to compile by itself. Most MIBs depend on other MIBs. If a MIB imports variables from other MIBs, the importing MIB needs a copy of the referenced MIBs to compile along with the specified new MIB. The importing MIB will resolve the unknown references from dependent MIBs. If the referenced MIBs are not in the correct directory, use the Upload feature and register them. Then reregister the failed MIB.

**Note:** A registration may appear to fail if the browser times out before registration is complete. However, the registration continues and will be successful as long as none of the failure conditions exist. During a timeout, you will lose your connection. To resume working in Insight Manager 7, log in again.


- unregistering a MIB** Unregistering removes the MIB information from the database along with the dependent MIBs and removes any associated events, whether the information comes from the MIB or from its REV editfile. Unless you remove the MIB from the \Mibs directory, it remains in the **Unregistered MIBs** column.
1. Select the MIB from the **Registered MIBs** column.
  2. Click **Unregister**. When the MIB is no longer registered, the MIB is highlighted in the **Unregistered MIBs** column. You may need to scroll through the list to see the highlighted MIB.
- WARNING:** Unregistering a root MIB, such as MIB-II (RFC1213.MIB), can cause all other MIBs referenced by the root MIB to become unregistered.
- uploading a MIB** MIB Upload browses for the source MIB files and copies them into the MIBs directory. Vendors often provide MIBs through websites. If the MIB you need is on a website, on CD-ROM, or on a diskette, you can upload it to the correct directory:
- ```
\Program Files\HP\Insight Manager 7\compaq\protocol\snmp\MIBs
```
- If the MIB is already in the folder, uploading will fail with the status message `MIB upload failed: <mibName> already exists`. When you rename the MIB, use only alphanumeric characters.
- To upload a file, begin on the **MIB Upload** page.
1. Click the **Tools** tab.
  2. From the menu, select **SNMP Extensions** and click **SNMP MIB Upload**.
  3. On the **MIB Upload** page, click **Browse** to locate the file.
  4. When you locate the MIB, select it and click **Upload**.
- editing registered MIB information** SNMP Extensions modify the database—not the MIB—with new information. HP does not recommend opening the database tables or editing the source MIB. Instead, modify the MIB information using the Edit Registered MIBs Trap Edit features. You can modify the information in the following ways:
- Customize the trap description to include specific instructions, sources of information, or company policy
  - Change the trap type name
  - Change the trap severity if vendor's default severity does not match conditions on your network
  - Specify whether traps are to be ignored. For example, disable informational traps or repeat traps that are generated for non-critical situations. Enable trap handling if the conditions change. Do this on a trap-by-trap basis.
  - Change trap category assignment by moving the trap to a previously defined category

**editing a MIB**

Begin on the **SNMP Extensions MIB Registration** page. Select a MIB from the **Registered MIBs** column.

1. Click **Edit Registered MIB**. The **SNMP Trap Edit** page opens. On the edit page, the traps associated with the selected MIB are displayed for editing.

## SNMP Trap Edit



This page permits you to edit the information associated with the traps from **CPQCLUS.MIB**.

**Edit Trap**

|              |                                                                                                                                                                                                                                                                                        |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name:        | <input type="text" value="cpqClusterNetworkDegraded"/> <input checked="" type="checkbox"/> Enable Trap Handling                                                                                                                                                                        |
| Description: | <div style="border: 1px solid gray; padding: 2px;">           This trap will be sent any time the condition of a cluster network becomes degraded. User Action: Make a note of the cluster network name then check the network for the cause of the degraded condition.         </div> |
| Type:        | <input type="text" value="Cluster Network Degraded"/>                                                                                                                                                                                                                                  |
| Category:    | <input type="text" value="CLUSTER"/>                                                                                                                                                                                                                                                   |
| Severity:    | <input type="text" value="MAJOR"/>                                                                                                                                                                                                                                                     |

2. Click the drop-down list to view the traps that are defined in the MIB. Select one. The trap's corresponding information is displayed. Modify the MIB information in any of the following ways. All are optional.
  - Position the cursor in the **Description** field to modify the text.
  - Position the cursor in the **Type** field and change how the trap is identified in the Insight Manager 7 display.
  - Position the cursor in the **Severity** field and enter your choice of Informational, Minor, Major, or Critical.
  - Select **the Enable Trap Handling** check-box to enable trap handling or deselect it to disable trap handling.
  - Reassign the trap category from the selection in the drop-down **Category** list.
3. Click **Apply** to save your changes or click **Reset** to restore the previous MIB information.

unregistering an installed MIB

When a device is removed from the network, you can remove the MIB that supports it. SNMP Extensions Unregister function also removes all database references to the MIB and any dependent MIBs. If you reinstall the device in the future, reregister the MIB into the database. If you upgrade to a similar device from the same vendor, register the most current MIB that the vendor supplies.

unregistering a MIB from the MIB Registration page

1. Select a MIB from the **Registered MIBs** column.
2. Click **Unregister MIB**. The MIB is removed from the database. It is also removed from the **Registered MIBs** column and placed in the **Unregistered MIBs** column.

**deleting unregistered MIBS**

Deleting a MIB removes the MIB file from the Insight Manager 7 directory.

**Note:** Do not delete an unregistered MIB unless you are certain it is unnecessary, obsolete, or you plan to upload a new version. Because all references to the MIB are removed from the database, you may see error messages regarding the deleted MIB if it is not replaced, but the device it supports remains on the network.

Deleting an unregistered MIB

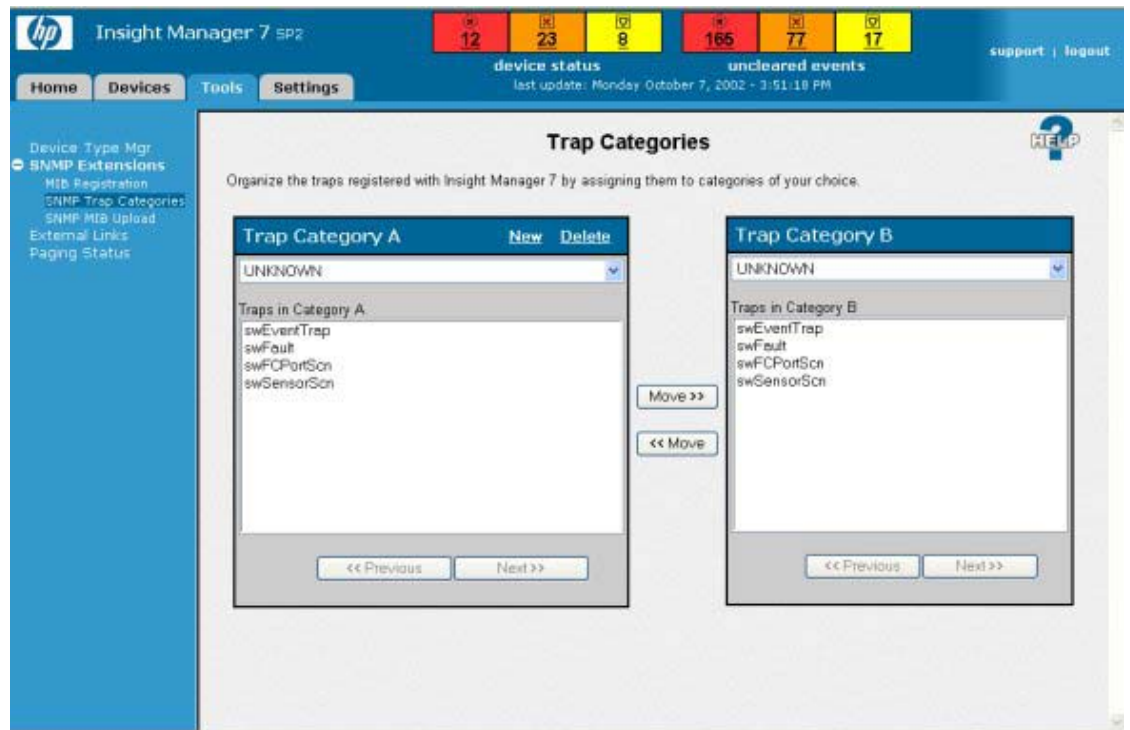
1. Select the MIB from the **Unregistered MIBs** column.
2. Click **Delete Unregistered MIBs**.
3. Click **OK** to confirm the deletion.

using trap categories      Trap Categories are logical groupings of SNMP traps. Categories are used to sort the **Event by Type** criteria list. SNMP Extensions lets you modify existing assignments by moving traps between categories. SNMP Extensions also enables you to create new categories and move traps from the default assignment to the new category.

Insight Manager 7 defines the following default categories:

- **Generic**—Traps from RFC standard MIBs and traps that are not associated with a specific piece of software or a specific device. This category also includes some generic traps from HP MIBs and Digital MIBs.
- **System and Environmental**—Temperature, CPU conditions, memory, chassis, and other related traps generated from the server.
- **Cluster**—Cluster-generated traps, including fail-over, resource sharing, and the physical components that comprise the cluster.
- **NetWare**—Traps specifically generated by a NetWare server. This category includes traps generated by the NWALARM MIB.
- **NDS**—Traps generated by the NDSTRAP MIB.
- **Remote Monitoring and Management**—Traps generated from remote monitoring and management processors, including the Remote Insight Board.
- **Backup**—Traps from software and hardware specifically assigned to a backup or recovery task. Note that tape device-specific traps remain in the **Storage** category.
- **Networking Devices**—Traps from switches, routers, hubs, etc.
- **NIC**—Traps relating to network cards.
- **UPS**—Software and hardware for UPS use.
- **Storage**—Local and remote storage, RAID devices, tape, disk, controllers, SCSI, and IDE devices.

- **Application**—Traps generated by miscellaneous applications, such as the BMC Patrol tools or Load Sharing Facility (LSF) V2.2 for UNIX systems. Note that this does not cover the Novell specific traps. Due to the large volume of NetWare OS-specific traps, Novell traps are categorized separately.
- **Threshold**—Traps generated when monitored variables that are not in a specific category cross a defined threshold.
- **Unknown**—Traps not currently classified. This is the default for any traps not assigned to a specific category.



### changing trap category assignments

1. Click the **Tools** tab.
2. From the menu, select **SNMP Extensions** and click **SNMP Trap Categories**.
3. Click the drop-down list labeled **Trap Category A** to select the source category. Individually select the traps you wish to move.
4. Click the drop-down list labeled **Trap Category B** to select the destination category.
5. Click **Move>>** to move the traps from category A to category B.
6. The display will be updated dynamically to show your action.

### using SNMP Explorer

SNMP Explorer is a MIB Browser. It displays as a link for SNMP devices on the **Device** page. The figure below illustrates the **SNMP Explorer** page that opens from a device link



## SNMP Explorer ?

Device '**SQA-160-227**' can be explored for SNMP information. Note: SNMP exploration requires special software on the device which might not be installed. Consequently, some or all inquiries might be rejected. Only registered MIBs can be explored.

### SNMP Explorer

Registered MIB: rfc1213.mib  
Variable from MIB: sysDescr

#### Variable Display

Type: DISPLAYSTRING Access: READ-ONLY Status: MANDATORY

A textual description of the entity. This value should include the full name and version identification of the system's hardware type, software operating-system, and networking software. It is mandatory that this only contain printable ASCII characters

Status: No device operation performed.

**Note:** To take full advantage of the SNMP Explorer, you should be familiar with MIB-II structure and variables. You can examine MIB variables of any registered MIB in SNMP Explorer with the exception of complex variables, which have OIDs with lists or tables or variable OIDs that require you to specify a specific instance of the OID.

opening the SNMP Explorer:

1. Click the **Devices** tab.
2. From the menu, click **Device Queries**.
3. On the **Device Queries** page, select a device query for devices you know are using SNMP.
4. On the query result list, click the device name link to open the **Device** page.
5. In the **Device Links** group, click the link to **SNMP Explorer**. The **SNMP Explorer** page opens with the SNMP information for the target device as described

| field             | purpose                                                                                                                                                                                         |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Registered MIB    | Name of the MIB being explored. Click the arrow to view all MIBs registered in Insight Manager 7.                                                                                               |
| Variable from MIB | Name of the variable. Click the arrow to view scalar variables in this MIB. This field lists only variables for the selected MIB and may not show all variables that are declared with the MIB. |
| Variable Display  | Characteristics of the variable and a description of the variable. Attributes apply to the selected MIB variable.                                                                               |

| field                    | purpose                                                                                                                                                                                                                                  |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type                     | One of several types, including INTEGER, STRING, IP ADDRESS, COUNTER, TIMETICKS, and GAUGE.                                                                                                                                              |
| Access                   | One of several access types, including READ, WRITE, or READ-WRITE.                                                                                                                                                                       |
| Status                   | The status for the variable in this MIB, such as MANDATORY, DEPRECATED, OPTIONAL, or OBSOLETE.                                                                                                                                           |
| Database Display Field   | Description of the variable and its purpose. Use this field to review the meaning of a trap that includes this variable, to read (GET) other agent information, and to modify (SET) a new value when the variable has READ-WRITE access. |
| SNMP Explorer Status Bar | The result of the last operation on this variable.                                                                                                                                                                                       |

**Note:** SNMP Explorer does not browse MIBs on target devices that are running only IPX.

You can view all kinds of variable information in a MIB. Viewing is equivalent to an SNMP get operation. If you have the appropriate Administrator privileges, you can apply new values on attributes with write access. Writing is equivalent to an SNMP set.

#### viewing variable data

1. From the drop-down box of the **Registered MIB** field, select a MIB.
2. From the drop-down box of the **Variable from MIB** field, select a variable. The variable information is displayed in the **Database Display** field.
3. Continue to select variables of MIBs. After each selection, click **Read Device** to display the value of the variable as was read from the device. The OID, type, and the value at the selected platform are displayed for each variable.

#### writing a new value to the variable

1. From the drop-down box of the **Variable from MIB** field, select a variable. The variable information is displayed in the **Database Display** field.
2. Click **Read Device** to view the MIB variable on the target device.
3. Click **Edit Device**.
4. In the **Database Display** field, enter the MIB variable value you are adding at the target device.
5. Click **Write Value to Device**.

**verifying the SNMP settings**

If you are an administrator, you can change the SNMP settings on the fly. This is useful if you need to change the community string, timeouts, or retries.

1. Click **Show Device Settings**.
2. Change the settings as necessary on the **SNMP Settings** page.
3. Click **Submit** to change the settings or **Reset** to restore them.
4. Click **Return** to go back to the **SNMP Explorer** page.

**managing MIBs from the batch command**

The alternative to using SNMP Extensions from Insight Manager 7 is to use the command line program. The command line interface enables more complex operations, in addition to registering, modifying, and deleting, that you can perform from Insight Manager 7.

The commands are included in the program mCompile.bat. Use the command line interface from a **DOS** command box. Although the purpose of the command line interface is not to debug the MIBs, you can use the command line for this purpose.

**command syntax conventions**

The following table explains how to interpret the SNMP Extensions commands that are described in the following section, "The Command Syntax."

| symbol or convention                | description                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <parameter>                         | Parameters enclosed in angle brackets indicate that something must be added to complete the command, such as a password or parameter. The elements inside the brackets are meant to be placeholders that are replaced with true values without the brackets. For example, mCompile <mibfile.mib> becomes the command line expression:<br><br>> mCompile foo.mib |
| [optional parameters]               | Elements inside the braces are optional.                                                                                                                                                                                                                                                                                                                        |
| - (minus sign) followed by a switch | The switch is optional, such as -D, -f.                                                                                                                                                                                                                                                                                                                         |
| (vertical bar) between two elements | The vertical bar represents a syntax that requires a choice of this OR that. For example,<br><br>>mCompile foo.mib   foo.rev                                                                                                                                                                                                                                    |

**the command syntax**

The command line program expects to find the MIBs in the following directory:

```
\program Files\HP\Insight Manager 7\Compaq\Protocol\smp\Mibs
```

The command line batch file mCompile program has the following batch file procedures:

```
mCompile [-D] [-L <logfile.txt>] [-n "trapHandlerClass"]
<mibfile.mib>
```

The above command enables debug mode. The logfile name is the name of the MIB with the extension .txt. The mibfile name is the name of the MIB with the .mib extension.

```
mCompile [-g] [-C] <mibfile.mib>
```

The above command generates an editfile for corrections. The mibfile name is the name of the MIB with the .mib extension added on.

```
mCompile [-c [-n "trapHandlerClass"] (-C <mibfile.mib> |
<mibfile.rev>)
```

The above command applies changes to the database that were made to the commented REV file. The mibfile name is the name of the MIB with the .mib extension added on. The corresponding REV file has the name of the MIB with the .rev extension.

```
mCompile -f <filelist.txt>
```

The above command registers multiple MIBs. For each MIB to be registered, create a text file to be called by the program. In the file, name the import file that contains a list of MIBs, or list each MIB to be registered on a separate line. The program reads the specified imports and MIB file name and registers each in turn.

```
mCompile -d <mibfile.mib>
```

The above command deletes a registered MIB and any dependent MIBs from the database.

```
mCompile (-l|-t) [<mibfile.mib>]
```

The above command creates a list of all registered MIBs and the traps associated with them.

Commands, MIB names, and file names are case-insensitive. For example mcompile and MCOMPILE execute the same operation. Switches are case-sensitive as described in the following table.

#### command switches

The command line program uses the following switches:

| switches  | purpose                                                                               |
|-----------|---------------------------------------------------------------------------------------|
| -c        | Make database corrections (after a normal mib installation)                           |
| -C        | Compiles a MIB                                                                        |
| -d        | Delete a MIB file (and all MIBs that import it)                                       |
| -D        | Enable debug mode (to screen)                                                         |
| -f        | Specify a filename (with Full Path) containing a list of command lines                |
| -g        | Generate an editfile for database corrections                                         |
| -l        | List of mib files in database                                                         |
| -L        | Generate specified logfile to the \log directory                                      |
| No switch | Default is "compaq.protocol.snmp.trap.GenericTrapNoticeHandler"                       |
| -n        | Java 'Notice' handler Default is:"compaq.protocol.snmp.trap.GenericTrapNoticeHandler" |

**running the  
mCompile command**

The command line program runs from an MS-DOS Prompt window. To open a **DOS** window:

1. From the desktop, click **Start**—>**Run**.

In the **Open** field, enter `cmd.exe`.

2. Click **OK**.

3. Change to the directory where Insight Manager 7 is installed. For example, the command to change the default installation directory is:

```
CD C:\Program Files\HP\HP Insight Manager 7
```

4. On the command line, enter:

```
mcompile.bat
```

When you run the program, options and examples for writing the command are displayed. Reference these when you enter the command.

a command line  
example

The following shows the display of a mCompile command without parameters or switches. The single command presents all mCompile options.

```
C:\Program Files\HP\Insight Manager 7>mcompile

C:\Program Files\HP\Insight Manager 7>runtime\bin\
jre -ms8m -mx750m -cp
lib\jgl3.1.0.jar;.;lib\swing.jar;lib\windows.jar;lib\msxml.jar;lib\
activation.jar;lib\mail.jar
compaq.protocol.snmp.MibMgr.MibCompiler.MibCompilerShell

Trying connection to database using property file:
\config\database.props

Database connection test successful for URL: jdbc:odbc:INSIGHT_DB_V2

User: sa pwd:

    Database Machine:

        SERVER1

    Database Version:

    Microsoft SQL Server 7.00 - 7.00.623 (Intel X86)

        Nov 27 1998 22:20:07

        Copyright (c) 1988-1998 Microsoft Corporation

        Standard Edition on Windows NT 4.0 (Build 1381: Service
Pack 4)

    Database Driver:

        JDBC-ODBC Bridge (SQLSRV32.DLL) 1.1001 (03.70.0623)

Insight Manager 7 Command Line Compiler Usage:

Use one of the following forms:

-----

(1) mCompile [-D] [-L <logfile.txt>] [-n "trapHandlerClass"]
<mibfile.mib>

(2) mCompile [-c [-n "trapHandlerClass"] (-C <mibfile.mib> |
<mibfile.rev>)]

(3) mCompile [-g] [-C] <mibfile.mib>

(4) mCompile -f <filelist.txt>

(5) mCompile -d <mibfile.mib>

(6) mCompile -l [<mibfile.mib>
```

where,

- c Make database corrections (after a normal mib installation).
- C Compile MIB then perform editfile operation.
- d Delete a mib file (and all MIBs that import it).
- D Enable debug mode (to screen).
- f Specify a filename (with Full Path) containing a list of mib files.
- g Generate an editfile for database corrections.
- l List of mib files in database.
- L Generate specified logfile.
- n Java 'Notice' handler.

Default is  
'compaq.protocol.snmp.trap.GenericTrapNoticeHandler'

Examples:

```
mCompile cpqsvrmn.mib
```

```
mCompile -f list.txt
```

```
mCompile my.mib -n my.java.notice.handler
```

```
mCompile -g cpqsvrmn.mib
```

```
mCompile -c cpqsvrmn.rev
```

```
mCompile -d file1.mib
```

**troubleshooting a failed registration**

The MIB may not register. If the MIB registration is unsuccessful, a message is displayed with a possible explanation. Registration most often fails for the following circumstances:

- The program cannot import a dependency file. MIBs often refer to other MIBs, known as dependents. Dependent MIBs must be in the same location as the MIB that names them as dependents. Read the MIB you are registering to find the dependent MIBs.
- The import statement syntax is incorrect. Check the syntax of the import statement and that the MIBs can be found as specified.
- The imported MIB contains invalid syntax or is not a valid MIB file. Some possibilities are an invalid Definition within the MIB structure, duplicate module names, or incorrect syntax for a variable entry.

**Note:** MIBs require varying amounts of time to compile. As long as none of the conditions exist for failure, the MIB continues to compile. If the time required exceeds the browser timeout, you will need to reconnect to Insight Manager 7. When the registration succeeds, the compiled MIB is added to the list of registered MIBs.

**registration error messages**

The command `mcompile` generates progress messages during a compile and displays an error if the registration is unsuccessful. Although, success or failure messages that are generated are the same for both interfaces, you can view the progress in command line mode. The following example shows the progress of the `ntcmgt.mib`.

```
>mcompile ntcmt.mib

>runtime\bin\jre -ms8m -mx750m -cp
lib\jgl3.1.0.jar;.;lib\swing.jar;lib\windows.jar;lib\msxml.jar;lib\activation.jar;lib\mail.jar
compaq.protocol.snmp.MibMgr.MibCompiler.MibCompilerShell ntcmt.mib

Trying connection to database using property file:
\config\database.props

Database connection test successful for URL: jdbc:odbc:INSIGHT_DB_V2
User: sa pwd:

Database Machine:

SERVER1

Database Version:

Microsoft SQL Server 7.00 - 7.00.623 (Intel X86)

Nov 27 1998 22:20:07

Copyright (c) 1988-1998 Microsoft Corporation

Standard Edition on Windows NT 4.0 (Build 1381: Service Pack 4)

Database Driver:

JDBC-ODBC Bridge (SQLSRV32.DLL) 1.1001 (03.70.0623)

++++ Processing file "ntcmgt.mib".
```



```
MapleConnection: Real Close!! protocol.snmp.MibMgr.db.dbSql:173  
freed: false
```

```
Compile Done
```

compiling a MIB with  
an Error:  
badmib.MIB

The following is an example of an invalid MIB. The nctmgt.mib was renamed to badmib.mib and line 65 was commented out. The modification causes a compilation error.

```
>mcompile badmib.mib
```

```
>runtime\bin\jre -ms8m -mx750m -cp  
lib\jgl3.1.0.jar;.;lib\swing.jar;lib\windows.jar;lib\msxml.jar;lib\activation.jar;lib\mail.jar  
compaq.protocol.snmp.MibMgr.MibCompiler.MibCompilerShell badmib.mib
```

```
Trying connection to database using property file:  
\config\database.props
```

```
Database connection test successful for URL: jdbc:odbc:INSIGHT_DB_V2  
User: sa pwd:
```

```
Database Machine:
```

```
SERVER1
```

```
Database Version:
```

```
Microsoft SQL Server 7.00 - 7.00.623 (Intel X86)
```

```
Nov 27 1998 22:20:07
```

```
Copyright (c) 1988-1998 Microsoft Corporation
```

```
Standard Edition on Windows NT 4.0 (Build 1381: Service  
Pack 4)
```

```
Database Driver:
```

```
JDBC-ODBC Bridge (SQLSRV32.DLL) 1.1001 (03.70.0623)
```

```
++++ Processing file "badmib.mib".
```

```
Error: File'badmib.mib'.Error reading MIB: MIB node has no parent
```

```
File: C:\Program Files\HP\Insight Manager  
7\compaq\protocol\snmp\mibs\badmib.mib Line: 65
```

```
Compile Done
```

the referenced  
badmib.mib

Use the following code for badmib.mib as a reference. The code is a copy of the nctmgt.mib with line 65 commented out.

```
--      ema OBJECT IDENTIFIER ::= { dec 2 }

-- BADMIB.mib
--
-- Description:
-- This BAD MIB

NTCMGT-MIB DEFINITIONS ::= BEGIN

IMPORTS
    mgmt, enterprises, NetworkAddress, IPAddress, Counter, Gauge, TimeTicks
        FROM RFC1155-SMI
    OBJECT-TYPE
FROM RFC-1212
    DisplayString
        FROM RFC1213-MIB;

-- DEC-MIB { iso(1) org(3) dod(6) -nترنت(1) private(4) enterprises(1) 36
}

    dec OBJECT IDENTIFIER ::= { enterprises 36 }
-- ERROR LINE: the following line was commented out
--      ema OBJECT IDENTIFIER ::= { dec 2 }

-- textual conventions for types

ObjectType ::= INTEGER {
    unknown(1) ,
    other(2) ,
    share(3) ,
    disk(4) ,
    application(5)
}

PolicyType ::= INTEGER {
    unknown(1) ,
    other(2) ,
    inOrder(3) ,
    random(4) ,
    leastLoad(5) ,
    roundRobin(6)
}

Boolean ::= INTEGER {
    true(1) ,
    false(2)
}

-- The DateAndTime size can be only 8 or 11 bytes long.
DateAndTime ::= DisplayString
FailoverReason ::= INTEGER {
    unknown(1) ,
    other(2) ,
    reconfiguration(3) , -- transaction is a result of human
intervention
    failure(4) , -- transaction is a result of hardware or
software failure
    failback(5) -- transaction is a result of a failback
event
}

SoftwareStatus ::= INTEGER {
```

```

        unknown(1) ,
        other(2) ,
        notInstalled(3) ,
        notRunning(4) ,
        running(5) ,
        runningFailed(6)
    }

-- This MIB extension, private to Digital Equipment Corp., allows for
-- management of Digital NT clusters.
mib-extensions-1          OBJECT IDENTIFIER ::= { ema 18 }
svrSystem                 OBJECT IDENTIFIER ::= { mib-extensions-1 22
}
ntcMgt                    OBJECT IDENTIFIER ::= { svrSystem 3 }

-- groups in ntcMgt

ntcMgtMibInfo             OBJECT IDENTIFIER ::= { ntcMgt 1 }
ntcMgtClusterInfo        OBJECT IDENTIFIER ::= { ntcMgt 2 }
ntcLastTransition         OBJECT IDENTIFIER ::= { ntcMgt 3 }

--
-- ntcMgtMibInfo
--
-- current state of this MIB.
ntcMgtMibMajorRev OBJECT-TYPE
    SYNTAX  INTEGER
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "Major revision of this MIB. Should equal 1."
    ::= { ntcMgtMibInfo 1 }

ntcMgtMibMinorRev OBJECT-TYPE
    SYNTAX  INTEGER
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "Minor Revision of the MIB. Should equal 0."
    ::= { ntcMgtMibInfo 2 }

--
-- ntcMgtClusterInfo
--
-- Lists and states of cluster members, groups and objects.
ntcSoftwareVendor OBJECT-TYPE
    SYNTAX  DisplayString
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "Cluster software vendor name."
    ::= { ntcMgtClusterInfo 1 }

ntcSoftwareVersion OBJECT-TYPE
    SYNTAX  DisplayString
    ACCESS  read-only

```

```
STATUS mandatory
DESCRIPTION
    "Cluster software version string."
 ::= { ntcMgtClusterInfo 2 }

ntcSoftwareStatus OBJECT-TYPE
SYNTAX SoftwareStatus
ACCESS read-only
STATUS mandatory
DESCRIPTION
    "Status of the cluster software: installed, running, failed, etc."
 ::= { ntcMgtClusterInfo 3 }

ntcAlias OBJECT-TYPE
SYNTAX DisplayString
ACCESS read-only
STATUS mandatory
DESCRIPTION
    "Cluster alias name."
 ::= { ntcMgtClusterInfo 4 }

ntcThisMember OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-only
STATUS mandatory
DESCRIPTION
    "Index into the member table of the member that corresponds to this
    node."
 ::= { ntcMgtClusterInfo 5 }

ntcMemberTable OBJECT-TYPE
SYNTAX SEQUENCE OF NtcMemberEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
    "Table of ntcMemberEntry."
 ::= { ntcMgtClusterInfo 6 }

ntcMemberEntry OBJECT-TYPE
SYNTAX NtcMemberEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
    "Lists all nodes that comprise this cluster."
INDEX
    {
        ntcMemberIndex
    }
 ::= { ntcMemberTable 1 }

NtcMemberEntry ::=
SEQUENCE {
    ntcMemberIndex
        INTEGER,
    ntcMemberName
        DisplayString,
    ntcMemberComment
        DisplayString
}

ntcMemberIndex OBJECT-TYPE
SYNTAX INTEGER
```

```
ACCESS read-only
STATUS mandatory
DESCRIPTION
    "Unique index for each entry."
 ::= { ntcMemberEntry 1 }

ntcMemberName OBJECT-TYPE
SYNTAX DisplayString
ACCESS read-only
STATUS mandatory
DESCRIPTION
    "Node name of this cluster member."
 ::= { ntcMemberEntry 2 }

ntcMemberComment OBJECT-TYPE
SYNTAX DisplayString
ACCESS read-only
STATUS mandatory
DESCRIPTION
    "Description of the node."
 ::= { ntcMemberEntry 3 }

ntcGroupTable OBJECT-TYPE
SYNTAX SEQUENCE OF NtcGroupEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
    "Table of ntcGroupEntry."
 ::= { ntcMgtClusterInfo 7 }

ntcGroupEntry OBJECT-TYPE
SYNTAX NtcGroupEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
    "Lists all cluster groups for this cluster."
INDEX      {
            ntcGroupIndex
            }
 ::= { ntcGroupTable 1 }

NtcGroupEntry ::=
SEQUENCE {
    ntcGroupIndex
        INTEGER,
    ntcGroupName
        DisplayString,
    ntcGroupComment
        DisplayString,
    ntcGroupOnLine
        INTEGER,
    ntcGroupFailedOver
        Boolean,
    ntcGroupPolicy
        PolicyType,
    ntcGroupReevaluate
        Boolean,
    ntcGroupMembers
```

```
        DisplayString,
        ntcGroupObjects
        DisplayString
    }

ntcGroupIndex OBJECT-TYPE
    SYNTAX  INTEGER
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "Unique index for each entry."
    ::= { ntcGroupEntry 1 }

ntcGroupName OBJECT-TYPE
    SYNTAX  DisplayString
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "The group name."
    ::= { ntcGroupEntry 2 }

ntcGroupComment OBJECT-TYPE
    SYNTAX  DisplayString
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "Description of the group."
    ::= { ntcGroupEntry 3 }

ntcGroupOnLine OBJECT-TYPE
    SYNTAX  INTEGER
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "Index in the member table of the node that currently controls this
        group."
    ::= { ntcGroupEntry 4 }

ntcGroupFailedOver OBJECT-TYPE
    SYNTAX  Boolean
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "True if this group is failed over from the primary Online server."
    ::= { ntcGroupEntry 5 }

ntcGroupPolicy OBJECT-TYPE
    SYNTAX  PolicyType
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "Reflects the policy of choosing the on-line node."
    ::= { ntcGroupEntry 6 }
```

```
ntcGroupReevaluate OBJECT-TYPE
    SYNTAX Boolean
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
        "Indicates whether the object shall be reevaluated for
        movement to a
        new server when nodes in the group go up or down."
    ::= { ntcGroupEntry 7 }

ntcGroupMembers OBJECT-TYPE
    SYNTAX DisplayString
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
        "This is a list of member names where each name is separated
        by a
        space."
    ::= { ntcGroupEntry 8 }

ntcGroupObjects OBJECT-TYPE
    SYNTAX DisplayString
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
        "This is a list of object names - those that make up this
        group.
        Each name is separated by a space."
    ::= { ntcGroupEntry 9 }

ntcObjectTable OBJECT-TYPE
    SYNTAX SEQUENCE OF NtcObjectEntry
    ACCESS not-accessible
    STATUS mandatory
    DESCRIPTION
        "Table of ntcObjectEntry."
    ::= { ntcMgtClusterInfo 8 }

ntcObjectEntry OBJECT-TYPE
    SYNTAX NtcObjectEntry
    ACCESS not-accessible
    STATUS mandatory
    DESCRIPTION
        "List of all cluster objects."
    INDEX
        {
            ntcObjectIndex
        }
    ::= { ntcObjectTable 1 }

NtcObjectEntry ::=
    SEQUENCE {
        ntcObjectIndex
            INTEGER,
        ntcObjectName
            DisplayString,
```

```
        ntcObjectComment
            DisplayString,
        ntcObjectType
            ObjectType,
        ntcObjectDrives
            DisplayString
    }

ntcObjectIndex OBJECT-TYPE
    SYNTAX  INTEGER
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "Unique index for each entry."
    ::= { ntcObjectEntry 1 }

ntcObjectName OBJECT-TYPE
    SYNTAX  DisplayString
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "Name of the cluster object."
    ::= { ntcObjectEntry 2 }

ntcObjectComment OBJECT-TYPE
    SYNTAX  DisplayString
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "Description of the object."
    ::= { ntcObjectEntry 3 }

ntcObjectType OBJECT-TYPE
    SYNTAX  ObjectType
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "Type of cluster object - disk, share, app..."
    ::= { ntcObjectEntry 4 }

ntcObjectDrives OBJECT-TYPE
    SYNTAX  DisplayString
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "If instance is a disk, this object is a list of comma
        separated drive
        letters (e.g. F:,G:)."
    ::= { ntcObjectEntry 5 }

--
-- ntcLastTransition
--
```



```
-- Information that reflects the last significant event (failover,
failback,
-- etc)
-- Note - this is not a valid group but is a repository for those
variables
-- which need to be returned in a trap. Requesting a get or get-next
of any
-- variables in this group will result in a no such name error.
ntcLastTransMember OBJECT-TYPE
    SYNTAX INTEGER
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
        "This is the index of the node in the ntcClusterMemberTable"
    ::= { ntcLastTransition 1 }

ntcLastTransGroup OBJECT-TYPE
    SYNTAX INTEGER
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
        "This is the index of the group in the ntcClusterGroupTable"
    ::= { ntcLastTransition 2 }

ntcLastTransOnline OBJECT-TYPE
    SYNTAX Boolean
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
        "true if this cluster member just gained control of this
group"
    ::= { ntcLastTransition 3 }

ntcLastTransTimestamp OBJECT-TYPE
    SYNTAX DateAndTime
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
        "time of the last transition"
    ::= { ntcLastTransition 4 }

ntcLastTransSequence OBJECT-TYPE
    SYNTAX INTEGER
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
        "This is a sequence number maintained by the agent"
    ::= { ntcLastTransition 5 }

ntcLastTransReason OBJECT-TYPE
    SYNTAX FailoverReason
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
        "reason for the transition - hardware/software problem or
user
initiated"
    ::= { ntcLastTransition 6 }
```

```
--
--      TRAP: ntcTransitionTrap
--
ntcTransitionTrap TRAP-TYPE
    ENTERPRISE ntcMgt
    VARIABLES {
        ntcLastTransMember,
        ntcLastTransGroup,
        ntcLastTransOnline,
        ntcLastTransTimestamp,
        ntcLastTransSequence,
        ntcLastTransReason }
    DESCRIPTION
        "Generated when a group transition occurs (failover or
failback)."
```

```
::= 100
```

```
END
```

**for more  
information**

To learn more about Insight Manager 7, see the *Insight Manager 7 Technical Reference Guide*, or visit our website at:

<http://www.hp.com/servers/manage>

under **Management**.

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