Integrating Compaq Insight Manager with Cabletron SPECTRUM Enterprise Manager

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Contents

Chapter 1
About This TechNote

The purpose of this TechNote is to provide customers who are currently using or considering using Cabletron SPECTRUM in their environment with the ability to manage their Compaq equipment from one Enterprise Console. It also provides information to assist future customers in selecting the appropriate Enterprise Management platform for their environment.

The information presented in this document deals with SPECTRUM version 4.0, rev 3, and is based on technical knowledge acquired while testing the integration.

This TechNote covers the integration of Compaq Insight Manager with Cabletron's SPECTRUM Enterprise Management Environment and is intended for Network Administrators and System Integrators who have knowledge of Compaq Insight Manager and Cabletron SPECTRUM. It focuses on specific integration points for Compaq servers, desktops, portables and professional workstations.

This Technote provides:

- An understanding of the Compaq Insight Manager/Cabletron SPECTRUM integration.
- Sample scenarios that describe possible uses of the integration.
- Differences in the management of servers and desktops.
- Integration features of Compaq Events in the SPECTRUM Enterprise Alarm Manager.

Additional Resources to Use

The following list of resources, used throughout this TechNote, provide additional information on Compaq Insight Manager and Cabletron SPECTRUM:

- Compaq Management CD

  This CD contains the Compaq Insight Manager Online User Guide that explains how to use Compaq Insight Manager. The CD is included with all Compaq Server products.

- SPECTRUM Documentation CD

  Cabletron provides an extensive library of documentation on CD for the installation, configuration, administration, and operation of the SPECTRUM product. The following documents contain reference information relevant to this TechNote:
  - *Administrator's Reference*
  - *Compaq Insight Manager Management Module Guide*
  - *Application View Reference*
  - *Getting Started with SPECTRUM 4.0 for Administrators*
  - *Getting Started with SPECTRUM 4.0 for Operators*
  - *GIF Editor*
  - *How to Manage Your Network with SPECTRUM*
  - *Operators Reference*
  - *Portable Management Application Tools Guide*
  - *Report Generator User's Guide*
  - *Third Party PC and Workstation Management Module Guide*

- Cabletron Home Page: http://www.cabletron.com

- Compaq Home Page: http://www.compaq.com

- Compaq Insight Manager Home Page:

  http://www.compaq.com/products/servers/management/cim/index.html

Document Conventions

Table 1-1 lists the conventions used to distinguish elements of text in this document:

Table 1-1
Document Conventions

Convention	Use
OK, **CANCEL**	Window command button labels appear in bold caps.
CTRL + DEL	Keyboard keys appear in bold caps. When you see a plus sign (+) between two keys, hold down the first key while you simultaneously press the second key.
c:\dirname\filename.exe	Path Names of items such as files, directories, resources, groups, and services appear in bold italics.
Select **Item** → **Item**	Items you select from a pull-down menu appear in bold initial caps, separated by arrows for each submenu item.
SMALL CAPITALS	Represent key names such as CTRL.
Bold	Represents system stored procedures and user-entered text.
Italics	Represents database names, table names, column names, index names and variables.
`Monospace`	Represents examples, displayed text, and error messages.
[brackets]	Identify optional items in syntax. Type only the information within the brackets; do not type the brackets.
{braces}	Identify required items in syntax. Type only the information within the braces; do not type the braces.
… (ellipsis)	Indicates that you can repeat the previous syntax item.
| (vertical bar)	Means "or" and signifies that you can choose only one of the items within the brackets or braces.
USER INPUT	Information to be entered by the user is shown in uppercase and in a different typeface.

Chapter 2
Integration Feature Summary

SPECTRUM is Cabletron's Network Management System for large-scale, multi-LAN, multi-node communication networks. SPECTRUM is based on a client/server model. The client, which provides the graphical user interface, is called SpectroGRAPH, and the server, which includes the SPECTRUM knowledge base, is called SpectroSERVER.

SPECTRUM was initially developed to manage Cabletron network equipment. It has since been expanded to manage products from other network product vendors, as well as computing devices from Enterprise Servers (Unix and NT) all the way to desktops. These devices include:

- Routers
- Hubs
- Bridges
- Enterprise Servers
- Compute Nodes
- Desktops
- Professional Workstations

SPECTRUM Enterprise Manager integrates with Compaq Insight Manager, enabling SPECTRUM to manage Compaq systems within a distributed network. Compaq Insight Manager affords easy management of servers and desktops by providing intelligent monitoring and alerting, remote maintenance, and visual control. When combined with SPECTRUM, Compaq Insight Manager's functional capabilities expand, providing a broad range of centralized functionality in managing multiple technologies in a heterogeneous distributed environment.

SPECTRUM gathers information by communicating directly with the Compaq Insight Management Agents. SPECTRUM automatically notifies the Administrator through the SPECTRUM console when a situation requires attention. Automatic problem filtering is possible through the Enterprise Alarm Manager.

Cabletron's integration into SPECTRUM is with Management Modules. The Compaq integration is called the Compaq Management Module.

By monitoring Compaq Insight Management Agents, the Compaq Management Module (MM) provides the ability to manage fault conditions, monitor performance, and control security and configuration.

There are several integration points:

- Autodiscovery of Compaq Devices
- Views of Compaq Specific MIBs
- Expansion Board View
- Compaq Alarm Integration
- Setting of Compaq Specific Thresholds
- Support for Compaq Servers, Desktops, Portables and Professional Workstations

AutoDiscovery of Compaq Devices

SPECTRUM has an AutoDiscovery feature that automatically discovers devices on the network. After installation of SPECTRUM and the Compaq Management Module (outlined in Chapter 4), an AutoDiscovery can be initiated. SPECTRUM searches the net and discovers devices. If the device is a Compaq device and is running the Compaq Insight Management Agents, SPECTRUM recognizes it as a Compaq device and represents it as such on the map.

AutoDiscovery can be run on any level of the network. It does not have to discover the entire network each time it is executed. Specific subnets can be identified as targets for AutoDiscovery.

Please refer to *Getting Started with SPECTRUM 4.0 for Administrators* for specific details on running the AutoDiscovery feature.

Views of the Compaq Specific MIBs

To complement the network level monitoring of SPECTRUM, hardware-level component information for Compaq servers, desktops, and professional workstations can be monitored and managed using the Compaq Management Module. The following Management Information Base (MIB) categories are represented in the Compaq Management Module:

- Compaq Host OS
- Compaq IDA
- Compaq Server Health
- Compaq Storage Systems
- Compaq SCSI Sub-Systems
- Compaq System Information
- Compaq Thresholds

Each of these categories appears as an icon within the Application area of the SPECTRUM Nodeview, as shown in Figure 2-1.

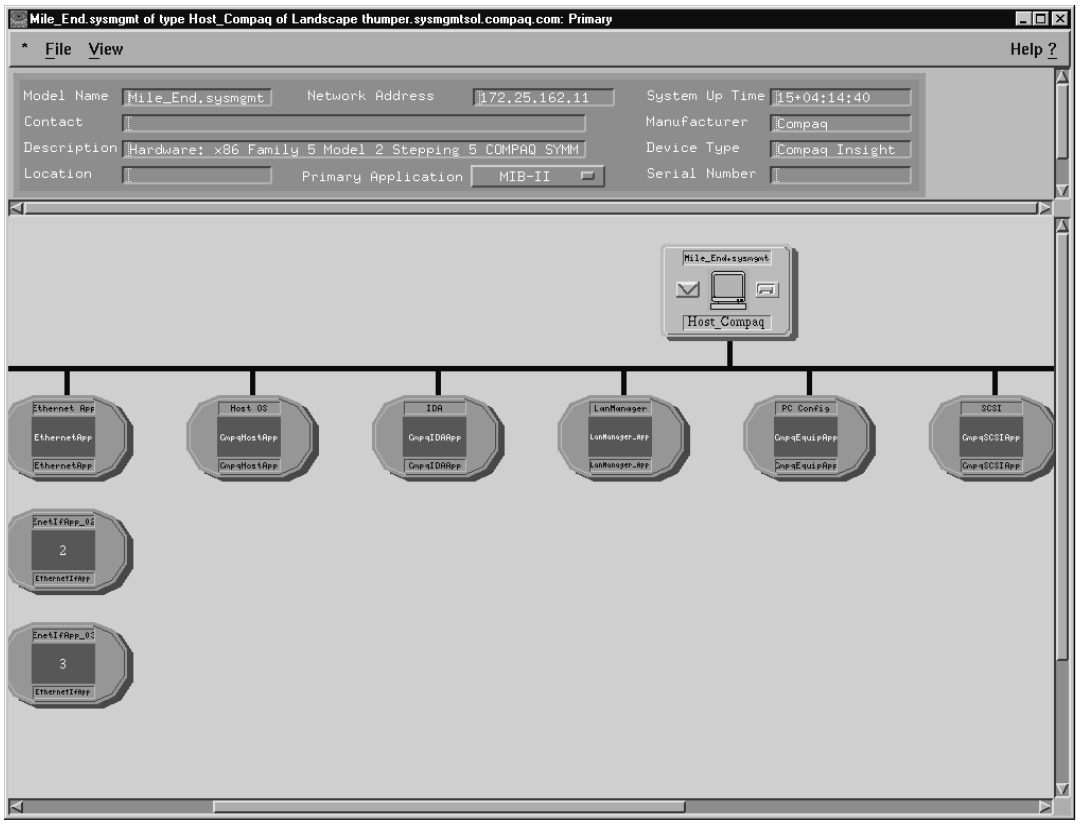

Figure 2-1. Nodeview Screen

Views can be obtained by moving the cursor over the desired application and clicking the right mouse button. A menu appears that shows the MIB items for that group. An example of this would be to click on the 'HostOS' icon. The menu would appear with the following items to choose from:

- Configuration
- OS Common Modules
- OS CPU Utilization
- OS File System Table
- OS Info
- OS Interface Physical Map
- OS Running Software

Output is generally in a tabular format. For example, if the selected menu choice queried a server to see which IDA disks reside within a server, SPECTRUM would query the server and display the following screen:

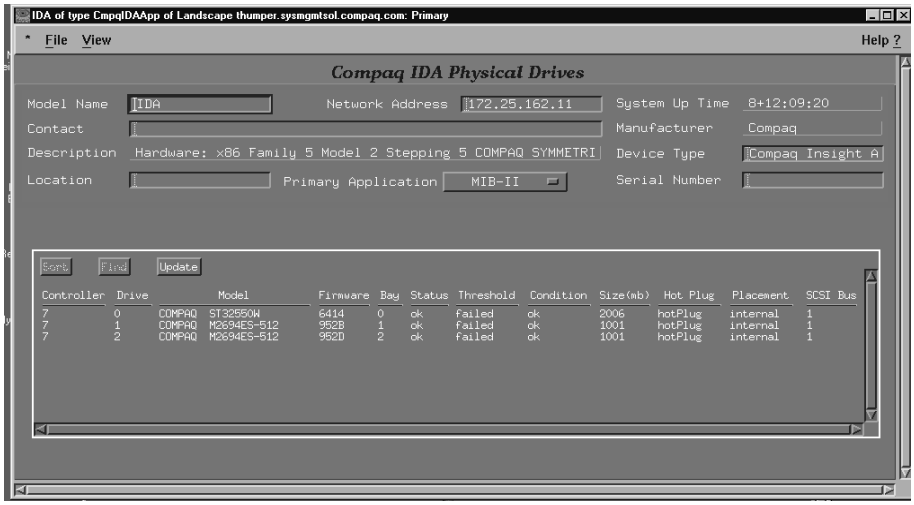

Figure 2-2. Compaq IDA Physical Drive screen

Expansion Board View

The integration provides for a view of the expansion boards in a Compaq server. This view is available for Compaq servers running the Compaq Insight Management Agent. The view provides a quick look at the boards installed in the server. Further information, such as utilization, CPU speeds, NIC type and speed, can be obtained through this view. The view is accessed by moving the mouse over the Nodeview icon and clicking Device, then Expansion Boards.

Note: Board views of desktops, portables, and Professional Workstations are not currently available.

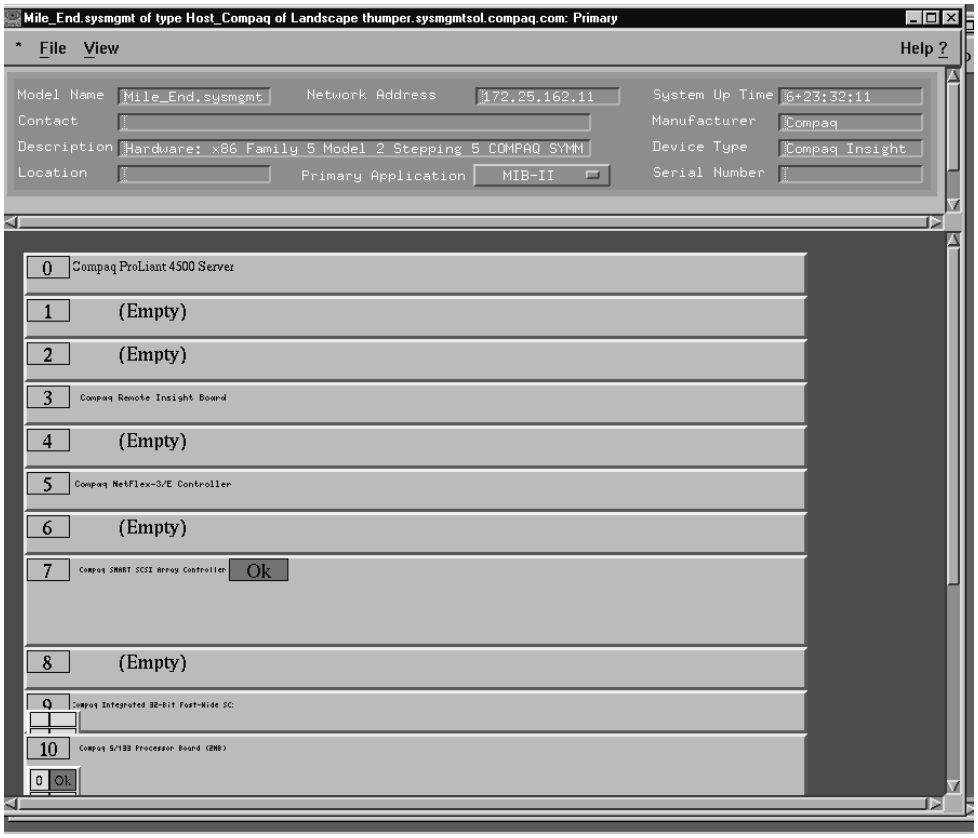

Figure 2-3. Expansion Board View

Compaq Alarm Integration

The SPECTRUM/Compaq Insight Manager integration includes an integration of Compaq Insight Manager Events and Alarms into the SPECTRUM Enterprise Alarm Manager (EAM). This provides such things as color code status of the icons, event correlation within the EAM that brings the real problem to the forefront, ability to view an actual event, possible causes, and suggested fixes.

The Alarm integration also allows SPECTRUM to have knowledge of Compaq equipment when determining problems on a network wide basis. This means that SPECTRUM is able to detect a problem, such as a disk failure, and not assume the problem is network related. This allows an Information Systems organization to be more proactive in determining problems on the Wide Area Network.

Setting of Compaq-Specific Thresholds

Through the Application view, SPECTRUM allows for the setting of Compaq-specific thresholds. Through the setting of thresholds, disk utilization, CPU utilization, Thermal Conditions, and EISA Bus utilization can be monitored. Settings are on a per-machine basis.

Support for Compaq Desktops, Portables and Professional Workstations

Support for Compaq desktops and portables is available as long as the desktop is running the Compaq Insight Management Agent. Desktops and portables support a subset of the MIB. Refer to the *Compaq Insight Manager Online User Guide* for details. Information on items such as CPU utilization, disk drive information, disk utilization, and serial numbers can be obtained. Compaq events and alarms from desktops are recognized, and color status changes occur.

Support for Compaq Professional Workstations is very similar to that of Compaq servers. This is because the Professional Workstations run the Compaq Insight Management agents. The only difference is that the Expansion Board View is not currently available.

Chapter 3
Preinstallation Considerations

Hardware and Software Requirements

Before beginning the installation, you should be familiar with the *SPECTRUM Core Software Release Notice* (SRN), which specifies current hardware and software requirements for each of the platforms on which SPECTRUM is supported. The SRN also describes new features and identifies any known anomalies associated with the installation process.

Table 3-1

Recommended Minimum System Requirements for SPECTRUM

Type of Installation	Minimum Swap Space	Minimum Physical RAM	Minimum Available Disk Space
SpectroSERVER	256MB	96MB	300 MB SCSI
SpectroGRAPH	128MB	64MB	300 MB SCSI

Note: Cabletron recommends that SpectroSERVER and SpectroGRAPH be on separate machines when SPECTRUM is installed on the Windows NT platform.

Disk and RAM Requirements

- Recommended swap space should be twice the minimum installed RAM.
- Minimum Available Disk Space is for SPECTRUM ONLY.
- Total Disk Required = OS + swap + SPECTRUM + additional for users/modeling.
- Windows NT: 1-GB SCSI is required to meet "Total Disk Required" as noted above.

Additional Hardware Requirements

- Intel-based Pentium 150 MHz or Greater CPU.
- Video Card with 4 MB of memory, 65K color support and 1024x768 resolution.
- 17-inch color monitor or larger (recommended) for SpectroGRAPH running GUI clients.
- CD-ROM Drive.

Chapter 4

Installing the Compaq Management Module

Installation as part of the initial SPECTRUM installation

The Compaq Management Module is provided on the SPECTRUM CD and is installed during the installation of SPECTRUM by acquiring the proper extraction key from Cabletron. Follow the instructions in the *SPECTRUM Installation Guide*.

To test if the installation of the module was successful, create a new model by IP. Compaq should be listed in the available models. If Compaq is not an available model, there may be a problem with your keys. Contact Cabletron for new keys.

Installation into an existing SPECTRUM environment

The same process that is used to initially install SPECTRUM is used when adding a module later, such as the Compaq Management Module. Follow the *SPECTRUM Installation Guide* using the extraction key provided by Cabletron. The Module Selection Screen appears with the current installation base selected. Select the Compaq Module and deselect all others. This installs only the Compaq Management Module.

SpectroSERVER Catalogs and SpectroGRAPH Component Considerations

If a customer has multiple SpectroSERVER sites the Compaq Management Module must be installed at all sites; SpectroSERVERs must be in sync at all times. If the module is not installed at all sites there will be a problem not only with graph components but also with the database backups. Contact Cabletron for licensing details.

Chapter 5
Using the Integration

Modeling of Compaq Devices

Modeling of Compaq devices is done through two methods. One method is through Autodiscovery, as discussed in Chapter 2. The other way is to manually model a Compaq device.

Manual modeling is done by navigating to the View where the model is to be placed. Select **File → Edit.** Then select **Edit → New Model**. A dialog box appears with the available models, as shown in the Figure 5-1.

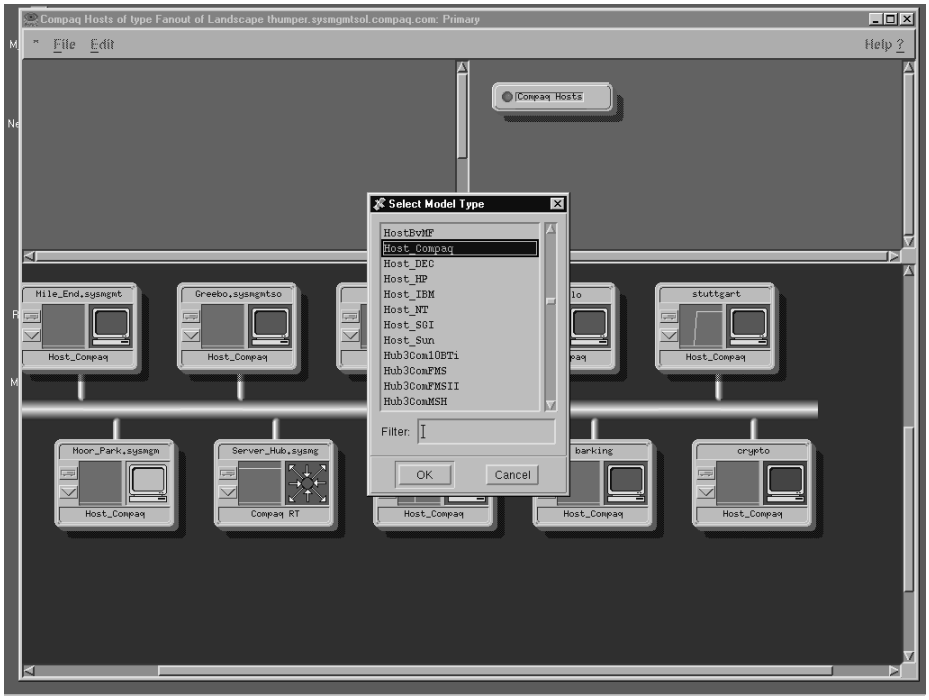

Figure 5-1. Select Model Type

Scroll down until the model ‘Host_Compaq’ appears, then double-click on it. This displays a dialog box that asks about the device, as shown in Figure 5-2.

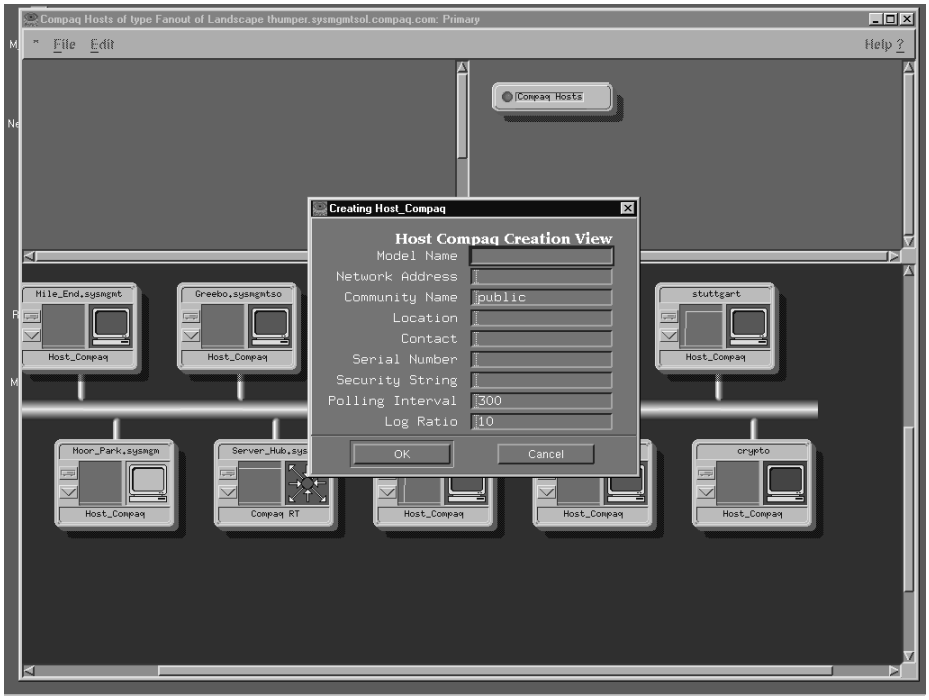

Figure 5-2. Host Creation View

Enter the appropriate information about the Compaq device being modeled. Click **OK**. SPECTRUM goes out to the device to verify that it is a Compaq device through detection of the Compaq Insight Management Agents. After the Agents are detected, an icon depicting the Compaq device is added to the View.

Using the Expansion Board View

This view is a logical representation of the expansion boards that can be installed in the host Compaq chassis. The expansion boards can include the system board, the Intelligent Drive Array (IDA) board, and the processor board. The view may also show non-intelligent boards and empty slots. The Expansion Boards Device view provides menu and double-click zone access to the views that monitor the boards.

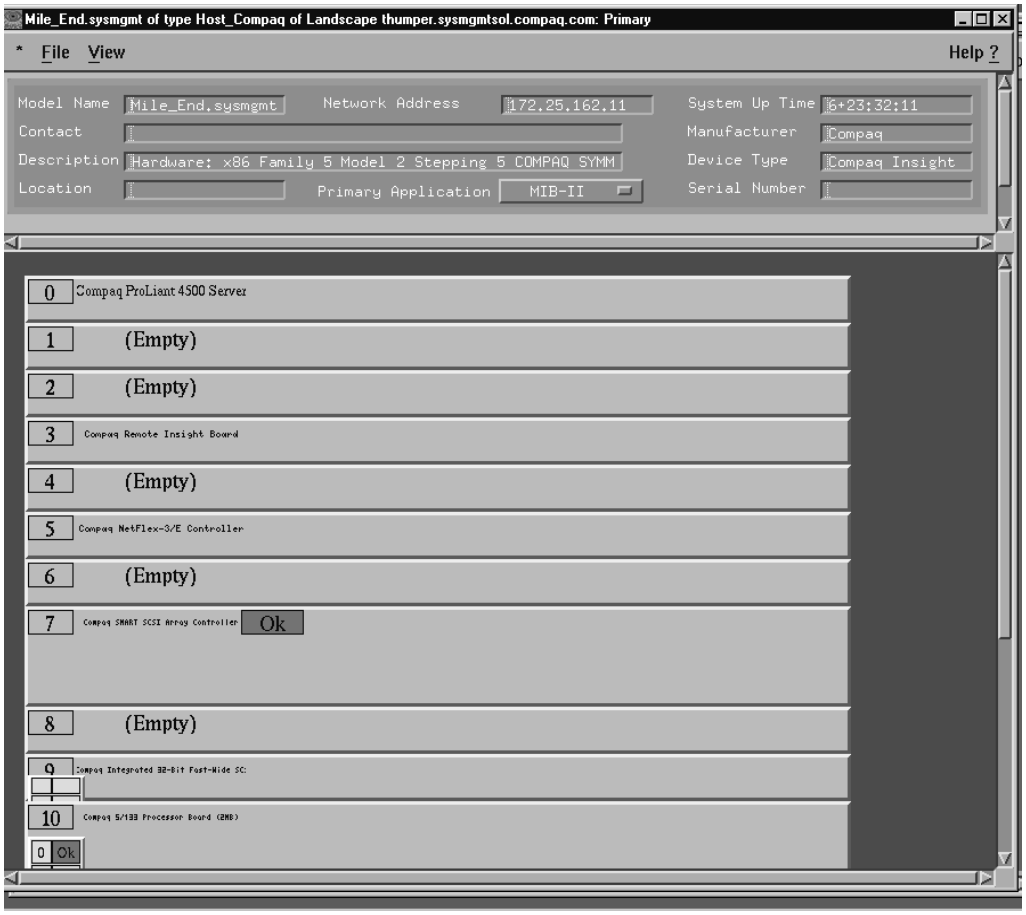

Figure 5-3. Expansion Board View

Utilization of CPU's can be seen by double clicking **OK**. Utilization is displayed in 1,5, and 30 minute utilization increments.

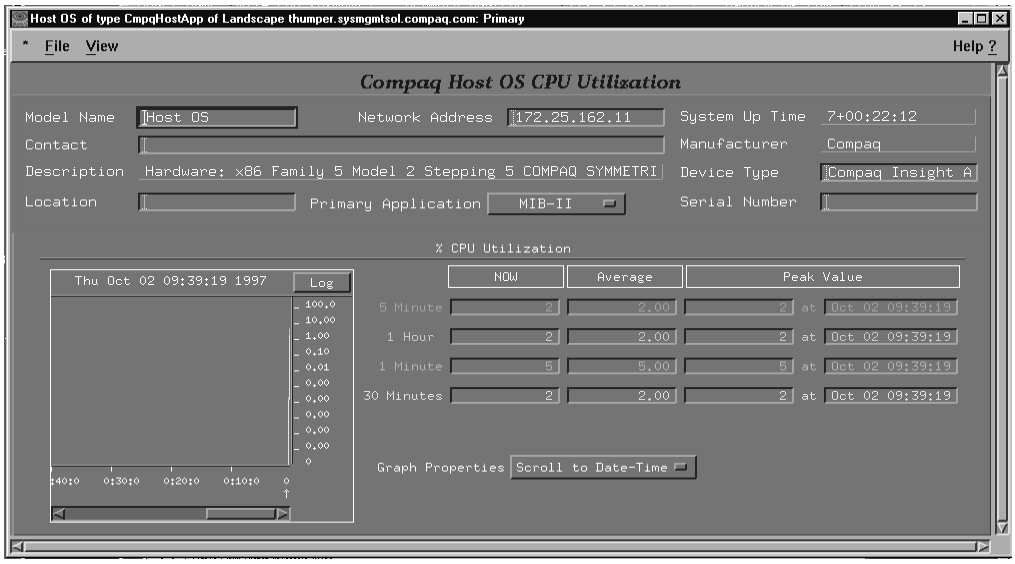

Figure 5-4. Compaq Host OS CPU Utilization

Note: The Compaq Management Module only provides information on EISA BUS slots at this time.

Setting Compaq-Specific Thresholds

Thresholds are values set to trigger alarms and roll up alarm conditions. There are two types of thresholds that can be set through SPECTRUM: thresholds for alarms and thresholds for roll ups. Alarm thresholds are device specific; some devices allow you to set thresholds for abnormal conditions. The roll up threshold values determine the roll up condition color for models that contain the device generating an alarm.

Based on your experience with the network, you may want to set critical values within some or all devices that will cause alarms to be generated if these values are exceeded. These alarm thresholds are set in the configuration views for the particular device. SPECTRUM's integration with Compaq Insight Manager allows for the setting of thresholds on items that can be used to best understand the performance of the Compaq system. An example would be to set thresholds on disk space utilization, CPU utilization, and NIC utilization of a system that has degraded performance. A client machine could be monopolizing a server by repeated writes to a disk drive on the server. By setting thresholds, this can be determined by tracking the disk utilization in conjunction with the NIC utilization.

Thresholds are set through the application view of the system. The threshold application has two separate sets of variables than can be used. These two sets are called the Application Thresholds (App_Thresholds) and the Interface Thresholds (IF_Thresholds). Access to either of these is through a menu. Move the mouse over the Threshold Icon, then click the right mouse button. A menu appears as shown in Figure 5-5.

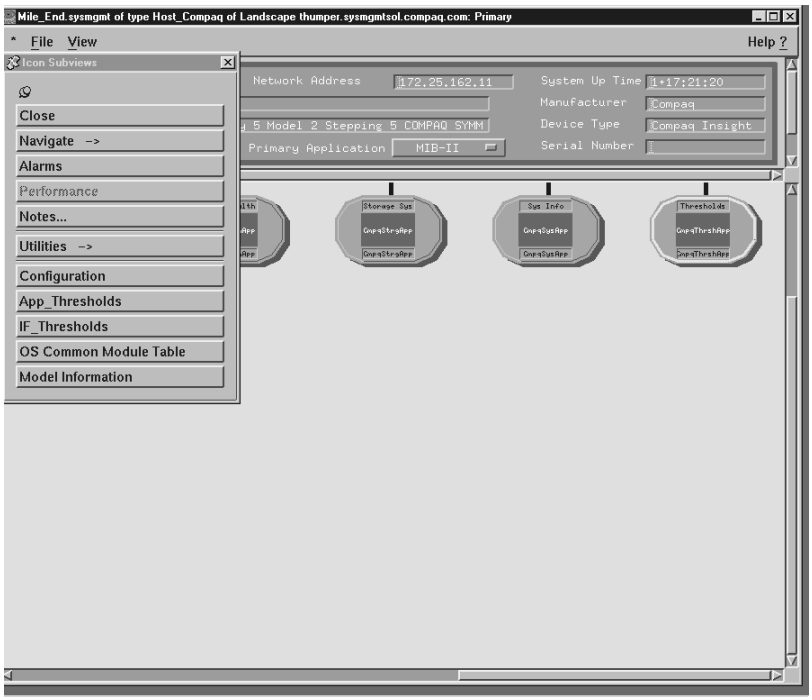

Figure 5-5. Threshold Menu

For the purposes of this discussion, the Application Threshold Editor is used. Click on the *App_Thresholds* button to display the *Compaq Server Threshold Editor*. At this point, knowing the Compaq MIB tree is very useful. As shown in Figure 5-6, the entities available to have threshold settings applied are displayed in a Windows Explorer-type output.

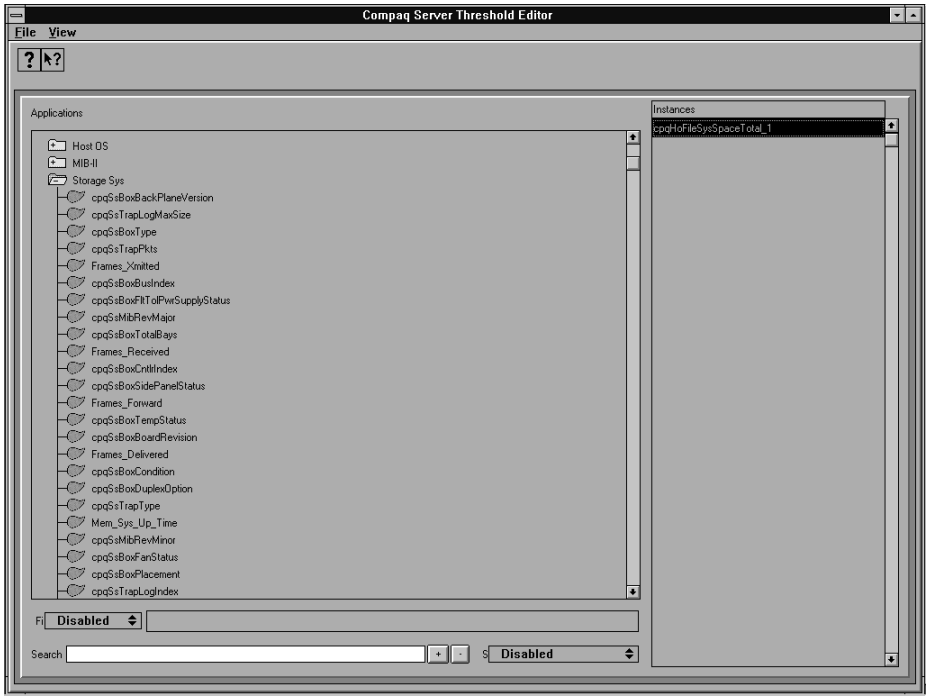

Figure 5-6. Compaq Server Threshold Editor

Find the desired entry to set the threshold on. Double click the entry using the left mouse button. This places the entry in the right box of the Threshold Editor.

Go to the right box and move the mouse over the entry, then double click the left mouse button. This displays the actual *Set Threshold* window. Typical settings are Polling Intervals, Threshold Top, and Threshold Bottom. Polling intervals are values that direct the Agent in how often it should poll the machine.

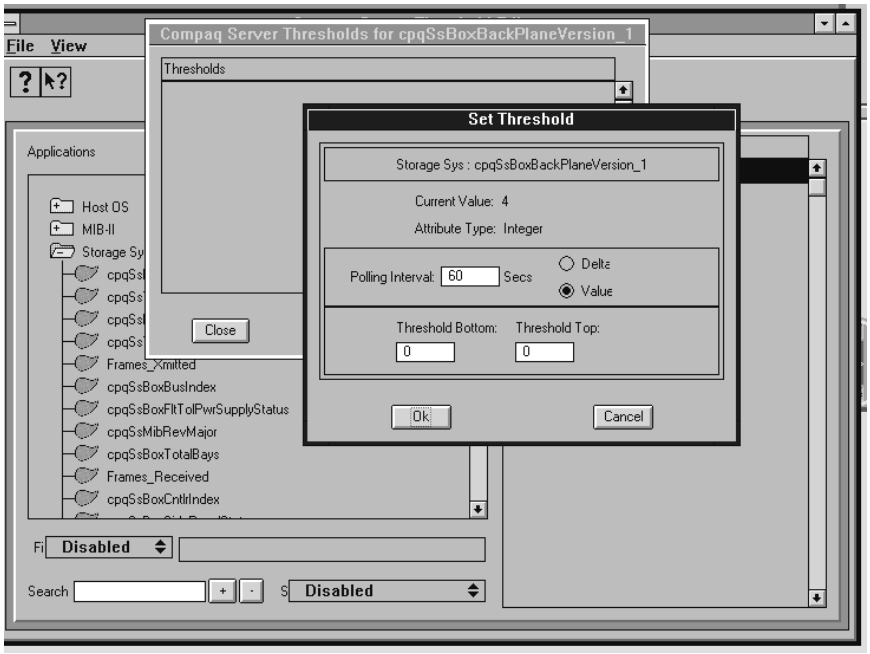

Figure 5-7. Set Threshold Window

After setting desired thresholds, click **OK**. The thresholds are now set and an event is sent to the Event Manager when they are exceeded.

Chapter 6
Sample Management Solution Scenarios

This chapter provides scenarios that illustrate how SPECTRUM uses the Compaq Management Module (MM) to help diagnose network problems. The following solution scenarios are discussed in this chapter:

- Automating Event Management of Compaq Systems
- Compiling Compaq MIBs into the SPECTRUM MIB Browser

These scenarios are only suggestions on how to use Compaq Insight Manager and the SPECTRUM Compaq MM. There are many other ways the two can be used together. For more information, refer to the documentation for Compaq Insight Manager, Cabletron SPECTRUM, and the Compaq Management Module listed in Chapter 1 of this Technote.

Automating Event Management of Compaq Systems

When a Compaq alarm occurs, it is added to the list of alarms in the Alarm List Panel of the Enterprise Alarm Manager (if it does not match the filtering criteria). The related alarm information is recorded in the Event Log. An alarm is removed from the alarm list when the condition causing it is cleared. Double-click an alarm in any column of the Alarm List Panel to display detailed information for that alarm in the Alarm Information Panel.

Assigning a Troubleshooter

The repair management feature of the Enterprise Alarm Manager allows you to assign any troubleshooter your User model has created to selected alarms from the Alarm List Panel. Assigning a troubleshooter to an alarm automatically acknowledges the alarm. Troubleshooter assignments are canceled when the alarm is cleared.

All activities related to repair are recorded in the event log. To assign a troubleshooter to an alarm, perform the following steps:

1. Click an alarm to select it in the Alarm List Panel. Use Shift-Select to select multiple alarms. When selected, the alarm is highlighted.
2. Select **Assign Troubleshooter...** from the **Actions** menu, or click on the Assign Troubleshooter tool bar icon. The Assign Troubleshooter dialog displays a list of possible troubleshooters.
3. Select a troubleshooter from the list, then click **OK**. The selected troubleshooter is now assigned to the selected alarm(s).

To see which troubleshooter is assigned to an alarm, double-click the alarm in the Alarm List Panel. The details of that alarm appear in the Alarm Information Panel. Click the Troubleshooter tab to verify that the appropriate troubleshooter has been assigned to the alarm.

Unassigning a Troubleshooter

The repair management feature of the Enterprise Alarm Manager allows you to unassign a troubleshooter from the list of selected alarms in the Alarm List Panel. Troubleshooter assignments are canceled when the alarm is cleared. A confirmation dialog is displayed before unassigning a troubleshooter.

To unassign a troubleshooter from one or more alarms, perform the following steps:

1. Click an alarm to select it in the Alarm List Panel. Use Shift-Select to select multiple alarms. When selected, the alarm is highlighted.
2. Select **Unassign Troubleshooter** from the **Actions** menu, or click the Unassign Troubleshooter tool bar icon.
3. Click **OK** in the confirmation dialog. The troubleshooter is now unassigned from the alarm.

To check that the troubleshooter has been unassigned from an alarm, double-click on the alarm in the Alarm List Panel. The details of that alarm appear in the Alarm Information Panel. Click the Troubleshooter tab to see that the troubleshooter is no longer assigned to the alarm.

Setting the Administrative Status

Enterprise Alarm Manager includes an option for setting the administrative status for any alarm or set of alarms. This repair management feature of the Enterprise Alarm Manager can be an aid in Compaq alarm management and report generation. When setting the status of selected Compaq alarms, you are prompted for new status text.

To set the status of selected alarms:

1. Click a Compaq alarm to select it from the Alarm List Panel. Use Shift-Select to select multiple alarms. When selected, the alarm is highlighted.
2. Select **Set Status...** from the **Actions** menu, or click the Set Status tool bar icon. The Set Status dialog is displayed.
3. Enter the appropriate information in the text area of the Set Status dialog.
4. Click **OK** to set the new status for the alarm(s).

Customizing the Enterprise Alarm Manager

You can set filters to establish the criteria by which the list of Compaq alarms is displayed. These filtering subsets make it possible for you to customize your Enterprise Alarm Manager application to display Compaq alarms appropriate to your networking needs. Only those Compaq alarms that meet all filtering criteria set by the user are displayed. The Filter dialog displays several tabbed pages for setting various types of alarm filters. The options available with each filter are retrieved from the database that is being used to model your network.

You can modify the Enterprise Alarm Manager by selecting a parameter on which to sort the alarms. You may only sort on one parameter at a time. The Compaq Alarms are grouped by sorting on model type.

To sort:

1. Select **Sort** from the main menu bar.
2. Select the desired sort field. Possible sorting options are:

   Condition
   Date/Time
   Model Type
   Model Name
   Landscape

Compiling Compaq MIBs into the SPECTRUM MIB Browser

SPECTRUM has a tool that is used for 'walking' the MIBs of a device. The tool is called MibTool. The Compaq MIBs can be compiled into this MibTool, which displays a Windows Explorer type interface for walking the MIBs.

The MIBs must be edited prior to compiling. The SPECTRUM MibTool does not gracefully handle comments at the beginning of the MIB files. Therefore, the files must be edited and the comments at the beginning of each file removed. Remove the lines at the beginning of each file that begin with a dash. For example, the following lines would need to be deleted from the Host Operating System MIB File:

```
-****************************************************************************
--
--              Host Operating System Information
--       Management Information Base for SNMP Network Management
--
--
--    Copyright 1997, Compaq Computer Corporation.
--    All Rights Reserved.
--
--    The information in this document is subject to change without notice.
--
--    COMPAQ COMPUTER CORPORATION SHALL NOT BE LIABLE FOR TECHNICAL
--    OR EDITORIAL ERRORS OR OMISSIONS CONATINED HEREIN; NOR FOR INCIDENTAL
--    OR CONSEQUENTIAL DAMAGES RESULTING FROM THE FURNISHING, PERFORMANCE,
--    OR USE OF THIS MATERIAL.
--
--    Refer to the READMIB.RDM file for more information about the
--    organization of the information in the Compaq Enterprise.
--
--    The Host OS MIB provides operating system information, such as
--    name, version, file system information, software running, and more.
--
--    The Compaq Enterprise number is 232.
--    The ASN.1 prefix to, and including the Compaq Enterprise is:
--         1.3.6.1.4.1.232
--
-- ****************************************************************************
```

Once the files have been edited and the comments are removed, bring up the Mibtool by clicking View, then selecting Utilities, and then clicking on MibTools. This displays the MibTools, as shown in the Figure 6-1.

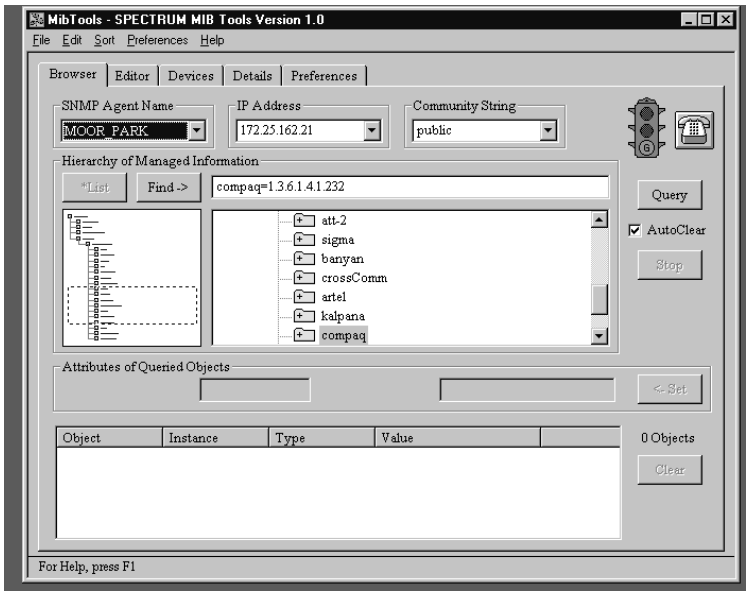

Figure 6-1. MibTools Utility

To compile the Compaq MIBs, click the Editor tab. This displays the Editor mode. At the right of the pane is a dialog box labeled *Text File*. Click on the icon to the right of this dialog box. This displays a window that asks for the location of the MIB files as shown in Figure 6-2:

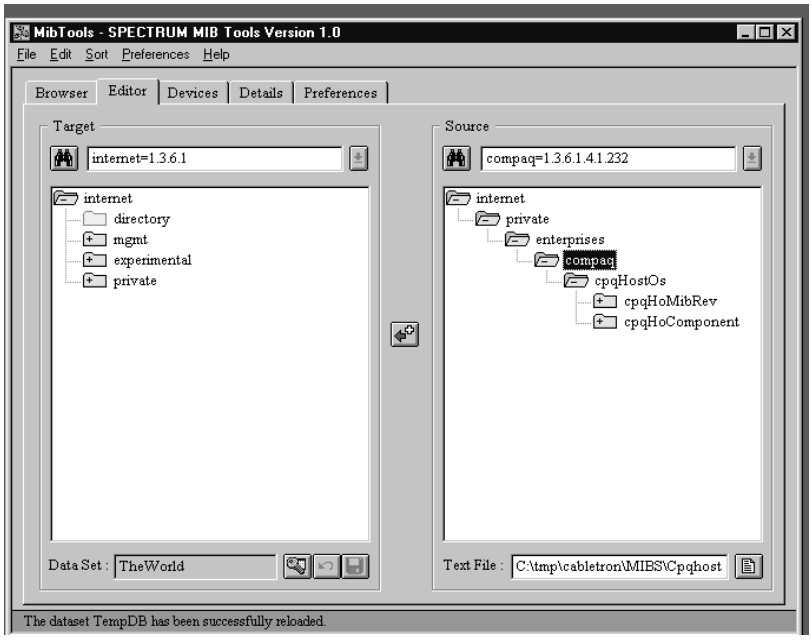

Figure 6-2. MIB Editor Screen

The MIBs must be compiled one at a time. Select the desired MIB.

The MIB Compiler pane displays as shown in Figure 6-3:

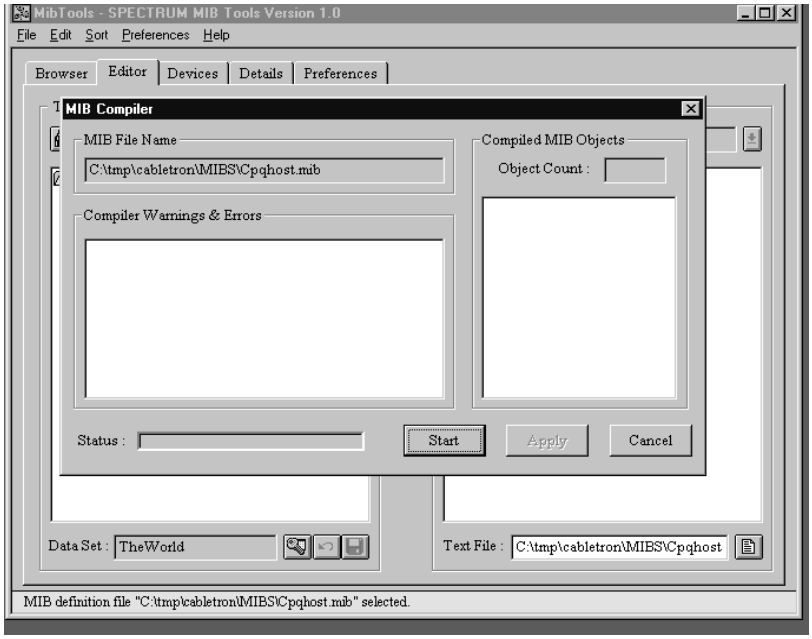

Figure 6-3. MIB Compiler Screen

The MIB filename appears in the top of the pane. Click **Start**. The MIB begins to compile. Any errors or warnings appear in the left dialog of the pane. The actual MIB names appear in the right dialog. Once the compile is complete click on the **Apply** button. This applies the MIB to a temporary database.

To merge the newly compiled MIBs into the production database, click the green arrow in the middle of the pane. This merges the two databases into one adding the Compaq MIBs into the proper tree – Internet.Private.Enterprises.Compaq.

Repeat above steps for all Compaq MIB files.

Once all the MIBs have been compiled and merged into the production database, click the Browse tab. From here ‘walk’ the MIB tree until Compaq appears as shown in Figure 6-4.

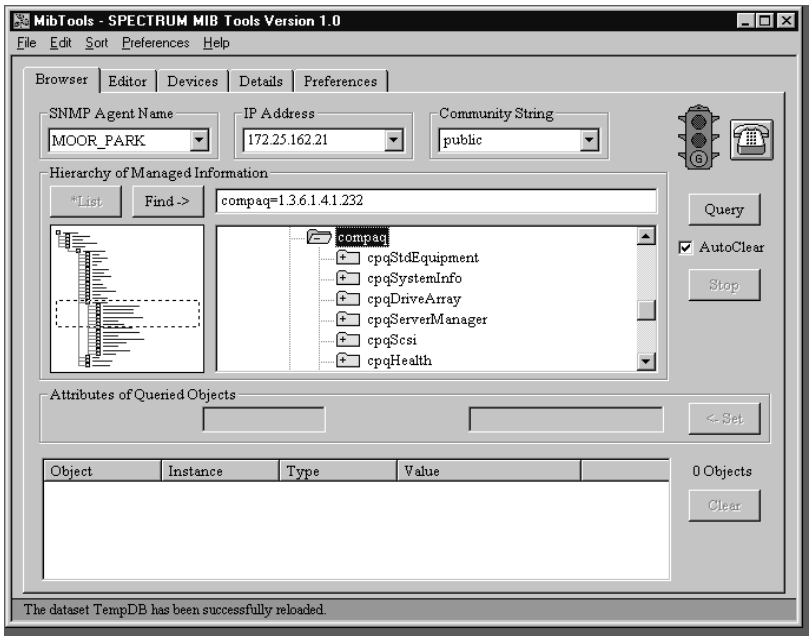

Figure 6-4. Walking the MIB tree

To view MIB variables on a particular machine, enter the appropriate machine information at the top of the pane. Go to the desired MIB. Highlight the MIB and click the **Query** button on the right side of the pane. The information appears in the bottom window of the pane, as shown in Figure 6-5.

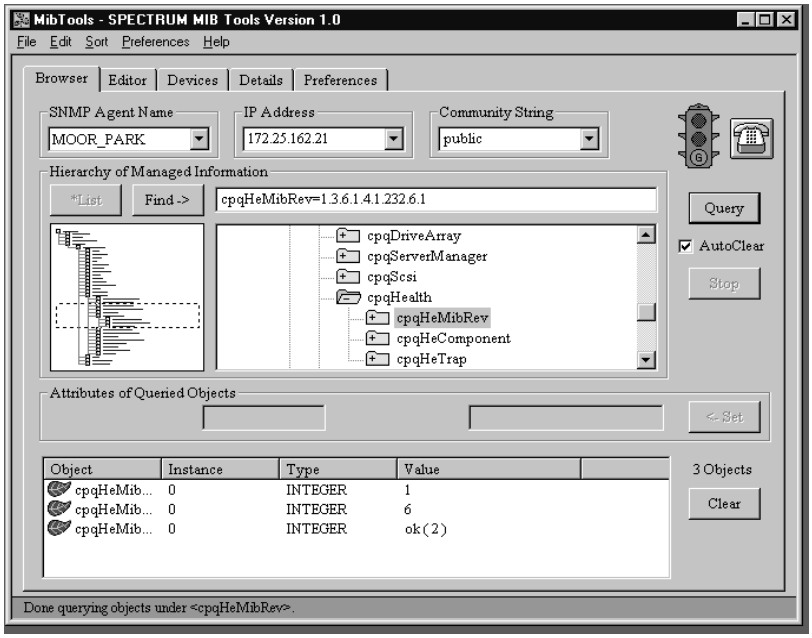

Figure 6-5. Querying a MIB

The information can be gathered from any level of the MIB. For example, if the top level (Compaq) is highlighted and the query button is clicked, all the information available from that device is retrieved.

Appendix A
Troubleshooting

Why do my Compaq Devices show up as Generic SNMP Devices after AutoDiscovery?

If the Compaq devices show up as Generic SNMP devices after installation and the running of AutoDiscovery, there are several items to check.

First verify that the Compaq devices are running the Compaq Insight Management Agents. If the Agents are not running, SPECTRUM cannot identify the device as a Compaq.

Second, make sure that the Compaq model was installed. Try to do a manual model of a Compaq device, as discussed in Chapter 6. If the Host_Compaq model is not in the list, then the extraction key provided by Cabletron did not unlock the Compaq Model. Contact Cabletron for a new extraction key.

Another possibility is a site that has several SpectroSERVERs installed but not synchronized. If multiple Spectroservers are running, all must have the Compaq Management Module installed, as discussed in chapter 5. The solution would be to sync up the SpectroSERVERs by installing the Module at each site.

Appendix B
Acquiring the Compaq Management Module

The Cabletron SPECTRUM Compaq MM is provided on the SPECTRUM CD. Keys to activate the MM can be obtained by placing a call to Cabletron at:

- North America (603)337-3500
- Europe 44-635-580000
- Germany 49-6103/991-269
- Japan 81-3-3240-1981
- Pacific 61-2-950-5900
- Singapore 65-7755355

Support of the product can be obtained through the same phone numbers

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