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COMPAQ

Integrating Compaq Insight Manager with BMC PATROL

Compaq TechNote

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Integrating Compaq Insight Manager with BMC PATROL

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Chapter 1

About This TechNote

This TechNote provides Compaq system management integration guidelines for the PATROL Management Suite, from BMC Software. This document is intended for System Administrators who have a working knowledge of PATROL and Compaq Insight Manager.

This TechNote provides the following:

- Overview of the BMC PATROL product
- Discussion of the PATROL Knowledge Module for Compaq Insight Manager (for brevity, referred to in this document as Compaq Knowledge Module, or Compaq KM) the integration module with Compaq Insight Manger.
- Installation information for the Compaq Knowledge Module.
- Tuning guide and information for the Compaq Knowledge Module.
- General troubleshooting tips and techniques for the PATROL Agent and Console.
- Product Distribution information for the Compaq Knowledge Module.

Additional Resources to Use

The following list of resources, used throughout this TechNote, provide additional information on Compaq Insight Manager and BMC PATROL.

- *Compaq Insight Manager User Guide*, P/N 133394-012

This document explains how to install, configure, and use Compaq Insight Manager.

- *BMC PATROL Documentation Set*

BMC provides an extensive library of documentation for the installation, configuration, administration, and operation of the PATROL Console, Agents, and Knowledge Modules The following documents are most likely to contain the reference information relevant to this TechNote.

  – *BMC PATROL Knowledge Module for Compaq Insight Manager*

This document provides procedures that allow the administrator to install and administer the Compaq Knowledge Module.

  – *BMC PATROL Installation*

This document provides procedures that allow the administrator to install the PATROL Console, PATROL Agents, and PATROL Knowledge Modules in an open-systems distributed environment.

  – *BMC PATROL User Guide*

This document provides procedures for administrators who are responsible for PATROL Console and Agent usage and configuration.

  – *BMC PATROL for Windows NT Installation Guide*

This document provides procedures that allow the administrator to install the PATROL Agent and PATROL Knowledge Module (KM) on a Windows NT host.

■ *BMC PATROL Knowledge Module for Windows NT Volume 1, 2, and 3 Reference Manual*

This document contains information for installing, configuring, and administering the KM for Windows NT.

■ *BMC Home Page*: http://www.bmc.com

Additional information is available through the BMC Home Page.
■ *Compaq Home Page*: http://www.compaq.com

Additional information on Compaq Insight Manager and other Compaq products is available through the Compaq Home Page.

Document Conventions

Table 1-1 lists the conventions used to distinguish elements of text found within 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
PATROL Overview

The PATROL Management Suite, from BMC Software, is an application and data management product suite designed to monitor systems, databases, and applications. PATROL uses Intelligent Autonomous Agents and loadable libraries of expertise called Knowledge Modules to automatically detect the environment, continuously survey related systems, implement recovery actions and initiate alarms based on preset parameters.

The PATROL Console is the administrator's interface with PATROL Agents. There are two types of Console modes: Developer and Operator. An Operator Console provides a graphical workspace where the administrator can monitor the status of vital resources in the distributed enterprise being managed. This is a read-only type of interface with the PATROL Agent. The Developer Console is similar to the Operator Console; however, it allows the administrator to configure and modify the Agent.

The PATROL Agent automatically looks for state changes or exceptions to normal operational thresholds that can negatively impact data availability and performance to a user. When an exception occurs, PATROL not only detects the change and issues an alert, but can automatically perform an alarm or warning recovery script without any intervention from the administrator. PATROL provides these capabilities for applications, databases, messaging, middleware, operating systems and other underlying resources.

The Agent operates autonomously on the machines being managed without needing to be connected to or communicate with the PATROL Console. The PATROL Agent:

- Collects parameter values

- Executes startup actions

- Executes predefined recovery actions when triggering conditions are met

- Generates events based on monitored parameter values

- Communicates with the PATROL Event Manager

- Processes menu commands issued from the PATROL Console

- Sends alerts to the PATROL Console

- Forwards SNMP traps to other SNMP enterprise management systems

The PATROL Agent performs PATROL activities using programmed knowledge stored in objects referred to as Knowledge Modules (KMs). These KMs are written in PATROL Script Language (PSL), configured using the PATROL Console, and then downloaded to the PATROL Agent. Only those KMs that contain relevant monitoring instructions for the machine being configured are loaded on the machine. This enables the Administrator to minimize the processing, memory, and disk requirements for the Agent with its KMs.

PATROL also has an event browser window to allow the administrator to view all the warnings and alarms that are initiated by the PATROL Agent and the programmed KMs. This event browser is referred to as the PATROL Event Manager (PEM). It can be run as a stand-alone facility or from the PATROL Console.

To complement all the operating system and application level parameters that are monitored by PATROL, hardware level component information for Compaq servers and desktops can be monitored and managed using the Compaq Knowledge Module. This KM monitors and manages a subset of the Compaq Management Information Base (MIB) variables, which are updated and maintained by the Compaq Insight Management Agents. This data is also available and accessible from the Compaq Insight Manager console. Since there are over 1,000 MIB variables, a subset of MIB variables is currently included in the Compaq KM. The following MIB categories are represented in the Compaq KM.

- Intelligent Drive Array
- SCSI System
- Server Health
- SCSI Storage System
- Network
- System Utilization
- Uninterruptible Power Supply

Each of these categories maps to an application class that appears as an icon on the main Patrol Console window once the Compaq KM is installed as shown in Figure 2-1.
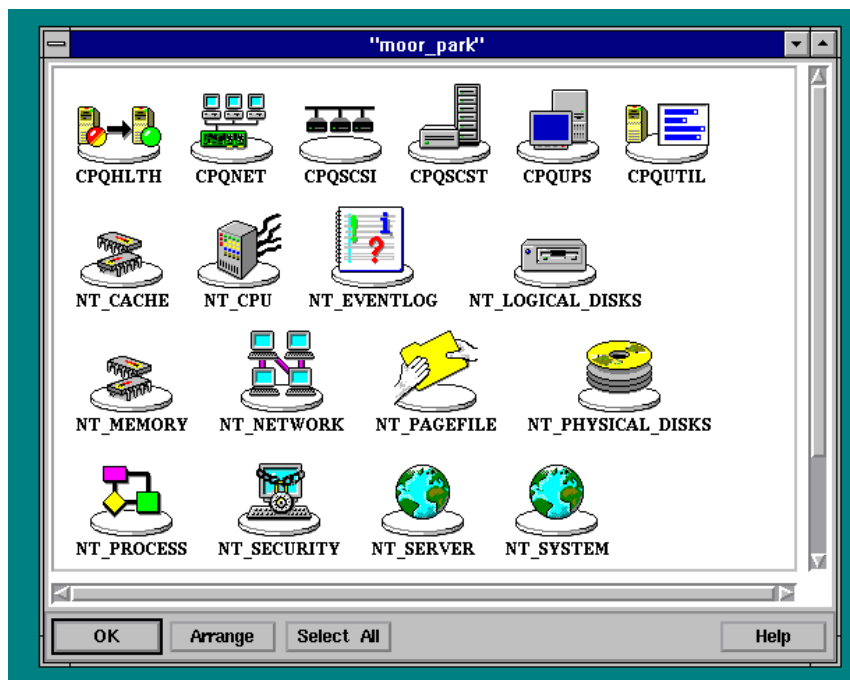
Figure 2-1. Patrol Console showing some of the Compaq Application Classes

Additional MIB variables can be added through the development of a customized KM, supplementing the vendor supplied KM. The Network variables in the KM are not taken from the Compaq MIB. They are taken from the IETF Standard general system network MIB (which is the same MIB used by Compaq Insight Manager for network variables):

Iso.org.dod.internet.mgmt.mib-2.interfaces.iftable.ifEntry

Chapter 3
Integration Feature Summary

The Compaq Knowledge Module enables the administrator to monitor the health of the Compaq server through PATROL along with database and application performance information. Consolidating this information to a centralized PATROL Console, or to a third-party console integrated with PATROL, provides the administrator with the ability to ensure that servers are highly available and tuned for optimal application performance.

To gather information on Compaq Insight Manager parameters, the PATROL Agent shares information with the Compaq Insight Management Agents. When problem situations are detected, the PATROL KM can be set up to automatically fix problem situations (when possible), or the administrator will be notified through the PATROL Console or a third-party console that a situation requires attention. For example, the Compaq KM monitors the condition of SCSI disks. An administrator will be notified through the PATROL Console or a third-party console if a disk has deteriorated and needs to be physically replaced.

By monitoring Compaq Insight Management Agents in key areas, the Compaq KM gives the user the ability to manage server fault conditions and monitor server performance.

Compaq Insight Manager components that are monitored by the Compaq KM include:

Compaq Intelligent Drive Array

■ Monitors overall condition of this controller and any associated logical drives, physical drives and array accelerators

■ Determines status of each battery pack on the board

■ Tracks number of read errors and write errors over a sample interval

■ Monitors total number of seek operations performed by the physical disk and number of times seek errors were detected

Figure 3-1 shows the Compaq Intelligent Drive Array Window and the instantiated icons representing two separate logical drives.
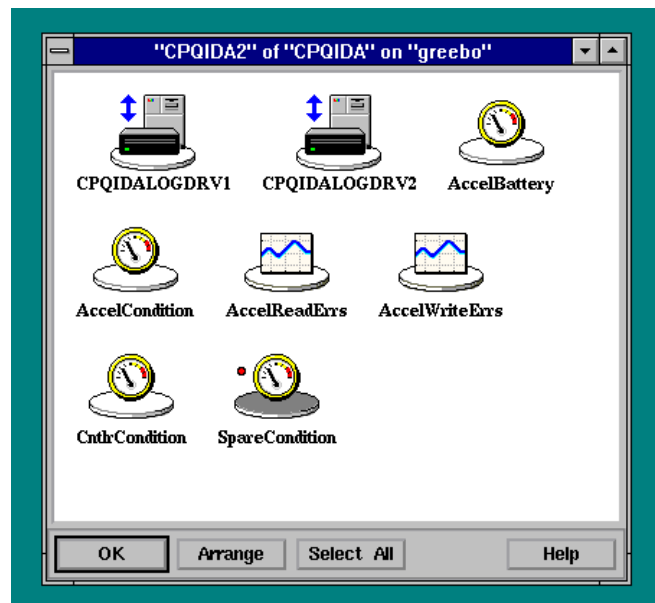
Figure 3-1. Compaq Intelligent Drive Array Parameters

Compaq SCSI System

■ Displays controller condition and all physical drives controlled by it

■ Displays the condition of the physical drives

■ Indicates the number of read and write errors on the hard drive

■ Displays Compaq tape physical drive status and tape counter errors

Figure 3-2 shows the Compaq SCSI System Windows and parameters for the SCSI controller and the SCSI drive.
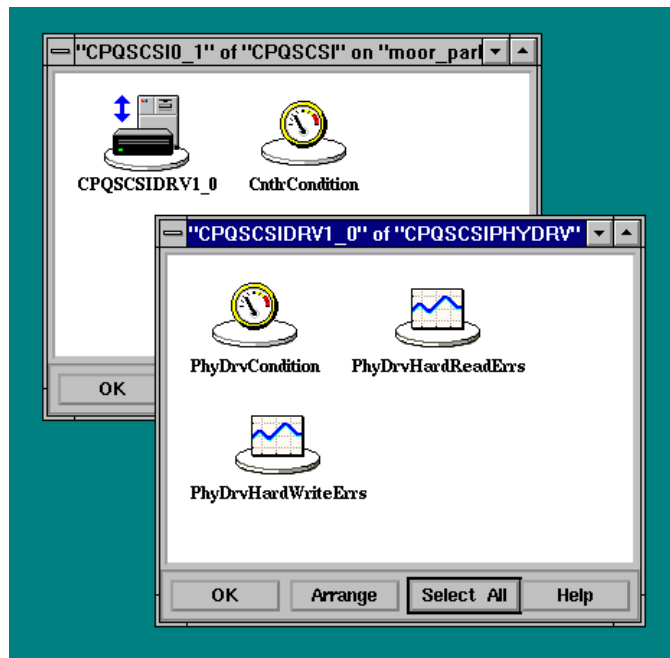
Figure 3-2. Compaq SCSI System Parameters

Compaq Server Health

- Specifies the overall condition of the critical error log, automatic server recovery, the correctable memory error log, and the POST error recording features and provides a timestamp and description of errors that occur

- Displays the overall condition of the system's thermal environment

- Monitors the system and CPU fans

Figure 3-3 shows the Compaq Health parameters.
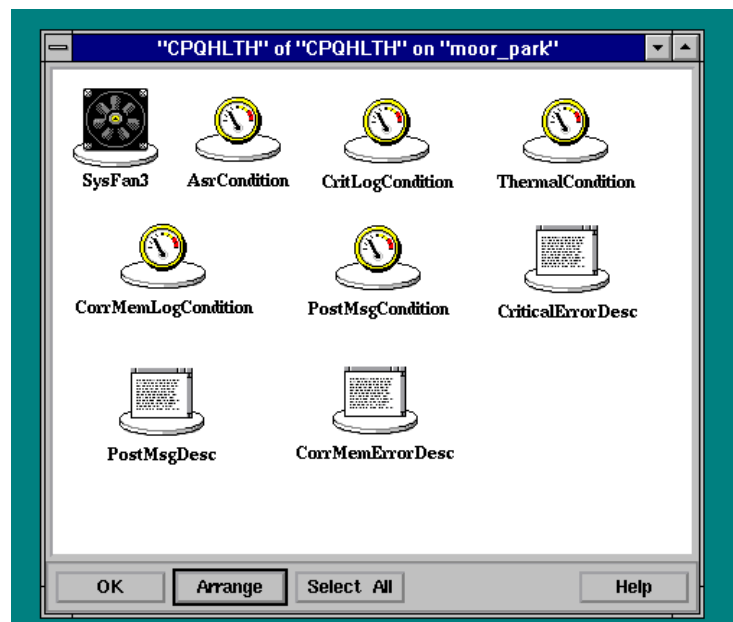
Figure 3-3. Compaq Health Parameters

Compaq ProLiant Storage System Tower

- Monitors the ProLiant Storage System Tower condition

- Monitors the ProLiant Storage System Tower fan status and panel status

- Monitors the status of the temperature of the ProLiant Storage System Tower

Figure 3-4 shows the Compaq ProLiant Storage System Tower parameters.
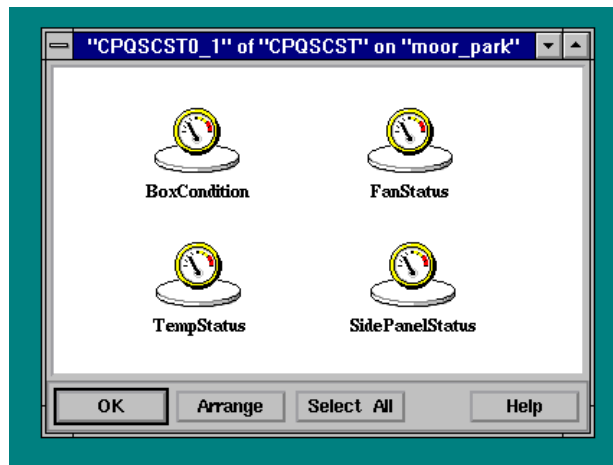
Figure 3-4. Compaq ProLiant Storage System Tower Parameters

Compaq Network

Monitors network interface statistics for each interface in the system including:

- Number of non-unicast packets delivered to a higher-layer protocol

- Number of errors over a sample period

- Total number of packets that have higher-level protocols requested to be transmitted to a non-unicast (e.g., subnetwork-broadcast or subnetwork-multicast) address, including those that were discarded or not sent

Figure 3-5 shows the Compaq Network Parameters and the instantiated icons representing two network interface controllers.
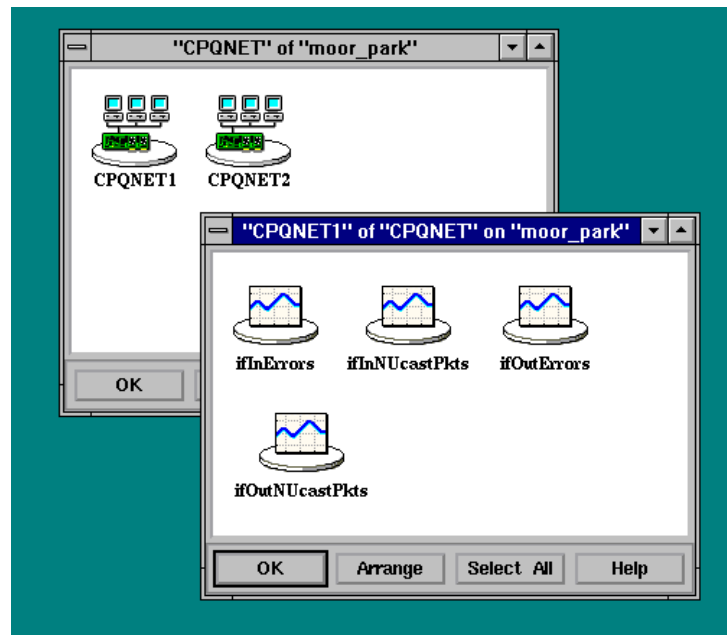
Figure 3-5. Compaq Network Parameters

Compaq System Utilization

■ Monitors CPU utilization as a percentage of the theoretical maximum

■ Monitors EISA bus utilization as a percentage of the theoretical maximum

Figure 3-6 shows the Compaq Utilization parameters and the icons representing two instantiated CPUs and the underlying CPU parameters.
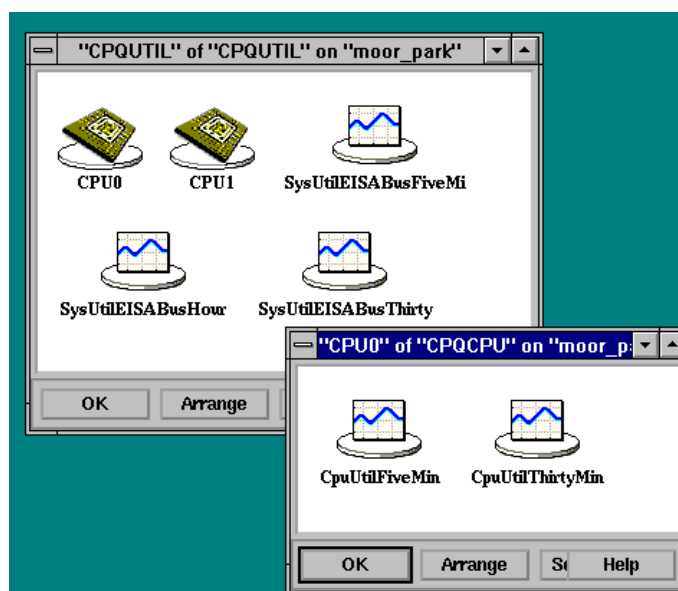
Figure 3-6. Compaq Utilization Parameters

Compaq Uninterruptible
Power Supply (UPS)

■ Displays the status of the AC line input to the UPS

■ Displays the estimated battery power (life) available

■ Displays the number of minutes of battery power remaining before the
UPS driver will begin a graceful shutdown of the OS

Figure 3-7 shows the Compaq Uninterruptible Power Supply (UPS) parameters.
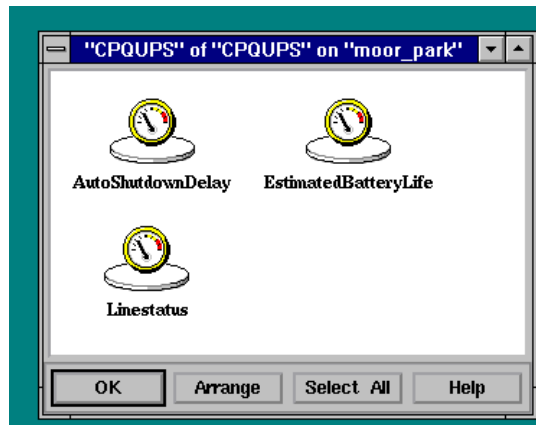
Figure 3-7. Compaq Uninterruptible Power Supply Parameters

Chapter 4
Architecture

The BMC PATROL architecture follows the manager/agent paradigm commonly seen in enterprise management tools available today. PATROL agents are intelligent and autonomous in that they can operate without being connected to the manager/console. The PATROL Agents are scalable. Depending on the monitoring requirements of the customer, modules providing the monitoring knowledge for a particular need (operating system level monitoring, database, application, etc.) are installed as add-ons to the agent. BMC refers to these modules as Knowledge Modules, or KMs. The module that provides integration with Compaq Insight Manager is available in one of these Knowledge Modules – the Compaq KM.

PATROL Architecture

PATROLView Console

Other Agents

In-House Applications

Command-line Interface

PATROL API

SNMP API

Autonomous Intelligent Agent

OS KMs (UNIX, NT, VMS)

Database KMs (Oracle, SQL Server)

Application KMs (Lotus Notes, SAP, PeopleSoft)

In-house Applications KMs (Manufacturing)

Local Repository

Node A

Node B

Help Desk Systems (Remedy, PEM Console)
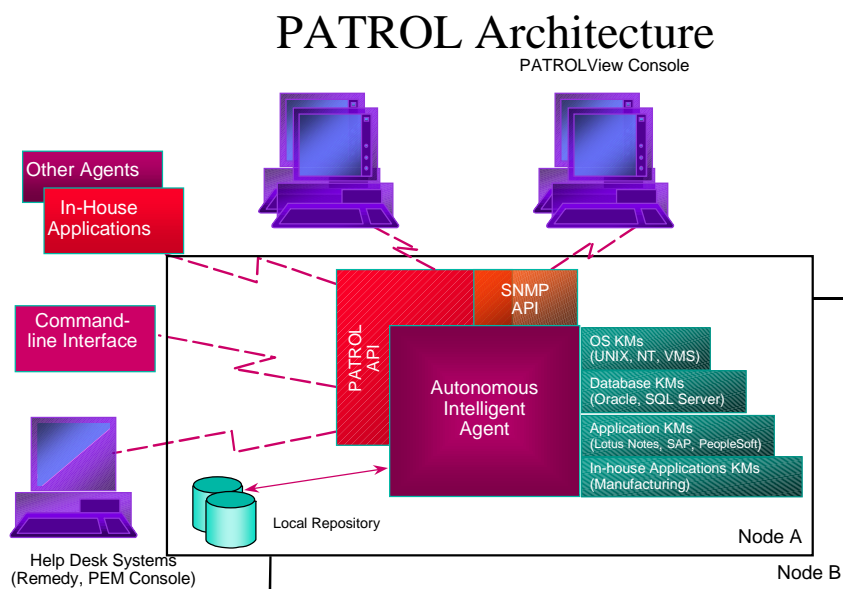
History Retention

Parameter history is stored locally on the managed machine in a proprietary PATROL format. The size of the history file is configurable. The administrator can specify the number of days of history retention for each parameter. The limit is 365 days.

History can also be stored in a remote data repository. The administrator configures the history collection parameters, the location of the remote repository, and the database of choice. This functionality is not in the basic PATROL Agent, but is available through the History Loader KM. Refer to the *BMC PATROL Documentation Set* for more information regarding the History Loader KM.

The Compaq Knowledge Module

The Compaq KM's underlying integration is at the SNMP level. The PATROL agent accesses six of the Compaq MIBs using SNMPGET commands to retrieve data on specific MIB variables that are monitored by the PATROL Agent.

The SNMPGET commands to retrieve the Compaq MIB data are processed by the native SNMP agent running on the managed machine. This SNMP agent typically runs on port 161. In addition, the PATROL agent has its own SNMP agent running on port 1161; however, the PATROL SNMP agent is not used for the Compaq Insight Manager integration and is only used for support of the BMC PATROLVIEW product.

When the Compaq KM is initiated, an application discovery process is executed. This process determines which Compaq hardware features are installed on the machine. PATROL needs this information so that it can know exactly what to monitor for and to display to the Administrator. For example, if the application discovery determines that a SCSI Tape Drive is present, then the appropriate SCSI Tape Drive parameters in the Compaq KM will monitor for the tape drive. In addition, the SCSI Tape Drive icon will be visible to the Administrator on the PATROL Console. If the SCSI Tape drive was NOT discovered, the Administrator would not see the SCSI Tape Icon on the PATROL Console.
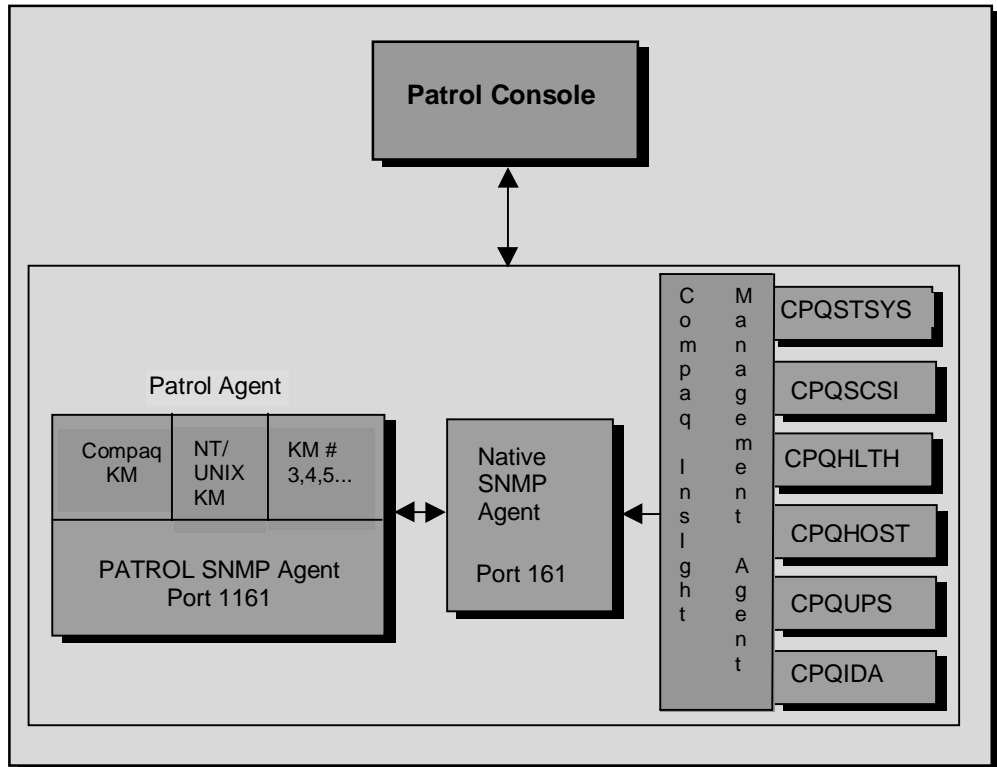
Figure 4-2. The Compaq Knowledge Module Architecture

PATROL Agent to PATROL Console Communication

Events and alarms that are detected by the PATROL agent are sent to the console as UDP datagrams immediately upon detection. Verification of the receipt of these datagrams by the console is handled at the agent application layer. If the agent determines that the console did not receive an alarm, the agent will issue a resend.

In addition to the agent sending alarms on an exception basis, the console polls the agent to determine if the agent is alive. If the agent is not alive, the console "grays out" the machine's icon on the console map, showing the connection is down.

PATROL Agent Integration with Non-PATROL Enterprise Consoles

For customer environments that have a non-PATROL enterprise console (SNMP manager), PATROL integrates with these managers by introducing a translation layer between the PATROL agent and the customer's console. The BMC module that handles this translation is the PATROL Event Translator (PET).

The PET works in different ways depending on the environment Patrol is integrating with. There is either an agent-to-agent integration (i.e. the support for HP IT/Operations), or an agent-to-console integration (i.e. the support for Cabletron Spectrum, Tivoli TME10, or Computer Associates Unicenter).

Chapter 5
Installation of the Compaq Knowledge Module

To load the Compaq KM, perform the following steps from the PATROL Console main window menu:

1. Start PATROL if it is not already running.

   The PATROL Console main window appears. For more information on starting PATROL, see the PATROL installation guide for your operating system.

2. Select **File → Load** from the menu. A list of available KMs for your site appears.

3. Select the KM for Compaq Insight Manager by selecting CPQCIMBASE.km from the list.

4. Click on **OK**.

   A popup box appears with the message, "Loading Knowledge Module, please wait...".

The Knowledge Module for Compaq Insight Manager automatically discovers any Compaq Insight Management Agent instances on machines monitored by a supported agent such as the PATROL Agent. Depending on the value of the application check cycle for a computer, PATROL might take a few moments to discover the applications and display them.

After the KM discovers the Compaq instances a refresh must be performed:

To refresh all the PATROL parameters for a KM for Compaq Insight Manager instance, do the following:

1. Using the right mouse button, click on the icon for the application instance.

   The application menu appears.

2. Select **PATROL Admin → Refresh Parameters**.

3. Optional. Double-click on the icon for each instance to verify that its parameters are active (instantiated).

The icons for all active parameters appear in the application window. Double-clicking on a parameter icon displays an exploded view of the graph, gauge, or text for the parameter.

For more information on loading KMs, see the PATROL User Guide.

Requirements

Supported Platforms

Operating Systems

- Microsoft Windows NT, version 3.51, 4.0

- SCO Unix 3.2

- SCO Enterprise Server 5.0

Compaq Hardware

All Compaq servers that support Compaq Insight Manager can support the Compaq KM.

System Requirements

- Pentium processor based system

- PATROL Console

    - 32 MB RAM (more memory may be required to run PATROL with extremely large applications)

    - 2 MB of free disk space (the amount of space that will be taken up by the PATROL for Windows NT files)

- PATROL Agent - The PATROL Agent requires 1.03 MB of hard disk space to install

■ Compaq KM - 1 MB of free disk space is required to load and run this KM.

Monitored Servers

■ SNMP agents must be installed and running on each monitored machine.

■ Compaq System Management Driver must be installed and running on each monitored machine.

■ Compaq Insight Management Agents must be installed and running on each monitored machine.

■ For full monitoring capability, the PATROL Agent 3.1 and the Agent configuration file must be installed and running on each monitored machine.

■ If you want the PATROL Agent to always start this KM, the KM distribution files must have already been extracted during the installation of PATROL and installed on the same machine as the PATROL Agent and the Agent configuration file.

Console Machine

■ PATROL Version 3.1 or later must be the management software and reside on the Console machine.

If you want to manually load this KM via the Console, the KM distribution files must have already been extracted during the installation of PATROL and must reside on the Console machine so that you can load the files during the KM setup procedure.

Chapter 6
Compaq Knowledge Module Parameters

The specific items that the Compaq KM has defined that are monitored by the PATROL agent (or any KM) are referred to as parameters. At the parameter level, the administrator can configure how they are monitored from a threshold perspective. The administrator can identify actions for the PATROL agent to perform automatically when certain thresholds are exceeded.

Global vs. Local Parameters

Parameters can be defined as either global or local. Global parameters are applicable to the entire enterprise viewed by PATROL. Local Parameters are local, or specific, to one machine. Parameters that are defined as global, are defined once by the administrator and are applied automatically to all machines discovered by PATROL.

All the parameters in the Compaq KM are global parameters.

Collector vs. Consumer Parameters

Collector parameters are parameters that collect data for use by another parameter. These parameters do not handle any parameter data display issues. Typically in PATROL, collector parameters collect (calculate, generate, etc.) data for use by another parameter referred to as a consumer parameter. A consumer parameter uses (consumes) data generated by a collector. The administrator sets thresholds against consumer parameters.

In the Compaq KM, there are both consumer and collector parameters.

Compaq Parameters

The parameters that make up the Compaq KM are all:

- global parameters
- activated by default

■   configured so that history retention is inherited

Once the PATROL agent is started, the parameters automatically begin their polling cycle. This polling cycle is completely configurable by the administrator. However, default polling cycles are set depending on the parameter.

Refer to the Appendix for more information regarding the collector and consumer parameters that comprise the Compaq KM.

Initial Configuration Steps

The initial configuration of the Compaq KM should follow the high level steps outlined in the chart below. The time invested in the up-front analysis will greatly ease the implementation – a common oversight in the deployment.

Table 6-1
Initial Implementation of the Compaq Knowledge Module

Step	Description
1. Identify Parameters	Identify those parameters that are needed and those that are not needed.
2. Identify Thresholds	Determine the warning and alarm thresholds for those parameters identified in Step 1. Default values for most of the parameters in the Compaq KM will probably be sufficient since they are enumerated values. The thresholds for scalar parameters should be verified.
3. Deactivate Parameters	Deactivate the unnecessary parameters defined in Step 1.
4. Configure Thresholds	Modify default parameter values that do not meet monitoring needs.

Deactivating Parameters

The Compaq KM comes with all the parameters active (turned on). Not all of the parameters are relevant to every operations environment. It is necessary to deactivate those parameters that are not requisite parameters to the environment. If it is uncertain which parameters are needed, try having the parameters initially turned off and then activated one-by-one. A common mistake is to have all the parameters turned on, resulting in the PATROL console being flooded with unnecessary alarms. The administrator is then in a fire-fighting mode, turning off alarms to relieve the alarm traffic.

Configure Thresholds

The initial defaults of the Compaq KM parameters are listed in the Appendix. The majority of these parameters have enumerated values between 0 and 4. The initial defaults, therefore, are relatively straightforward. A value of 3 indicates a warning and a value of 4 indicates an alarm. The default values for the Compaq KM parameters are a reasonable starting point for establishing the warning and alarm thresholds.

For other Knowledge Modules, such as the base NT or UNIX KMs, the default thresholds are more likely to require some investigation to determine if the defaults are relevant to the administrator's needs. A critical success factor to the deployment of PATROL is that the thresholds for parameters are accurate. This will require significant up-front time to determine and quantify each managed machine's monitoring requirements. This up-front analysis is not exclusively a PATROL requirement, but the requirement of any management tool, if it is to be configured accurately.

Chapter 7
Trouble Shooting the BMC PATROL Agent

This chapter outlines several troubleshooting techniques that can be used to diagnose a problem when a connection between the PATROL console and the PATROL agent is down.

Console Indicators

When a connection between the PATROL agent and the PATROL console is down or can not be established, the icon for the machine on the PATROL console will be grayed out. There are several things the administrator can do to fix this problem depending on what initially caused the problem.

Initial Troubleshooting

1. **Update the Connection** – First the administrator should try to update the connection between the agent and the console. From the main PATROL Console, depress the right mouse button on the grayed out icon to display a menu. From this menu, select **Update Connection**. Many times, this will restore the connection.

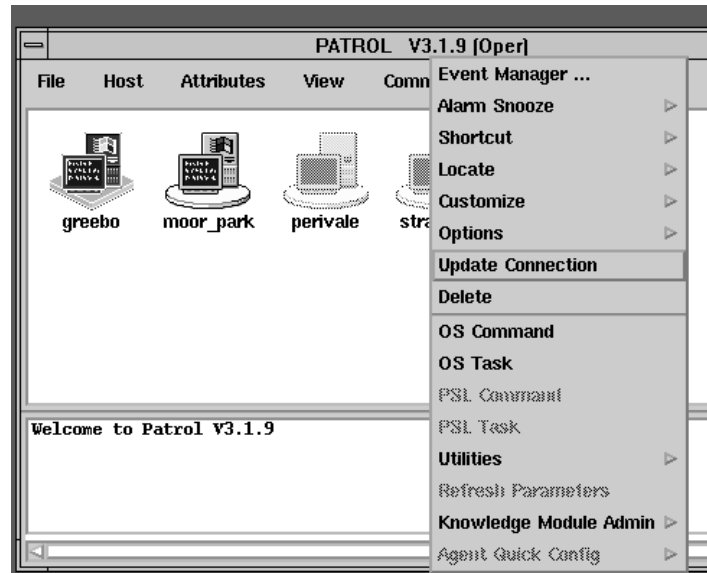**Figure 7-1.** PATROL Console main window

2. **View the Console Window** – If updating the connection does not fix the problem, sometimes an indication of the problem is available on the machine's console window on the main PATROL Console.

3. **Verify Network Connectivity** – Verify network connectivity from the console machine to the agent machine. Pinging the system can verify that the network is up.

Restarting the PATROL Agent

After initial troubleshooting, the administrator should verify that the PATROL Agent is running and restart the agent if necessary.

1. **Verify** the **Agent is Running** – Verify that the PATROL agent is up and running.

    a. **NT Environment** - For a Windows NT machine, the PATROLAgentService entry under Control Panel Services should have a status of *started.*

    b. **Unix Environment** - For a Unix machine, a simple "ps –ef", searching for PATROLAgent will indicate if the PATROL Agent is running.

2. **Restart the PATROL Agent** – If the PATROL Agent is not up and running, it needs to be restarted.

    a. **NT Environment** – In the Control Panel Services, select start for the agent process, PATROLAgentService.

    b. **Unix Environment** – Start the PATROL Agent located in the PATROL Home directory, "*/PATROLAgent*".

3. **Verify the License File** – If the PATROL Agent can not be started after trying the steps above, the administrator should verify the License file for the agent is correct and up to date. The license file is located in the *lib* directory under the PATROL home directory. For more information, refer to the *PATROL Installation Guide,* section titled *Configuring, Starting, and Setting Up PATROL.*

4. **Verify Port Number** – The default port number for the PATROL Agent is 1987. Verify that no other process is using this port. If port 1987 is used by another process, the administrator can configure the agent to run on a different port. This is done using the "-p" option during agent startup. he port number must also be updated on the console side if the agent uses something other than 1987.

5. **Corrupted History File –** The history file can become corrupted if the agent is abnormally terminated. Removing the history files and restarting the agent will correct the problem if the files were corrupted. The PATROL history files are located in the *"/log/history/hostname/portnumber"* directory under the PATROL home directory, where *hostname* and *portnumber* refer to the specific configuration.

Reconnecting the Agent and Console

Once the administrator has verified that the PATROL Agent is running, but is still having difficulty establishing a connection between the agent and the console, the administrator should check the following points (these points are listed in order of the most likely resolution to least likely resolution):

1. **Verify Number of Developer Consoles** – If the administrator is trying to establish connection in developer mode, he/she should verify that there is no other connection in progress by another console in developer mode. There can only be one developer session at any one point in time.

2. **Verify User ID and Password** - Verify the PATROL Console has the correct user ID and password by depressing the right mouse button on the machine icon from the main PATROL Console window, and selecting Customize → **Userid/Password**. This is a common problem for environments that utilize password aging.

3. **Verify Access Control List –** Verify on the agent machine that the access control list is not restricting the console from establishing the connection. Use the pconfig command on the agent machine to verify this information.

4. **Verify Error Logs** – Verify PATROL Console error logs located in *"/PATROL/tmp"* directory under the user home directory on the console. A secondary error log is located in the log directory under the PATROL Home directory.

Chapter 8
Management Solution Scenarios

This chapter provides several scenarios to illustrate how Compaq Insight Manager and the Compaq Knowledge Module work together. The following four solution scenarios are discussed in this chapter:

■ Using the IDA parameters in the Compaq KM in conjunction with the logical disk parameters in the NT KM.

■ Using the Physical Drive Parameters in the Compaq KM in conjunction with the Physical Drive Parameters in the NT KM.

■ Using the CPU utilization parameters in the Compaq KM in conjunction with the CPU parameters in the NT KM.

■ Making global alarm threshold changes to the parameters in the Compaq KM.

These scenarios for NT systems are only suggestions on how to use Compaq Insight Manager and the Compaq KM. There are many other ways the two can be used together. Although not discussed, scenarios for UNIX are similar in scope. For more information, refer to the documentation for the Compaq Insight Manager and BMC PATROL KM for Compaq Insight Manager listed in Chapter 1 of this TechNote.

How do I use the IDA parameters in the Compaq KM in conjunction with the logical disk parameters in the NT KM?

The NT KM contains an application called *NT_Logical_Disks*. This application contains parameters specific to each of the logical drives in the system. There is no breakdown of information down to the physical drives that comprise the logical drives.

When the Compaq KM is loaded, additional logical drive related parameters exist under the application named *CPQIDA*. For each of the logical drives, there is additional information provided down to the physical drives making up the each of the logical drives.

When the Compaq KM is first installed, the administrator finds what might appear to be potential redundancy between the parameters in the NT KM and the Compaq KM. However, the parameters provided by the Compaq KM complement the information in the NT KM. There is no redundancy of information. Depending on specific customer needs, the administrator could potentially use all the parameters in both the KMs.

NT KM Logical Disk Parameters

There are four logical disk parameters in the NT KM. Two are oriented for logical disk space usage, and two are more focused on performance. These parameters are generally activated and monitored by the administrator. The addition of the Compaq KM should not impact their usage. The administrator should continue to use these parameters without any configuration changes due to the addition of the Compaq KM.

Table 8-1

NT Logical Disk Parameters

Parameter Name	Description
LdldDiskQueueLength	Disk Queue Length
LDldDiskTimePercent	Disk Request Service Time
LdldFreeMegabytes	Free Megabytes
LDldFreeSpacePercent	Free Space Percentage

For more information regarding these parameters, refer to the BMC document *PATROL Knowledge Module for Windows NT Volume 2, Reference Manual.*

Compaq KM Logical Disk Parameters

The *CPQIDA* application in the Compaq KM, shown in Figure 8-1, contains all the parameters concerning the logical disks. The parameters are instantiated for the number of logical disks present in the system being monitored.

Where the NT KM parameters for logical disks show more of the performance and usage of the disks, the Compaq KM, in general, provides information regarding the health of the disks. To get an accurate perspective on the logical disks, the logical disk parameters in the Compaq KM must be used in conjunction with the parameters in the NT KM. The information provided by the Compaq KM logical disk parameters is a critical piece in providing a complete view of the status of the logical drives.

The *CPQIDA* application in the Compaq KM, shown in Figure 8-1, contains all the parameters concerning the logical disks. The parameters are instantiated for the number of logical disks present in the system being monitored.
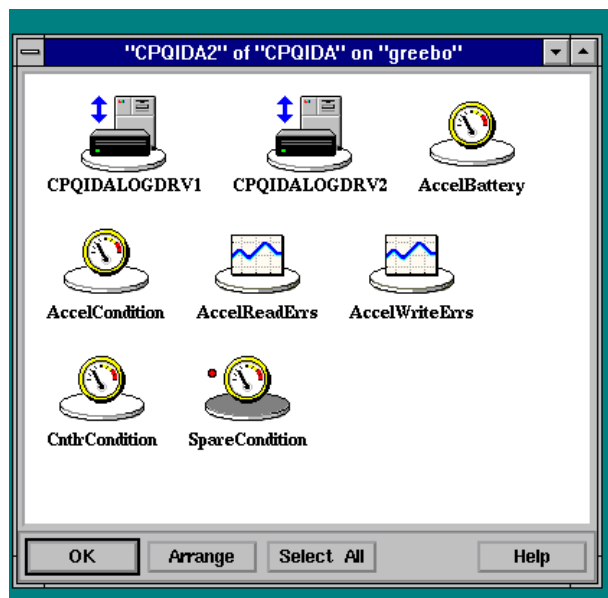

Figure 8-1. Compaq Intelligent Drive Array Parameters

The administrator can drill down through the logical drive classes to reveal the physical disks making up the logical drives. The physical drive numbers are appended to the instantiated name of the physical drive parameter (i.e. *CPQIDAPHYDRV5*). All the IDA physical drive parameters are located under the logical drive parameters in the Compaq KM. Physical drive parameters for SCSI drives can be found under the *CPQSCSI* application.

Due to the way the physical drive parameters are nested below their respective logical drive parameters, there is an implicit correlation between these parameters. Administrators will find this useful when a fault occurs; events are reported at the lowest level and percolated up to the logical drive class icon and then up to the general *CPQIDA* application class icon. Table 8-2 shows the hierarchy of the three class levels in the *CPQIDA* application class. The low-level parameters for each of these classes can be referenced in the Appendix.

Table 8-2

CPQIDA Class Hierarchy

Class Name	Level	Description
CPQIDA	1 (Top)	IDA Application Class Name
CPQIDALOGDRV[1, 2, 3, …]	2	Class Name for each instantiated logical drive
CPQIDAPHYDRV[1, 2, 3, …]	3	Class Name for each instantiated physical drive

As an example, if an alarm occurs concerning a high number of hard read errors on a physical drive (a parameter under the physical drive class), not only will the associated parameter icon display the alarm condition, but the icon for the logical drive containing that physical drive will reflect the alarm condition.

The administrator should keep the *LogDrvCondition* parameter active to show the state of the logical drive. This gives a more complete picture of the logical drive than just the condition of the physical drives making up the logical drive. The states of the logical drive are reflected in this parameter such as rebuilding or recovering (as the result of a failed physical drive).

How do I use the physical drive parameters in the Compaq KM in conjunction with the physical drive parameters in the NT KM?

There are only two physical disk related parameters in the NT KM. These are located under the application class *NT_PHYSICAL_DISKS*.

When the Compaq KM is loaded, there are several additional parameters related to physical disks that will be very useful to the administrator. These parameters are located in two different application classes in the Compaq KM. For IDA configurations, the physical disk parameters are located under the application class *CPQIDA*, under the logical disk drive class. For SCSI drives, the physical drive parameters are under the application class *CPQSCSI*.

NT KM Physical Drive Parameters

The application class *NT_PHYSICAL_DISKS* contains the physical disk parameters for the NT KM. Table 8-3 lists these parameters.

Table 8-3

NT KM Physical Disk Parameters

Parameter Name	Description
PdpdDiskQueueLength	Number of requests in the queue
PdpdDiskTimePercent	Percent of time disk spends servicing reads and writes

The addition of the Compaq KM should not impact their usage. The administrator should continue to use these parameters without any configuration changes due to the addition of the Compaq KM.

For more information regarding these parameters, refer to the BMC document *PATROL Knowledge Module for Windows NT Volume 2, Reference Manual.*

IDA Physical Drive Parameters

The physical drive parameters for IDA are located under the associated logical drive application class under *CPQIDA*. These parameters focus on the physical read, write, and seek errors for the physical drives, as shown in Figure 8-2. There are also parameters for three functional test results associated with the drive performance. For more information regarding these parameters, refer to the Appendix.
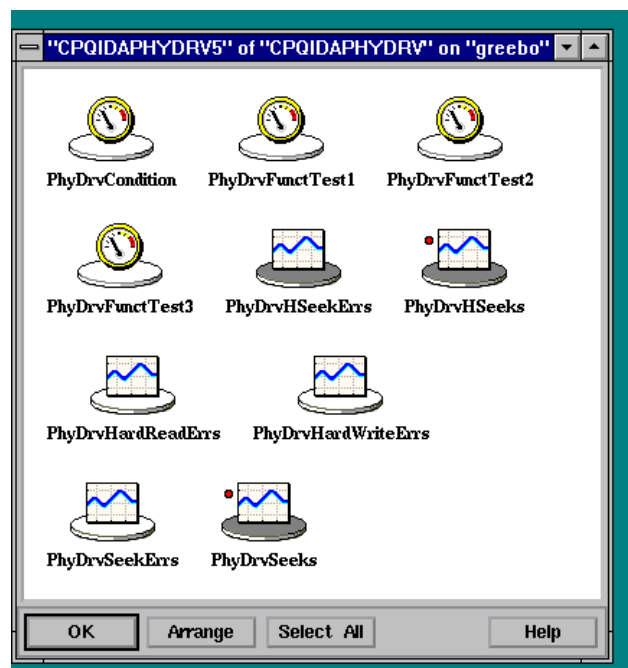

Figure 8-2. Compaq IDA Physical Drive Parameters

Establishing Thresholds

The information provided from these parameters pertains to the physical health and stability of the drives. This information complements the parameters provided in the NT KM and does not replace the NT KM parameters.

Note: Since the information provided regarding the number of read, write, and seek errors is scalar, the administrator needs to first determine what values are appropriate for establishing the warning and alarms thresholds.

Using the default values provided by PATROL for these parameters is not recommended. (Refer to the Appendix for these values.) They generate warnings on the first error and alarms on the second error, therefore parameters should be set according to the individual machine and environment.

Seek Parameter Differences

It may be difficult to distinguish when each of the four IDA physical drive parameters should be used. The PATROL implementation of these parameters is not a straight forward implementation of the information contained in the Compaq Insight Manager MIBs.

The counters for the seeks and seek errors are represented by a total of 8 bytes (64 bits) within the Compaq MIB. The PATROL parameters currently don't interpret the entire 64 bit counter as one parameter; instead they split the counter into the low 32 bits and the high 32 bits. This requires the administrator to manually interpret these two parameters to get the actual seek and seek error counts. The PATROL documentation is not clear on this difference.

SCSI Physical Drive Parameters

The Compaq KM parameters for SCSI physical drives report on the read and write errors associated with the drive, as shown in Figure 8-3. There are also parameters for reporting on the overall physical drive condition and the controller condition.
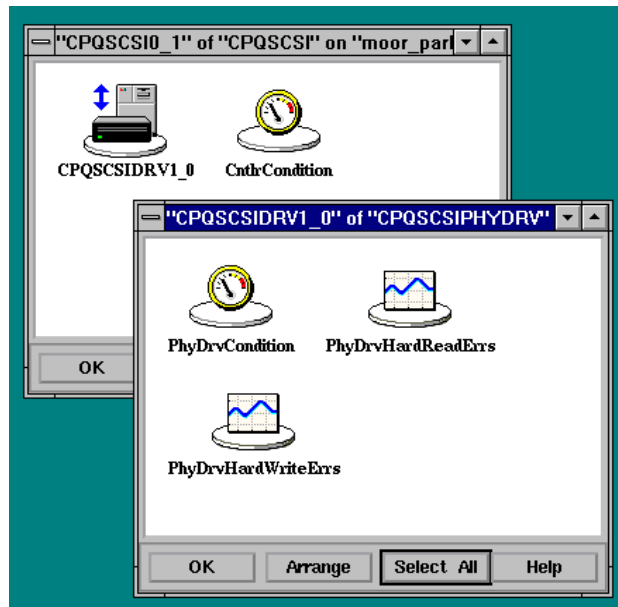

Figure 8-3. Compaq SCSI Controller and Drive Parameters

Table 8-4 outlines these parameters.

Table 8-4

Compaq KM SCSI Physical Disk Parameters

Parameter Name	Description
PhyDrvCondition	Overall SCSI drive condition
PhyDrvHardReadErrors	Number of hard read errors on the SCSI drive
PhyDrvHardWriteErrors	Number of hard write errors on the SCSI drive
CntlrCondition	Overall SCSI Drive Controller Condition

The parameters for the ProLiant Storage System Tower are associated with the SCSI physical disk parameters. These are located under the *CPQSCST* application class. These parameters provide information regarding the physical attributes associated with the tower itself. Table 8-5 lists these parameters.

Table 8-5

Compaq KM ProLiant Storage System Tower Parameters

Parameter Name	Description
BoxCondition	Overall ProLiant Storage System Tower Condition
FanStatus	Status of the ProLiant Storage System Tower Fan Status
SidePanelStatus	Status of the removable side panel on the ProLiant Storage System Tower
TempStatus	Status of the temperature of the ProLiant Storage System Tower

The administrator should monitor the BoxCondition, FanStatus, and TempStatus parameters. The SidePanelStatus parameter would only be of importance if access to the ProLiant Storage System Tower needed to be restricted to authorized personnel.

How do I use the CPU utilization parameters in the Compaq KM in conjunction with the CPU parameters in the NT KM?

The NT KM contains an application class called *NT_CPU*. This application contains parameters that provide CPU utilization information broken down by user and system time. The Compaq KM has an application class called *CPQUTIL* that contains CPU utilization parameters that complement the parameters in the NT KM.

NT KM CPU parameters

The NT KM has four CPU related parameters as listed in Table 8-6.

Table 8-6

NT KM CPU Parameters

Parameter Name	Description
CPUprcrUserTimePercent	Percentage of time CPU spends on user tasks
CPUprcrProcessorTimePercent	Percentage of time CPU spends on system tasks
CPUprcrInterruptsPerSec	Number of CPU interrupts per second
CPUprcrPrivTimePercent	Percentage of time CPU spends on privileged tasks

The addition of the Compaq KM should not impact their usage. However, some administrators may find the information provided in the CPU parameters of the Compaq KM more useful, as discussed below.

For more information regarding these parameters, refer to the BMC document *PATROL Knowledge Module for Windows NT Volume 2, Reference Manual.*

Compaq KM CPU parameters

The Compaq KM has two CPU related parameters that complement the CPU parameters in the NT KM. Refer to Table 8-7 and Figure 8-4.

Table 8-7

Compaq KM CPU Parameters

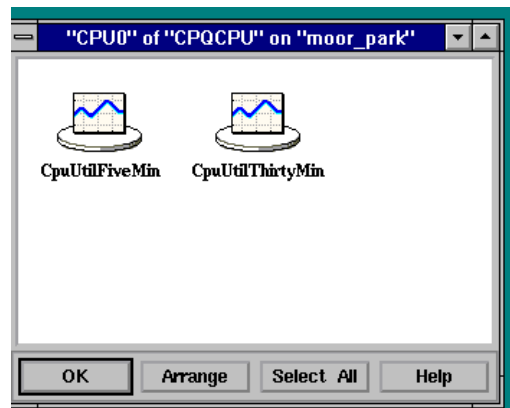| Parameter Name	Description
CpuUtilFiveMin	Average CPU utilization taken in 5 minute intervals
CpuUtilThirty	Average CPU utilization taken in 30 minute intervals

Figure 8-4. Compaq CPU Utilization parameters

Masking out CPU Spikes

Since the NT KM has the current CPU utilization, these averaged figures over five and thirty minutes provide the administrator with a different view of the utilization. Using these parameters masks out CPU utilization "spikes" that the CPU parameters under the NT KM would pick up.

Many times, short-lived application start-ups push the CPU utilization to 100% while systems are initialized, networks are discovered, and databases are brought on-line. This 100% utilization is normal and expected in many cases. The use of the averaged CPU time over five minutes and thirty minutes gives the administrator a more accurate reflection of the CPU utilization for the system.

Bus Utilization

In addition to the CPU parameters in the *CPQUTIL* application class, there are also EISA bus utilization parameters, as shown in Figure 8-5. Similar to the CPU utilization, these parameters give five, thirty, and sixty minute averaged utilization figures.

At this time, the Compaq KM does not provide any parameters for monitoring any of the available PCI bus utilization information currently contained in the Compaq Insight Manager MIBs.
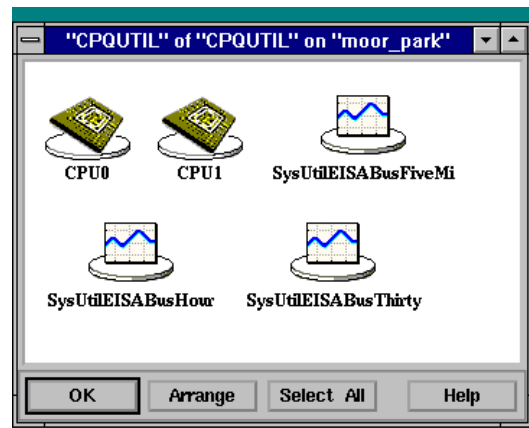
Figure 8-5. Compaq EISA Bus Utilization Parameters

How do I make global alarm threshold changes to the parameters in the Compaq KM?

One of the most significant features of PATROL is the ability to globally define agent monitoring policies. Administrators need to structure their PATROL environment to take advantage of the logical groupings of machines so that they can maximize the benefits of global parameter definitions.

When an administrator needs to establish an alarm threshold (or any parameter configuration change) to multiple machines, the change can be made to the global definition of the parameter, and then applied to the logical grouping of machines. Use the following steps to accomplish this global change:

1• Start the BMC PATROL console manager. Be sure to specify developer mode. For the Console ID field, enter in a Console ID that will not automatically load unexpected Knowledge Modules. Once the PATROL log-on window appears, log-on to display the main PATROL window.

   Note: Once completely logged into PATROL and at the main PATROL window, always verify the Knowledge Modules that are loaded are what were intended.

2• If the Console ID selected in Step 1 above does not load any Knowledge Modules, be sure to load the *cpqcimbase.km* for the Compaq KM files by selecting **File** → **Load KM**. In addition, a Knowledge Module must be added to support the machine types being used. For example, if NT machines are being used, then load the *nt.km* Knowledge Module.

3• List the Application Classes by selecting **Attributes** → **Application Classes**, then select the class to modify. As an example, select CPQCPU for the Compaq CPU application.

4• Display the parameters for the chosen application class by selecting **Attributes** → **Parameters**, then select and modify the specific parameters as desired.

5• Once the global parameter window is displayed, edit the parameter as desired. If for example, the parameter *CpuUtilFiveMin* was the parameter selected, the screen titled *"CpuUtilFiveMin" global for "CPQCPU" class* is displayed as shown in Figure 8-6.
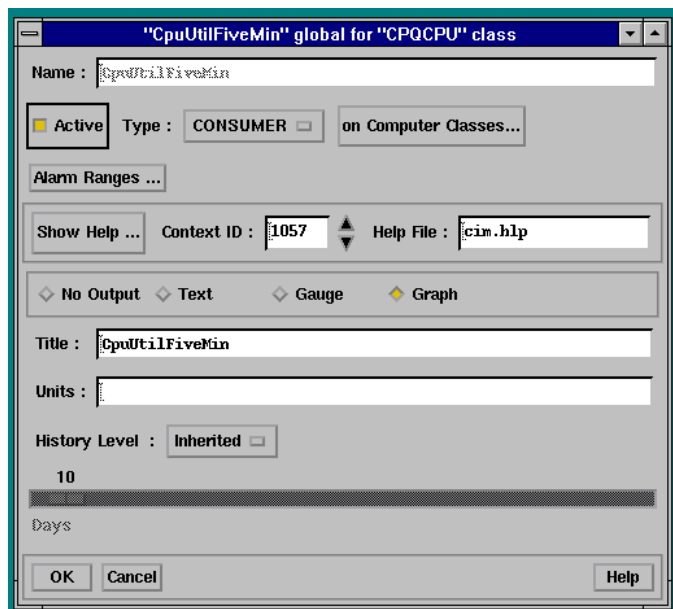

Figure 8-6. Window for making global parameter changes

6• When all modifications have been made to the parameters on this window, click **OK** and return to the main PATROL Console Window.

7• The updated Knowledge Module must now be distributed to the desired Compaq Servers. First, select the servers to update, then distribute the updated KM by selecting **File → Commit KM to Selected Hosts**.

8• A series of dialog boxes is displayed as distribution of the updated Knowledge Module is completed. The process ends with a final dialog box that shows the distribution is complete.

Chapter 9
Acquiring the Compaq
Knowledge Module

The Compaq KM may be obtained in the U.S. by placing a call to BMC (1-800-537-1813). After purchase BMC will provide an ftp site where the KM can be retrieved.

For ordering outside the U.S., contact your BMC account representative.

The KM can also be obtained through BMC's home page http://www.bmc.com. Fill out a profile form and send it in. BMC will then call for purchase information.

Appendix
Compaq Knowledge
Module Parameters

The following tables outline the collector and consumer parameters that
comprise the Compaq Insight Manager KM.

The following table outlines all the collector parameters for the Compaq Insight
Manager KM:

Parameter Name	Polling Schedule	Collection Source	# of Associated Consumer Parms	Status
HLTHColl	10 minutes	CIM Agent	9	Active
IDAColl	10 minutes	CIM Agent	15	Active
NETColl	10 minutes	CIM Agent	3	Active
SCSIColl	10 minutes	CIM Agent	4	Active
SCSTColl	10 minutes	CIM Agent	4	Active
UPSColl	10 minutes	CIM Agent	3	Active
UTILIZATIONColl	1 minute	CIM Agent	5	Active

The following table outlines all the consumer parameters for the Compaq Insight Manager KM:

Application Class CPQHLTH:

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
AsrCondition Overall condition of the Automatic Server Recovery feature	Gauge	3	4	10 minutes	HLTHColl	1=other 2=OK 3=Degraded 4=Failed
CriticalErrorDesc Text description of the critical error.	Text	N/A	N/A	10 minutes	HLTHColl	N/A
CritLogCondition Overall condition of the critical error log feature.	Gauge	3	4	10 minutes	HLTHColl	1=other 2=OK 3=Degraded 4=Failed
PostMsgCondition Overall condition of the Post error recording feature.	Gauge	3	4	10 minutes	HLTHColl	1=other 2=OK 3=Degraded 4=Failed
PostMsgDesc Description of the Post error.	Text	N/A	N/A	10 minutes	HLTHColl	N/A
CorrMemErrorDesc Text description of the memory error.	Text	N/A	N/A	10 minutes	HLTHColl	N/A
CorrMemLogCondition Overall condition of the correctable memory error log feature.	Gauge	3	4	10 minutes	HLTHColl	1=other 2=OK 3=Degraded 4=Failed
ThermalCondition Overall condition of the system's thermal environment.	Gauge	3	4	10 minutes	HLTHColl	1=other 2=OK 3=Degraded 4=Failed

Application Class CPQFAN:

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
ThermalFanStatus Indicates if the primary system fan is operating properly.	Gauge	N/A	4	10 minutes	HLTHColl	1=other 2=OK 3=n/a 4=Failed

Application Class CPQIDA:

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
AccelBattery Status of each battery pack on the board.	Gauge	4	5	10 minutes	IDAColl	1=other 2=OK 3=Recharging 4=Degraded 5=Failed
AccelCondition Overall condition of the SMART array accelerator.	Gauge	3	4	10 minutes	IDAColl	1=other 2=OK 3=Degraded 4=Failed
AccelReadErrs Number of accelerator read errors during the number of hours defined in Service Hours[1].	Graph	1	2 to 100	10 minutes	IDAColl	N/A
AccelWriteErrs Number of accelerator write errors during the number of hours defined in Service Hours[1].	Graph	1	2 to 100	10 minutes	IDAColl	N/A

continued

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[1] "Service Hours" is defined in Compaq Insight Manager for both SMART and SCSI drive types. The number of service hours can be verified on the Compaq Insight Manager SMART and SCSI Physical Drive Windows. For further information on Service Hours, use the Compaq Online User's Guide (available on the Compaq Management CD), or use the Help option within Compaq Insight Manager.

Application Class CPQIDA continued

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
CntlrCondition Overall condition of the SMART array controller and associated logical drives, physical drives, and array accelerators.	Gauge	3	4	10 minutes	IDAColl	1=other 2=OK 3=Degraded 4=Failed
SpareCondition Overall condition of the spare.	Gauge	3	4	10 minutes	IDAColl	1=other 2=OK 3=Degraded 4=Failed

Application Class CPQIDALOGDRV:

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
LogDrvCondition Overall condition of the logical drive and associated physical drives.	Gauge	3	4	10 minutes	IDAColl	1=other 2=OK 3=Degraded 4=Failed

Application Class CPQIDAPHYDRV:

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
PhyDrvCondition Overall condition of the physical drive.	Gauge	3	4	10 minutes	IDAColl	1=other 2=OK 3=Degraded 4=Failed
PhyDrvFunctTest1 Comparison of current average track to track seek times to when the drive was new.	Gauge	N/A	0 to 80	10 minutes	IDAColl	N/A

continued

Application Class CPQIDAPHYDRV continued
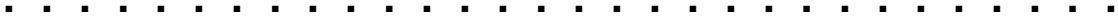
Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
PhyDrvFunctTest2 Comparison of current 1/3 stroke seek times to when the drive was new.	Gauge	N/A	0 to 80	10 minutes	IDAColl	N/A
PhyDrvFunctTest3 Comparison of current full stroke seek times to when the drive was new.	Gauge	N/A	0 to 80	10 minutes	IDAColl	N/A
PhyDrvHardReadErrs Number of physical hard drive read errors during the number of hours defined in Service Hours[1].	Graph	1	2 to 100	10 minutes	IDAColl	N/A
PhyDrvHardWriteErrs Number of physical hard drive write errors during the number of hours defined in Service Hours[1].	Graph	1	2 to 100	10 minutes	IDAColl	N/A
PhyDrvHSeekErrs Number of times the physical drive detects a seek error (using the high 32 bits of the counter) during the number of hours defined in Service Hours[1].	Graph	1	2 to 100	10 minutes	IDAColl	N/A
PhyDrvSeekErrs Number of times the physical drive detects a seek error (using the low 32 bits of the counter) during the number of hours defined in Service Hours[1].	Graph	1	2 to 100	10 minutes	IDAColl	N/A

[1] See Footnote, Page A-3.

Application Class CPQIDAPHYDRV continued

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
PhyDrvHSeeks Number of seeks (using the high 32 bits of the counter) during the number of hours defined in Service Hours[1].	Graph	1	2 to 100	10 minutes	IDAColl	N/A
PhyDrvSeeks Number of seeks (using the low 32s of the counter) during the number of hours defined in Service Hours[1].	Graph	1	2 to 100	10 minutes	IDAColl	N/A

Application Class CPQNET:

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
ifInErrors Number of packets discarded by the driver after they were received due to errors.	Graph	1	2 to 100	1 minute	NETColl	N/A
ifInNUcastPkts Number of non-unicast (subnetwork-broadcast or subnetwork-multicast) packets delivered to a higher layer protocol.	Graph	N/A	N/A	1 minute	NETColl	N/A
ifOutErrors Number of packets discarded by the driver before they were transmitted due to errors.	Graph	1	2 to 100	1 minute	NETColl	N/A

Application Class CPQNET continued

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
IfOutNUcastPkts Number of packets that higher level protocols requested be transmitted to a non-unicast (subnetwork-broadcast or subnetwork-multicast) address, including those that were discarded or not sent.	Graph	N/A	N/A	1 minute	NETColl	N/A

Application Class CPQSCSI:

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
CntlrCondition Overall condition of the SCSI controller and any associated logical drives and physical drives controlled by it.	Gauge	3	4	10 minutes	SCSIColl	1=other 2=OK 3=Degraded 4=Failed

Application Class CPQSCSIPHYDRV:

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
PhyDrvCondition Overall condition of the SCSI physical drive.	Gauge	3	4	10 minutes	SCSIColl	1=other 2=OK 3=Degraded 4=Failed
PhyDrvHardReadErrs Number of physical hard drive read errors during the number of hours defined in Service Hours[1].	Graph	1	2 to 100	10 minutes	SCSIColl	N/A
PhyDrvHardWriteErrs Physical hard drive write errors during the number of hours defined in Service Hours[1].	Graph	1	2 to 100	10 minutes	SCSIColl	N/A

Application Class CPQSCSITAPE:

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
TapeCountersTotalErrs Number of tape drive errors during the number of hours defined in Service Hours[1].	Graph	1	2 to 100	10 minutes	SCSIColl	N/A
TapeCountersTotal Uncorrectable Number of uncorrectable tape drive errors during the number of hours defined in Service Hours[1].	Graph	1	2 to 100	10 minutes	SCSIColl	N/A
TapeDrvCondition	Gauge	3	4	10 minutes	SCSIColl	1=other

[1] See Footnote, Page A-3.

Status of the physical tape drive.						2=OK 3=Degraded 4=Failed

Application Class CPQSCST:

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
BoxCondition External ProLiant Storage System Tower condition.	Gauge	3	4	10 minutes	SCSTColl	1=other 2=OK 3=Degraded 4=Failed
FanStatus Status of the ProLiant Storage System Tower fan.	Gauge	N/A	3	10 minutes	SCSTColl	1=other 2=OK 3=Degraded 4=Failed
SidePanelStatus Status of the ProLiant Storage System Tower side panel.	Gauge	N/A	3	10 minutes	SCSTColl	1=other 2=in place 3=removed 4=none
TempStatus Temperature of the ProLiant Storage System Tower.	Gauge	3	4	10 minutes	SCSTColl	1=other 2=OK 3=Degraded 4=Failed

Application Class CPQUPS:

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
AutoShutdownDelay Number of minutes of battery power remaining before the UPS driver begins a graceful shutdown of the operating system.	Gauge	N/A	N/A	10 minutes	UPSColl	N/A
EstimatedBatteryLife Estimated number of minutes of battery power available.	Gauge	N/A	N/A	10 minutes	UPSColl	-1=unable to determine >0=# of minutes of battery life
LineStatus Status of the AC line input to the UPS.	Gauge	N/A	4	10 minutes	UPSColl	1=other 2=OK 3=n/a 4=Failed

Application Class CPQCPU:

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
CpuUtilFiveMin Average CPU utilization as a percentage of the theoretical maximum during the last five minutes.	Graph	80 to 90	90 to 100	5 minutes	UTILIZATIONColl	N/A
CpuUtilThirtyMin Average CPU utilization as a percentage of the theoretical maximum during the last thirty minutes.	Graph	80 to 90	90 to 100	5 minutes	UTILIZATIONColl	N/A

Application Class CPQUTIL:

Parameter Name & Description	Icon Type	Warning Threshold	Alarm Threshold	Collector Polling Schedule	Associated Collector	Enumerated Values
SysUtilEisaBusFiveMin Average EISA bus utilization as a percentage of the theoretical maximum during the last five minutes.	Graph	80 to 90	90 to 100	1 minute	UTILIZATIONColl	N/A
SysUtilEisaBusHour Average EISA bus utilization as a percentage of the theoretical maximum during the last hour.	Graph	80 to 90	90 to 100	1 minute	UTILIZATIONColl	N/A
SysUtilEisaBusThirtyMin Average EISA bus utilization as a percentage of the theoretical maximum during the last 30 minutes.	Graph	80 to 90	90 to 100	1 minute	UTILIZATIONColl	N/A

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