



Hitachi Freedom Storage™
CA Unicenter® Integration Module, Release 1.1
User's Guide

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Source Documents for this Revision

- HDS review of this draft

Changes for this Revision

- Added support for 9500V
- Added information about the consolidation of the two integration modules into one
- Added information about deinstallation (section 2.4)
- Updated classification procedures information (section 3.2)
- Updated Troubleshooting information (Table 4.1)
- Added Classification Utility Completion Message Box figure (Figure 3.2)
- Correction to installation procedures (section 2.2)

Preface

This document describes how to install and implement the scripts and utilities needed to discover and monitor Hitachi Data Systems storage arrays using Computer Associates Unicenter® enterprise management software. Release 1.1 of the CA Unicenter® Integration Module provides the programs and policy scripts necessary to monitor 9900V, 9900, 7700E, 9500V, 9200, 5800, and 5700E storage arrays using CA Unicenter® software. This user's guide assumes that:

- The user has read and understands the user guide for the Hitachi Freedom Storage™ system that will be monitored (for example, the *Hitachi Freedom Storage™ Lightning 9900 User and Reference Guide*, MK-90RD008).
- The user is familiar with the installation and configuration of Computer Associates Unicenter® enterprise management software.
- The user is familiar with the host operating system (for example, Windows NT®).

By leveraging the advanced capabilities of Unicenter®, valuable management data can be obtained from Hitachi Data Systems storage arrays, greatly simplifying the management of these complex systems.

Contact your Hitachi Data Systems account team or refer to the Hitachi Data Systems worldwide web site (<http://www.hds.com>) for additional information on Hitachi Freedom Storage™ systems.

COMMENTS

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Chapter 1 Overview

1.1 Introduction

The CA Unicenter® Integration Module described in this document provides the components necessary for Unicenter® to discover, classify, and monitor Hitachi Freedom Storage™ 9900V, 9900, 7700E, 9500V, 9200, 5800, and 5700E storage systems.

Computer Associates Unicenter® enterprise management software is comprised of three high-level components:

- **World View™**
- **Enterprise Management**
- **Agent Technology**

The **World View™** component of Unicenter® is made up of a database, called the Common Object Repository, and a set of tools used to visualize and organize the data stored within that database. All discovered network entities such as servers, storage subsystems, network devices, and applications are represented with objects in the repository along with their associated class methods, two- and three-dimensional representations, and launch-in-context menus.

The class definitions provided in the Integration Module represent the following devices and components in the Common Object Repository:

- **HDS 9900V**
- **HDS 9900**
- **HDS Managed RAID (HDS 7700E)**
- **HDS Remote Console**
- **HDS 9500V**
- **HDS 9200**
- **HDS 5800E**
- **HDS 5700**
- **HDS SNMP Agent**

Class methods execute tasks such as creating business process views and displaying device information. A **Business Process View** consists of managed objects grouped together according to a user-specified criteria. For example, the objects in a Business Process View may include all Hitachi Freedom Storage™ Lightning 9900™ V Series storage systems in the enterprise whose severity property is set to WARNING or CRITICAL.

The **Enterprise Management** component of Unicenter® addresses specific tasks such as workload management, report generation, and event management. The Integration Module leverages the **Event Management** component of Enterprise Management. The Event Management component can be configured to respond to events generated by Simple Network Management Protocol (SNMP) traps, operating system logs, and Unicenter® Software Developer Kit (SDK) API calls.

The core of the integration is the **Agent Technology** policy that drives the status of all managed objects represented in Unicenter® World View™. The policy is executed by the Agent Technology component of Unicenter®. Agent Technology requires it's own set of class definitions, methods, and menus that are displayed in the **Nodeview** graphical user interface. Nodeview goes a step further than World View™. Whereas World View™ displays all discovered nodes and system agents, Nodeview displays the managed objects monitored by each system agent (Figure 1.1).

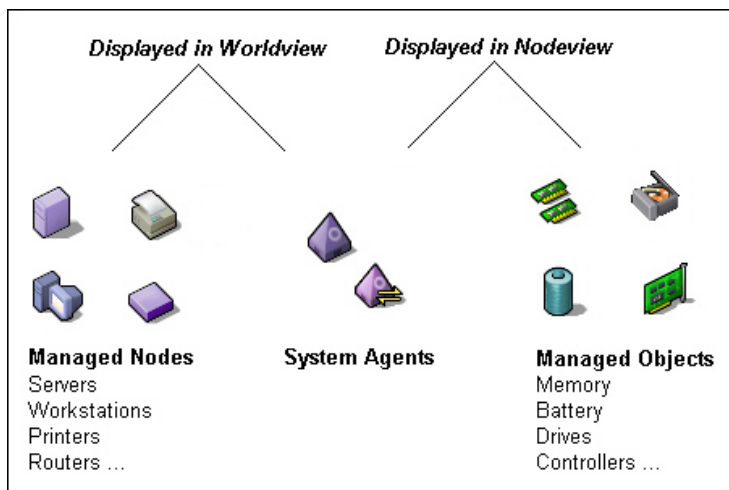


Figure 1.1 Objects Displayed in Unicenter® World View™ and Nodeview

Agent policy may be broken down into discovery policy and management policy. Discovery policy specifies how and when managed objects should be instantiated. Parent-child relationships described in the discovery policy reflect the structure of the SNMP agent's Management Information Base (MIB) in Agent Technology Nodeview (Figure 1.5). Management policy includes trap handling routines, alert message generation, and finite state machines designed to evaluate the current system status based on data that is received by the SNMP agent through polling and trap notifications.

1.2 Integration Environment Components

1.2.1 The Hitachi Freedom Storage™ SNMP Agent

The Simple Network Management Protocol, or **SNMP**, is an industry standard protocol used to instrument and monitor network devices and software remotely. The Hitachi Freedom Storage™ SNMP Agent provides built-in manageability for Hitachi Freedom Storage™ systems. The Hitachi Freedom Storage™ SNMP Agent collects system identification, version information, and component status information, and then makes this information available to network management applications.

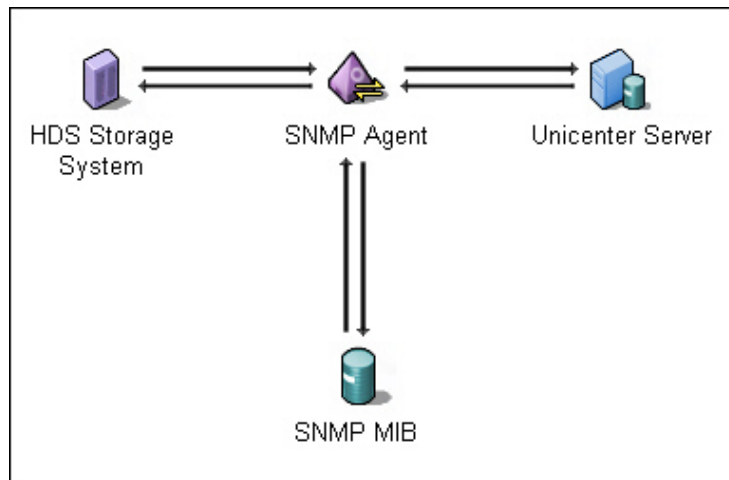


Figure 1.2 SNMP Agent Communication Paths

SNMP defines an unsolicited notification as a **trap**. Traps are generated when a critical event or system status change occurs on a managed entity. For example, if a drive failure occurs on a storage system, a notification is sent out to one or more network management servers even though the information was not specifically requested. Network management servers that need to receive traps must first be registered with the Hitachi Freedom Storage™ SNMP Agent.

1.2.2 The Unicenter® Server

The Integration Module described in this document integrates into the following components of Unicenter®:

- Common Object Repository
- Distributed State Machine
- Event Management Console

Unicenter®'s **Common Object Repository** is a database that stores information about the managed entities discovered on a network. It stores class definitions for different types of network devices and software. The Common Object Repository also contains class definitions useful for displaying organizational relationships between managed objects. Organizational class types may be used to represent geographic locations, network links, business processes, and managed domains. Additional custom classes can be created from scratch or derived from existing classes in the Common Object Repository. This is especially useful when incorporating new devices to the management domain that are not already defined by Unicenter®.

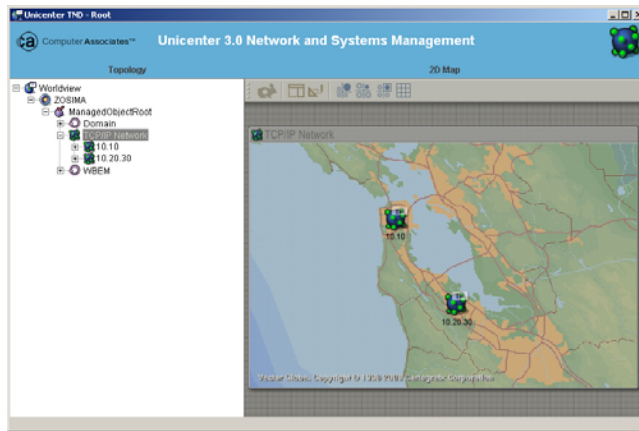


Figure 1.3 Unicenter® Explorer 2D Map Interface

A variety of tools may be used to view and organize network components that have been discovered and populated in the Common Object Repository. Network assets may be viewed using Explorer-style graphical interfaces that organize repository objects according to class hierarchy, network topology, or geographic location (Figure 1.3). Network components may be displayed using two- or three-dimensional representations (Figure 1.4).

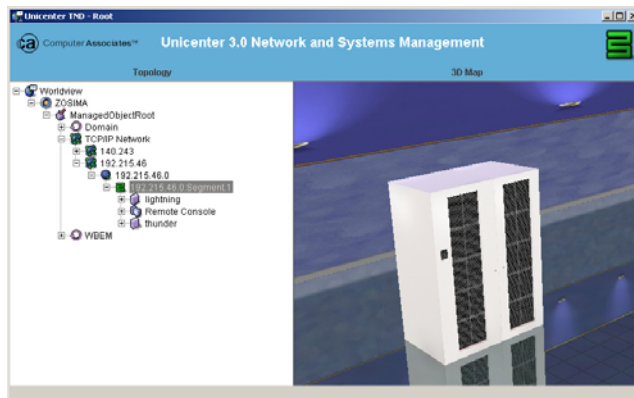


Figure 1.4 Unicenter® Explorer 3D Map Interface

The **Distributed State Machine (DSM)** is made up of a set of services that discover and keep track of agents residing on network resources. An **agent** is a specialized program written to manage a specific host, network device, or piece of software. Agent design is extremely flexible, leading to a wide variety of agent types. Agents may be embedded into a piece of hardware, or they may also run on a device separate from the actual hardware or software being managed. The latter is commonly referred to as a **proxy agent**. An example of this is the Hitachi Freedom Storage™ SNMP Agent that resides on the Hitachi Remote Console PC and collects management information from Hitachi Freedom Storage™ systems via a network link. Agents extract critical management information from monitored network resources and make it available to network management servers. Agents that are designed to use SNMP store the information they collect in a database referred to as a Management Information Base or **MIB**. Each agent is programmed to query a pre-determined set of values from the entity it manages. A text file describing the set of values that the agent collects is available with every SNMP agent and is called a **MIB File**. It tells the SNMP management application which property values can be queried for a particular agent and provides the unique object identifiers (OIDs) needed to request them.

The DSM polls agents for system status information, listens for incoming alerts, and processes the information retrieved in order to determine the status of the managed resource. Because every agent is different, DSM policy files must be written to specify rules for discovery, polling, state changes, and alert handling. The DSM stores information it collects from managed entities in the Agent Technology Object Store.

The **Agent Technology Object Store** is a database separate from the World View™ Common Object Repository. The Object Store describes managed objects using its own set of class definitions and parent-child relationships. The contents of the Object Store database are displayed by Agent Technology Nodeview (Figure 1.5).

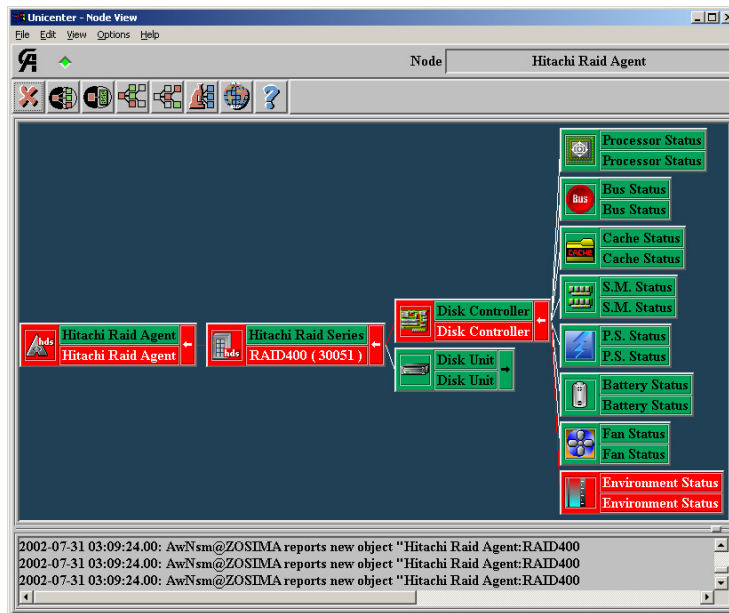


Figure 1.5 Unicenter® Agent Technology Nodeview

Unicenter® **Event Management** is a focal point for integrated message management throughout a networked environment. The **Event Management Console** monitors and consolidates message activity from a variety of sources (Figure 1.6). In addition to message consolidation and monitoring capabilities, Unicenter® Event Management allows you to associate specific actions with system messages routed to the Event Management Console by creating a set of database records called message records and actions. Message records function as identifiers for specific messages routed to the Event Management Console. When an incoming message matches a message record, the message actions associated with the message record are executed. The Unicenter® Integration Module creates a set of message records and actions in the Event Management database during the installation process. Defined actions include placing high priority messages in a console holding area where they will remain until acknowledged. The message records included in this integration are a starting point for further customization at the client site. For example, if a particular IT department makes extensive use of 2-way pagers, an additional message action can be defined to notify system administrators via text page.

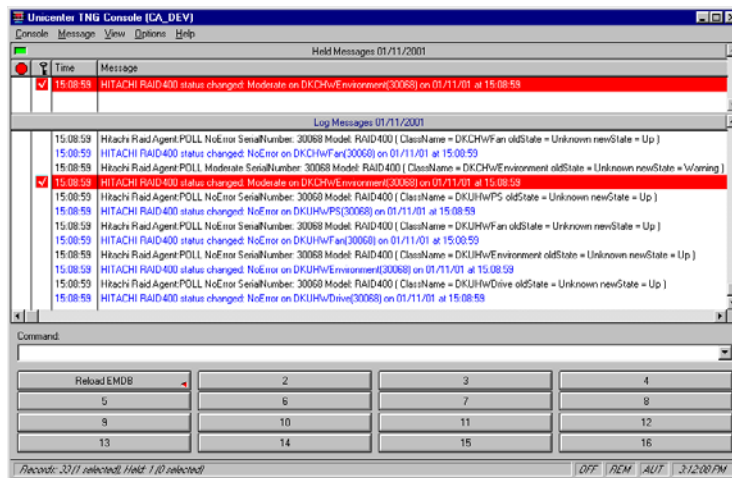


Figure 1.6 Unicenter® Event Management Console

1.3 Integration Features

1.3.1 Discovery and Classification

Two components are necessary for Unicenter® to properly discover and classify network nodes. First, a **class definition** must exist in the Common Object Repository for each network entity to be discovered. Class definitions include class and instance level properties, icon files for 2D and 3D World View™ representation, and launch-in-context menu descriptions. Second, an object of class **sysObjID** must be created in the Common Object Repository to associate the World View™ class that describes the node with the SNMP system object identifier returned during the discovery process (Figure 1.7).

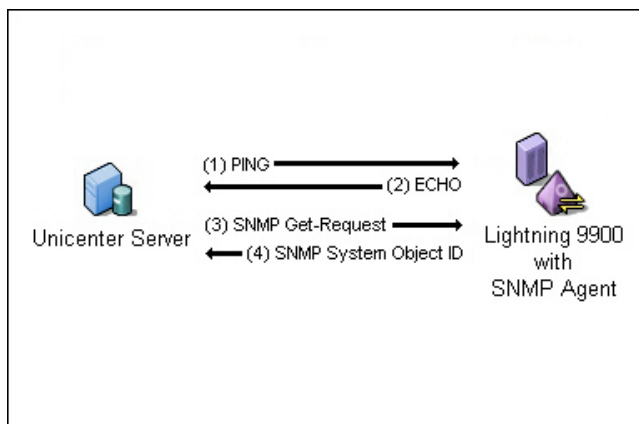


Figure 1.7 Discovery of Lightning 9900™ by Unicenter®

The discovery process discovers and classifies nodes in two steps. First, a ping (ICMP) packet is sent to the IP address being queried to see if a device is attached to the network at that address. If a response is received, the discovery process is aware that a device is present, however, in order to identify the device, additional information is required. The additional information is obtained by sending an SNMP packet requesting a unique identifier for the node type. If SNMP is enabled on the node, it will respond by returning a string of dot-separated numbers known as a **system object identifier**. The system object identifier used to identify Hitachi Freedom Storage™ Remote Consoles and Lightning 9900™ disk subsystems is 1.3.6.1.4.1.116.3.11.4.1.1. Upon receipt of the response packet with the system object identifier of the queried device, the discovery process checks the value against a list of objects of class sysObjID in the Common Object Repository. Since the system object identifier 1.3.6.1.4.1.116.3.11.4.1.1 maps to the class Raid300Con (Hitachi Remote Console), an object of class Raid300Con is instantiated in the Common Object Repository to represent the Hitachi Remote Console in the World View™ interface. Instance level properties for the new Raid300Con object such as IP address, device name, and location are also filled in if the SNMP agent provides them.

Since Hitachi Remote Console Workstations, Lightning 9900V, and Lightning 9900 series storage systems share the same SNMP system object identifier, they cannot be uniquely identified during the initial discovery process. Therefore, Unicenter® Auto Discovery initially classifies them in the Common Object Repository as **Raid300Con** (Hitachi Remote Console Workstation) objects. The same applies to Thunder 9500V, 9200™, 5800, and 5700E storage systems which are initially represented by objects of the generic class, **HDS_DFRAID**. Each Unicenter® Integration Module includes a reclassification program that may be invoked from Unicenter®'s World View™ interface in order to classify storage arrays that share the same system object identifier more precisely (section 3.2).

If the Hitachi Freedom Storage™ SNMP Agent is not enabled on the device being discovered or if the SNMP query times out, an object of type **Unclassified_TCP** is created in the Common Object Repository. Unclassified objects can be manually reclassified by selecting the **Reclassify Object** method in the launch-in-context menu associated with the node, or they may be deleted and rediscovered.

Unicenter® 3.0 introduces the **Unicenter® Explorer** (Figure 1.8). Unicenter® Explorer integrates all World View™ GUI components and tools into a single interface.

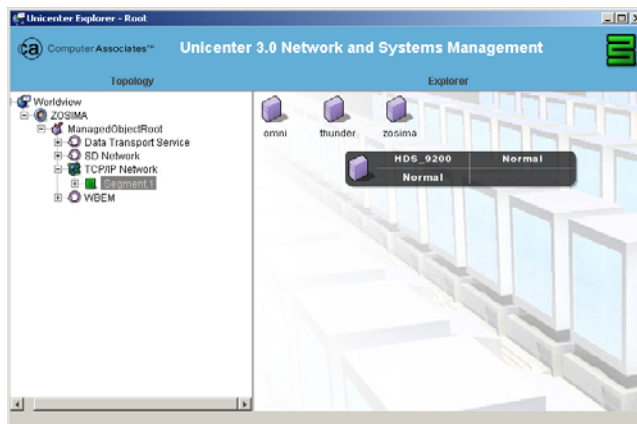


Figure 1.8 Unicenter® Explorer Interface

Once all network nodes have been discovered and classified during initial discovery, the next step is to find out whether or not a particular agent resides within that node. This **second-level discovery** is a function of Unicenter® Agent Technology. When Unicenter® agent services are started, a list of all discovered nodes in the Common Object Repository is obtained from the Agent Technology **World View™ Gateway** service. The nodes in the list are then queried for resident agents based on their class. To accommodate new platforms and agents, Agent Technology can be configured to check for any agent on any platform. For example, if the list of objects retrieved from the Common Object Repository includes an object of type **HDS_9900**, Unicenter® agent services will send an SNMP packet to the node requesting a MIB variable unique to the Hitachi Freedom Storage™ SNMP Agent. If a valid response is received, a **Hitachi Raid Agent** object is instantiated in the Common Object Repository (Figure 1.9).

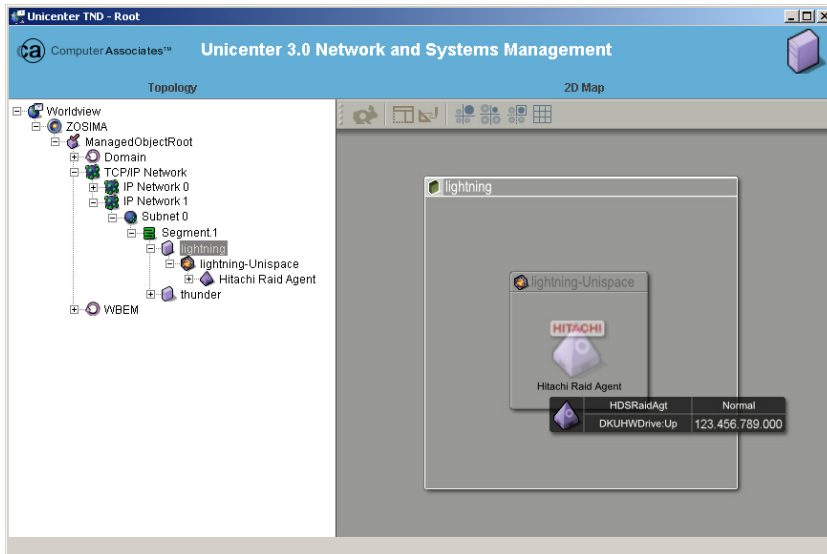


Figure 1.9 HDS Raid Agent Object instantiated in HDS 9900 Unispace

Since Hitachi Freedom Storage™ 7700E disk arrays are located on a private LAN segment, Unicenter® monitors them by communicating with the SNMP agent that resides on Remote Console. Therefore, Hitachi Freedom Storage™ 7700E storage arrays are discovered and classified as **ManagedHDSRaid** objects by the second-level discovery mechanism executed by Agent Technology and placed one level below the HDS RAID Agent object in World View™ (Figure 1.10).

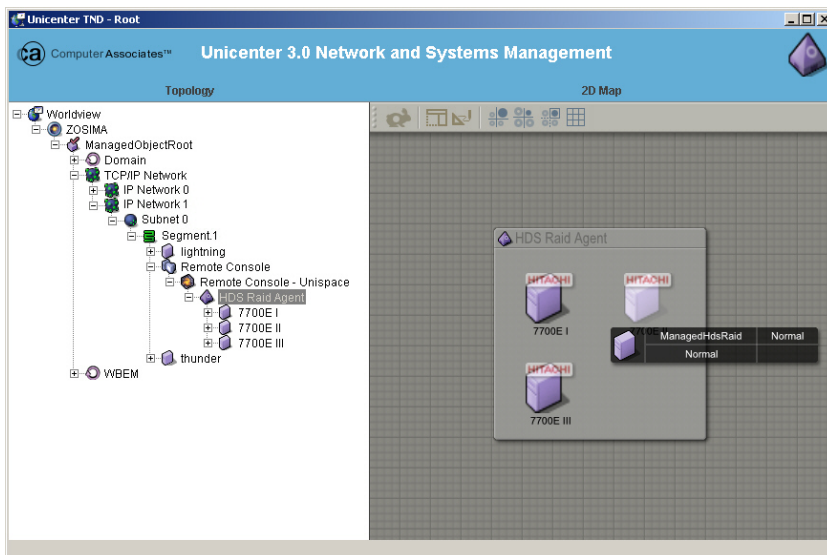


Figure 1.10 HDS 7700E Storage Systems Discovered below SNMP Proxy Agent

The integration module includes Agent Technology policy that instructs the Distributed State Machine to communicate with monitored Hitachi Freedom Storage™ systems. The policy programs the Distributed State Machine to poll several variables provided by the Hitachi Freedom Storage™ SNMP Agent periodically in order to ensure Hitachi Freedom Storage™ systems are up and functioning properly. For 9900V, 9900, and 7700E storage arrays, these variables represent the following components:

- Disk Controller Processor Status
- Disk Controller Internal Bus Status
- Disk Controller Cache Status
- Disk Controller Shared Memory
- Disk Unit Power Supply Status
- Disk Unit Fan Status
- Disk Controller Power Supply Status
- Disk Controller Battery Status
- Disk Controller Fan Status
- Disk Controller Environment Status
- Disk Unit Drive Status
- Disk Unit Environment Status

Components that are monitored for 9500V, 9200, 5800, and 5700E storage arrays include:

- DF Drive Maintenance
- DF Cache Load
- DF Regression Status
- DF Drive Block
- DF Spare Drive
- Disk Unit Fan Status
- DF Data Drive
- DF Enclosure Controller
- DF Mate Controller
- DF Fibre Loop
- DF Power Supply
- DF AC Power
- DF UPS
- DF Battery
- DF Battery Charging Circuit
- DF Fan
- DF Cache

The policy also programs the Distributed State Machine to listen for SNMP traps generated by the Hitachi Freedom Storage™ SNMP Agent. Traps are sent out by the agent to registered network management nodes whenever a critical event occurs. The IP address of the Unicenter® server must be provided to the Hitachi Freedom Storage™ SNMP Agent in order to receive SNMP traps.

When status changes are detected, managed objects representing the storage system components are updated in the Object Store. The Agent Technology World View™ Gateway service provides a conduit between the Agent Technology Object Store and the World View™ Common Object Repository so that status updates generated by the Distributed State Machine also update objects in the World View™ Common Object Repository.

1.3.2 Enterprise Management Event Processing

The event processing facilities of Unicenter® allow an administrator to monitor message traffic, establish date and time controls for automated event processing, trap important event messages, and assign actions.

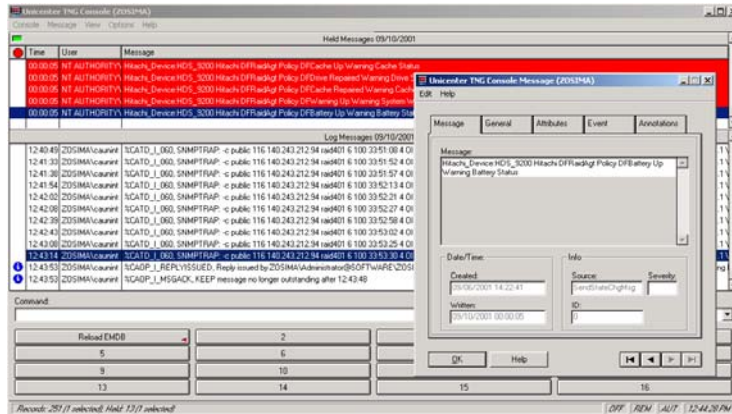


Figure 1.11 Unicenter® Event Console and Message Detail Window

The Agent Technology policy included in this integration module generates status change messages that are sent directly to the Event Management console. The messages arrive in the following formats:

Message Format 1:

RAIDTYPE status changed: NEWSTATUS on COMPONENT(SERIALNO) on DATE at TIME

Message Format 2:

Hitachi Raid Agent:MSGTYPE SEV SerialNumber: SERIALNO Model: MODEL (ClassName = COMPONENT oldState = S1 newState = S2)

For example:

HITACHI RAID401 status changed: NoError on DKUHWPS(60229) on 10/17/01 at 12:45:30

Hitachi Raid Agent:POLL NoError SerialNumber: 60229 Model: RAID401 (ClassName = DKUHWPS oldState = Unknown newState = Up)

This integration module creates a set of message records and actions in the Event Management database to identify all messages that are generated by the Hitachi Freedom Storage™ SNMP Agent and its associated Agent Technology policy.

1.3.3 Business Process Views

Unicenter® Business Process Views provide a way to organize the information collected in the Common Object Repository according to any criteria. By default, discovered nodes, applications, and agents are organized in the World View™ 2-D and 3-D maps according to network topology and predetermined parent-child relationships. Each of the node types defined by the integration module includes a class method that creates a Business Process View for that particular class. Selecting the method will create a window at the top level of the 2-D map interface containing all nodes of that type found in the Common Object Repository (Figure 1.12).

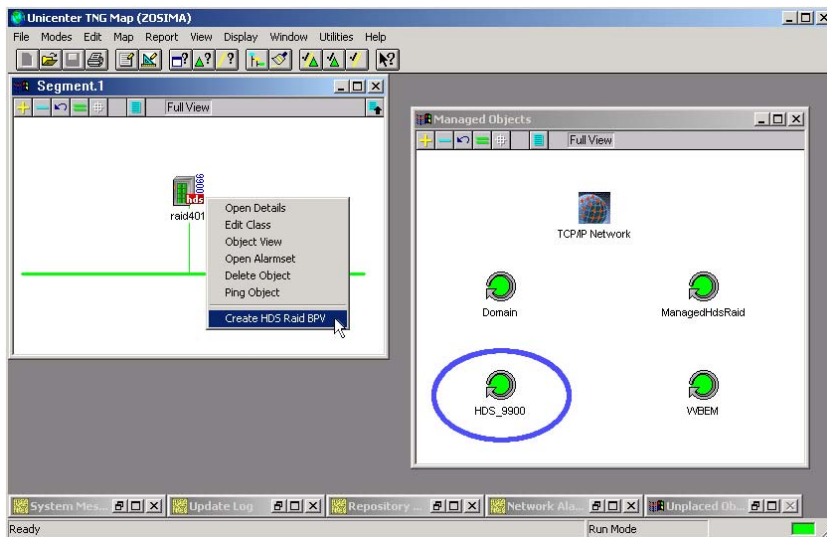


Figure 1.12 HDS_9900 Business Process View in World View™ 2-D Map

1.3.4 Unicenter® Management Portal

Unicenter® Management Portal, available with Unicenter® 3.0, allows system administrators to make important information regarding network resources available on the web. Users accessing information published in Unicenter® Management Portal must first receive the required permission from the system administrator.

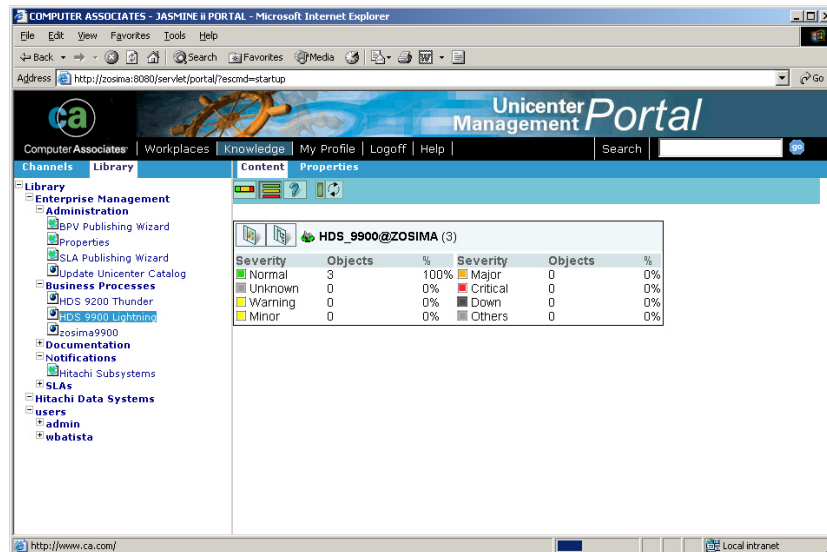


Figure 1.13 Business Processes Component of Unicenter® Management Portal

Two sources of information this integration module make available for publication in Unicenter® Management Portal are Business Process Views and event data generated by Agent Technology policy and forwarded through the Enterprise Management event console.

The BPV Publishing Wizard in Unicenter® Management Portal provides a simple method for publishing Business Process Views defined in the World View™ Common Object Repository.

Event information for Hitachi Freedom Storage™ systems may be accessed through the Notification component (Figure 1.14) of Unicenter® Management Portal.

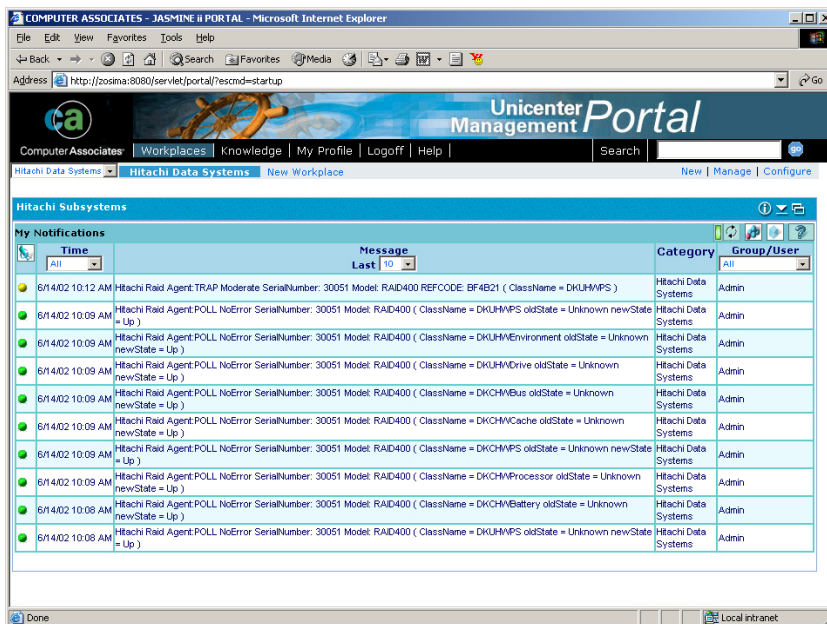


Figure 1.14 Notification Component of Unicenter® Management Portal

Chapter 2 Installation

2.1 System Requirements

Prior to installing this integration module, a supported version of Unicenter® must be installed and be verified operational.

2.1.1 Supported Unicenter® Configurations

The following versions of Unicenter® are supported by this integration module:

- Unicenter® TNG version 2.2 on Windows NT® patch genlevel 9907 or higher
- Unicenter® TNG version 2.4 on Windows NT® or Windows 2000 patch genlevel 0000 or higher
- Unicenter® version 3.0 on Windows NT® or Windows® 2000 patch genlevel 0000 or higher

2.1.2 Disk Space Usage

Approximately 3 MB on the Unicenter® server.

2.1.3 Memory Requirements

The Unicenter® server should have a minimum of 256 MB of memory.

2.1.4 Processor Requirements

A minimum of a 300 MHz Pentium II processor is suggested for adequate performance.

2.1.5 Software Requirements

The Windows® SNMP service must be installed.

2.2 Installation Procedure

Before installing the Unicenter® integration, ensure that:

- Unicenter® Agent Services are not running.
- Any application that accesses the Common Object Repository is not running.
- No other applications are running.
- Unicenter® server has been backed up.

To begin the installation process:

1. Load the CA Unicenter® Integration Module Installation CD-ROM.
2. Open the **Start** menu, select **Run**, and navigate to the CD directory. Run the **Setup.exe** program located in the **SETUP** directory.
3. If a version of Unicenter® prior to 2.2 is installed, a message box will appear, and the installer will exit.
4. The Hitachi Data Systems License Agreement panel will display. Select **Yes**, and the Component Selection Panel will display.
5. If the node you are installing the integration module on will only be used as a World View™ client and will not run the Agent Technology policy on its local Distributed State Machine, select the World View™ component only. Otherwise, select all components and select **Next** to continue.
6. InstallShield Wizard will now run the integration module installation scripts. In order for the install scripts to access the Unicenter® Common Object Repository to define new classes, the Unicenter® Repository login dialog box will display requesting a User ID and password.
7. A message box will appear asking whether or not event messages generated by the integration module should be forwarded to a Unicenter® Management Portal server. If your installation includes a Unicenter® Management Portal, you may select **Yes**.
8. If event messages will be forwarded to a Unicenter® Management Portal server, InstallShield Wizard will prompt the user to enter the Portal server's hostname and the associated username, password, and user group authorized to access the data.
9. Select **Finish** when the **Installation Complete** panel displays.

IMPORTANT: Proceed with post-installation configuration tasks.

2.3 Post-Installation Configuration

Once the integration files are installed, it is critical that the Unicenter® server be configured properly in order to discover, classify, and monitor Hitachi Freedom Storage™ disk subsystems.

2.3.1 Configuring SNMP Community Names

In order to allow the **Agent View** method to communicate with the SNMP agent residing on the monitored array, verify that the community string is correct for the object representing the monitored array in the Common Object Repository. This can be done by selecting the **Open Details** method from the objects popup menu in the World View™ or Explorer® interface and selecting the **SNMP** tab. The property **get_auth_name** should be set to the community string with read-only access, and **set_auth_name** set to the community with read-write access.

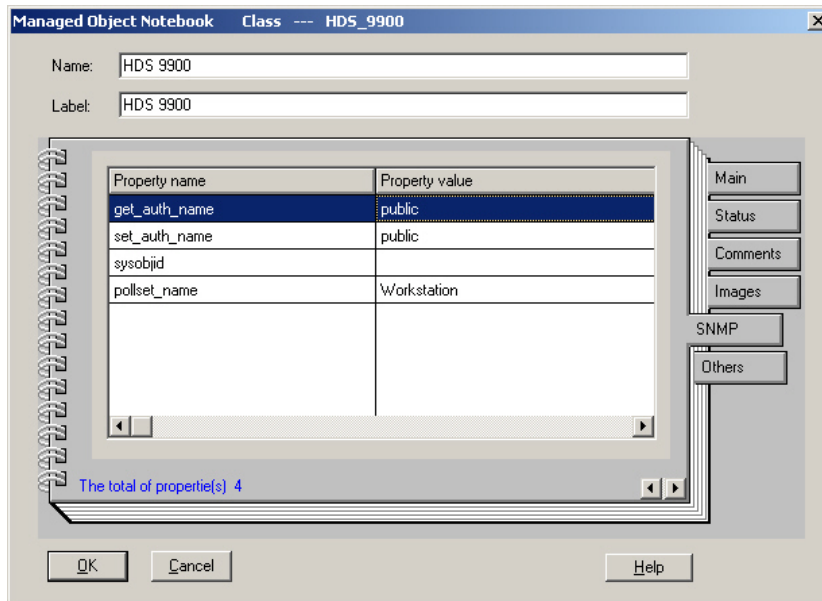


Figure 2.1 Open Details Dialog with SNMP Panel Selected

2.3.2 Configuring SNMP Polling Intervals for RAID Series Storage Arrays

The interval at which Agent Technology polls RAID Series arrays is originally set to one minute. To adjust the interval at which Agent Technology policy polls the SNMP agent residing on a RAID Series monitored array, you must modify the following entry in the file `$CAIGLBL000\services\config\aws_nsm\dm\HDSRaidAgt.dat`:

```
#moclprop
moclprop_class   :Agent:HDSRaidAgt
moclprop_index   :NextIndex
moclprop_prop    :pollInterval
moclprop_value   :60
```

By default, the value (in seconds) is set to one minute.

2.3.3 Configuring SNMP Polling Intervals for DF Series Storage Arrays

The interval at which Agent Technology polls DF Series arrays is originally set to one minute. In order to adjust the interval at which Agent Technology policy polls the SNMP agent residing on a DF Series monitored array, you must modify the following entry in the file `$CAIGLBL000\services\config\aws_nsm\dm\dfraid.atp`:

```
int  pollInterval = 60;
```

By default, the value (in seconds) is set to one minute.

2.3.4 Configuring Managed Nodes

Verify that the IP addresses of the disk subsystems to be monitored are specified in the file `$CAIGLBL0000\services\config\aws_wvgate\gwipflt.dat`.

2.3.5 Configuring Enterprise Management Command Authorization List

In order to allow Agent Technology policy to forward messages from the Unicenter® Event Management Console to the Unicenter® Management Portal Notifications page, the **SYSTEM** user must be appended to the list of users authorized to issue commands. This can be done through **EM Settings** on the **Event Management** tab (Figure 2.2).

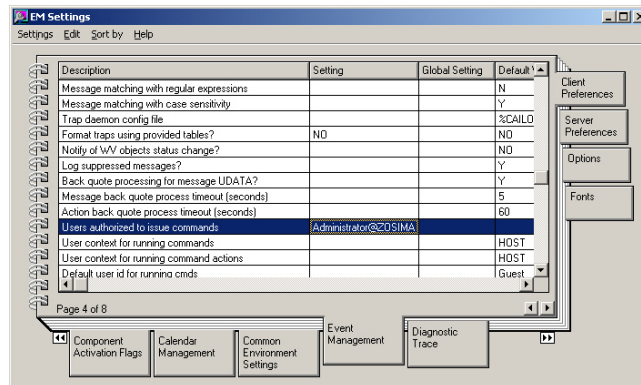


Figure 2.2 Event Management Panel in EM Settings

2.4 Deinstallation Procedure

To remove the Hitachi Freedom Storage Unicenter Integration Module, open the **Control Panel** and select **Add/Remove Programs**. Select the item **Hitachi Freedom Storage Unicenter Integration Module** to launch the de-installation routine. A welcome panel will appear and provide several options as shown in Figure 2.3. To completely remove the integration module, select **Remove**. You may also choose to reinstall all program components or to modify which components are installed. The latter may be the case if you had previously elected not to install all three integration components (Worldview, Enterprise Management, Agent Technology).

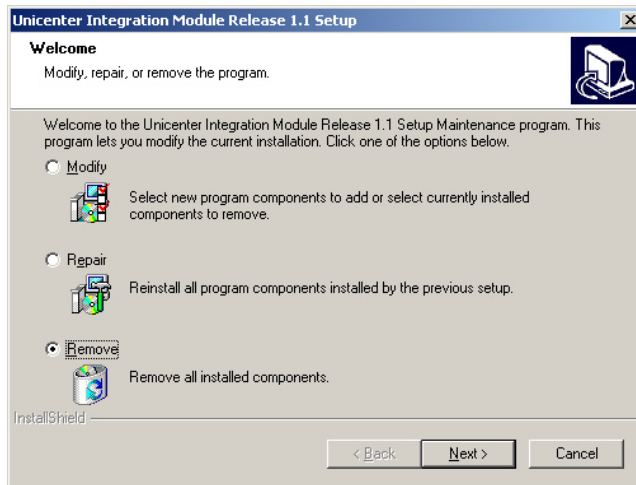


Figure 2.3 Deinstallation Welcome Panel

Chapter 3 Monitoring Storage Arrays

3.1 Discovery

Unicenter® provides two options for discovery of nodes on the network: the command **dscvrbe** and Auto-Discovery. **dscvrbe** may be used from the command line if you are only interested in discovering a single device. Options for this utility include the IP address or node name of the device and the name of the Common Object Repository where you would like the node's information stored. Please see the Unicenter® reference manual for additional information regarding **dscvrbe**. Unicenter® World View™ also provides **Auto-Discovery**. Auto-Discovery allows you to discover all nodes on one or several network segments.

3.2 Classification Procedure

After Auto-Discovery is finished, you may open up the Unicenter® 2-D Map to view the discovered Hitachi Freedom Storage™ subsystems. If you are monitoring RAID Series storage arrays, 9900V, 9900, 7700E, and Remote Console Workstations will all be classified as **Raid300Con** (Remote Console Workstation) objects. If you are monitoring DF Series storage arrays, 9500V, 9200, 5800, and 5700E will all be classified as **HDS_DFRAID** objects. The reason for this is that the RAID Series and DF Series storage arrays share the same system object identifier making it impossible to distinguish between the model types during an initial SNMP discovery. RAID300Con and HDS_DFRAID objects both have a reclassify method (Figure 3.1) associated with them that may be accessed from their associated menus. The reclassify methods check the Common Object Repository for RAID Series or DF Series objects and request additional information from the SNMP agent in order to classify the storage arrays more precisely. The Hitachi Freedom Storage Classification Utility checks the Common Object Repository for RAID Series and DF Series objects and requests additional information in order to classify the storage arrays according to their model number.

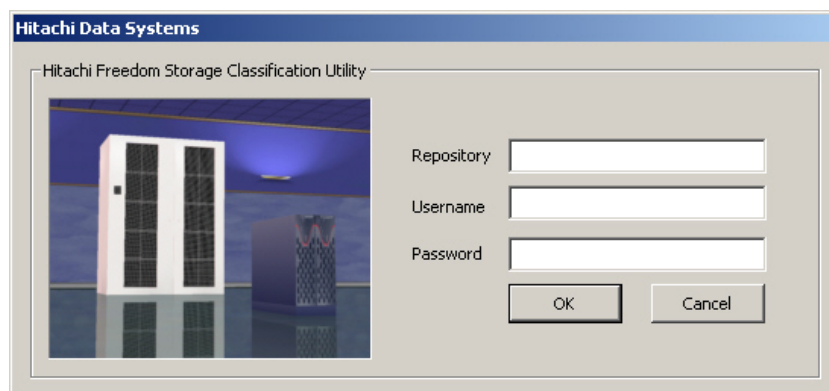


Figure 3.1 RAID Series and DF Series Reclassification Methods

The Hitachi Freedom Storage Classification Utility takes three parameters: the name of the Common Object Repository along with the corresponding username and password. Fill them in and click on OK. A message window will appear after the process completes stating the number of objects found in the Common Object Repository and how many of them were reclassified (Figure 3.2).

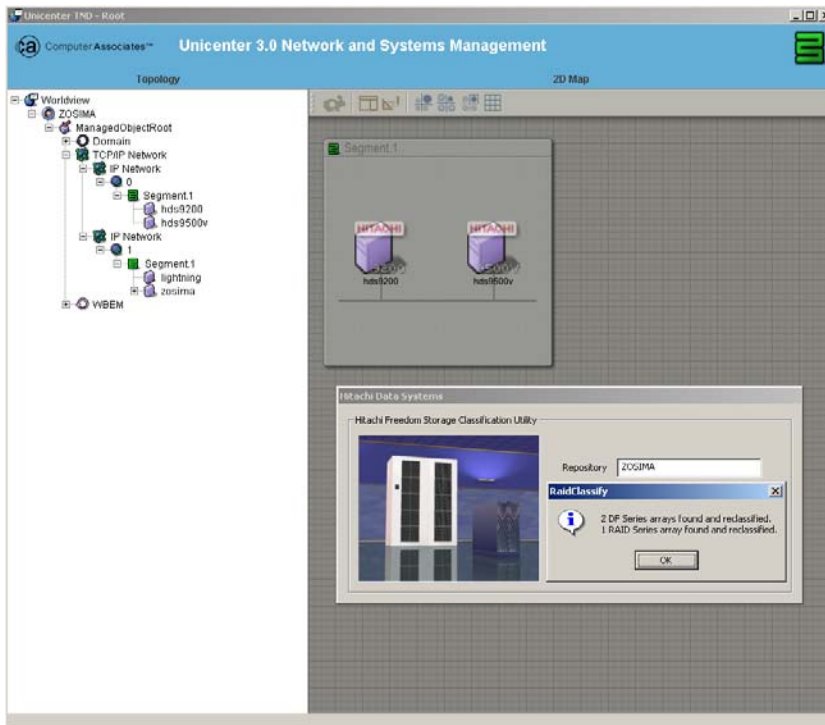


Figure 3.2 Classification Utility Completion Message Box

3.3 Agent Technology Second-Level Discovery

The Agent Technology Policies included in this integration module configure Unicenter® Agent Services to automatically discover the SNMP Agent present in each Hitachi Freedom Storage™ system found in the Common Object Repository. An object representing the SNMP agent is then created in the Common Object Repository. Agent Services may be started from the command line using the following command:

awservices start

The Agent Technology Policy included in this integration module requests additional information from the SNMP agent running on the Hitachi Freedom Storage™ subsystem in order to create several managed objects. These managed objects represent variables in the SNMP agent's MIB that will be monitored by Unicenter®. Managed Objects are stored in the Agent Technology Object Store and may be viewed through **Nodeview**, the graphical user interface used to display the contents of Agent Technology's Object Store.

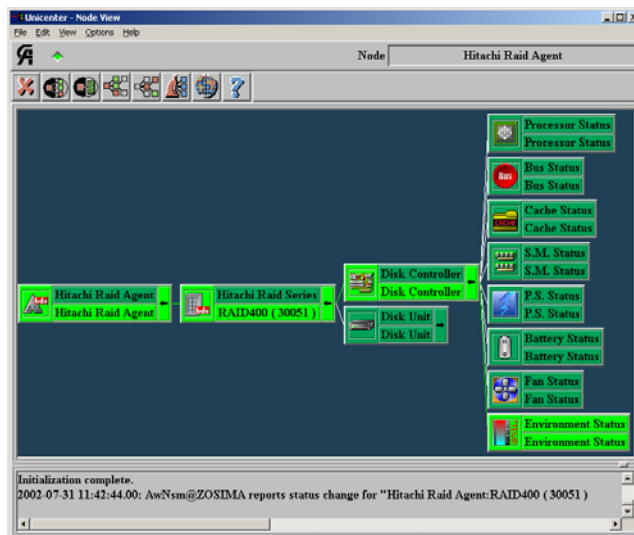


Figure 3.3 Agent Technology Nodeview

3.4 Cache Load and RAID Information AWGUI Scripts (9500V and 9200 Only)

Two scripts are provided with this integration for quick and easy access to basic information regarding managed DF Raid disk subsystems. Both scripts can be run from the Unicenter® World View™ Interface. The Cache Load script may be accessed by through the Cache Load icon in World View™ by accessing the launch-in-context menu and selecting the “View Cache Load” class method.

The Cache Load GUI polls the MIB variable dfWriteDataRate which provides the write data rate in cache memory (Figure 3.4). The poll interval may be adjusted within the GUI by typing in the new value and clicking on the refresh button. Click the Refresh button to immediately update the Cache Load value.

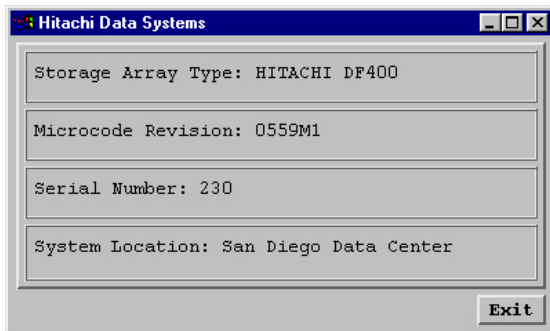
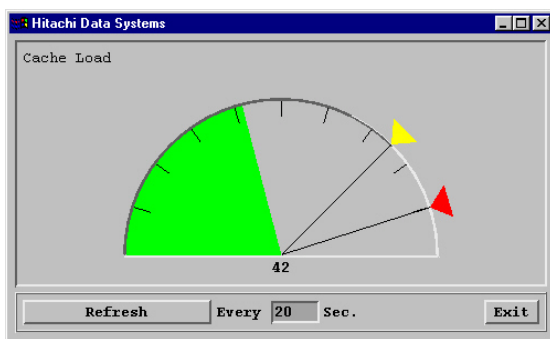


Figure 3.4 Cache Load and DF Raid Information GUIs

The DF Raid Information GUI provides basic information for the managed DF disk subsystem. Information includes the storage system type (for example, DF300, DF350, or DF400), the microcode revision level, the system serial number, and it's location.

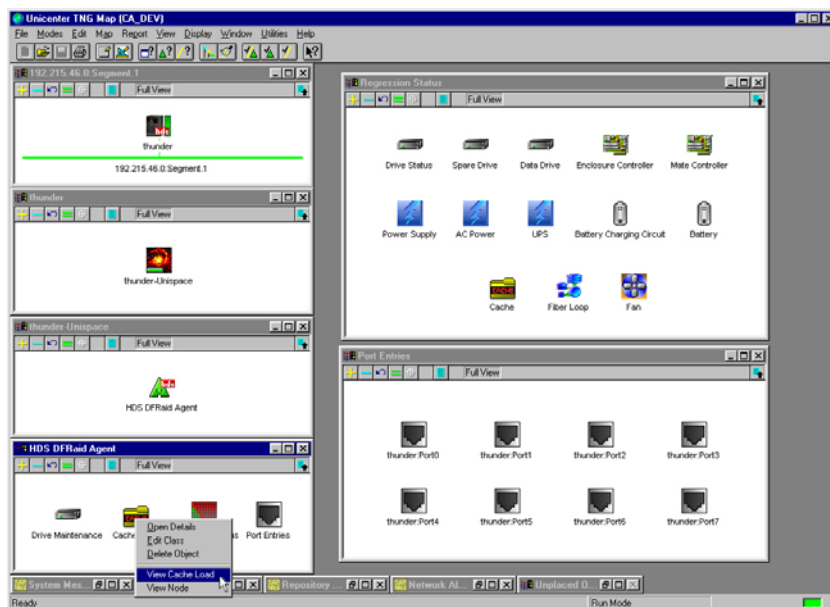


Figure 3.5 Accessing the Cache Load GUI through 2-D Map

Class methods are defined for each script so that they may be associated with the appropriate classes within the Unicenter® World View™ Interface. The Cache Load GUI script is associated with the launch-in-context menu for the World View™ class, DFCacheLoad, and the DF Raid Information GUI is associated with the launch-in-context menu for the class DFRaidAgt.

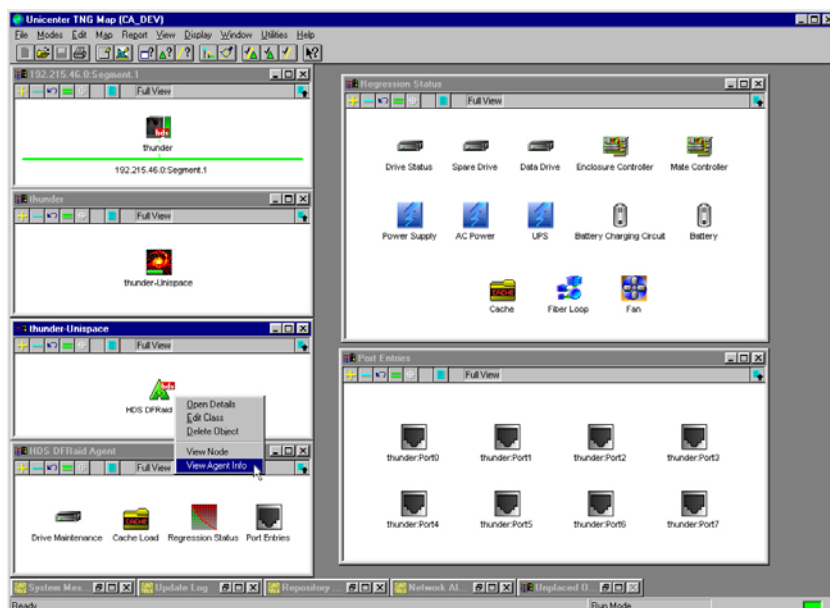


Figure 3.6 Accessing the DF Raid Information GUI through 2-D Map

3.5 System Status HTTP Server Class Method (9500V and 9200 Only)

The Hitachi Freedom Storage™ 9500V and 9200 disk subsystems come pre-configured with an integrated HTTP server that provides system status and configuration information. The status page may be displayed by accessing System Status Page class method from the launch-in-context menu for an HDS 9200 object in World View™ (Figure 3.7).

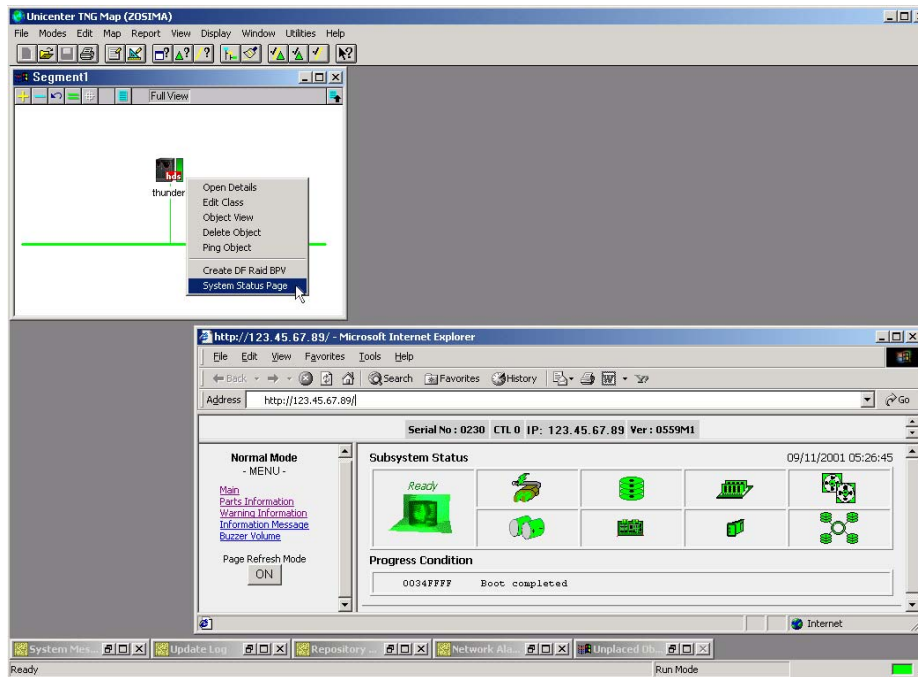


Figure 3.7 Accessing the DF Raid Status Page through Unicenter® World View™

3.6 Publishing Business Process Views in Unicenter® Management Portal

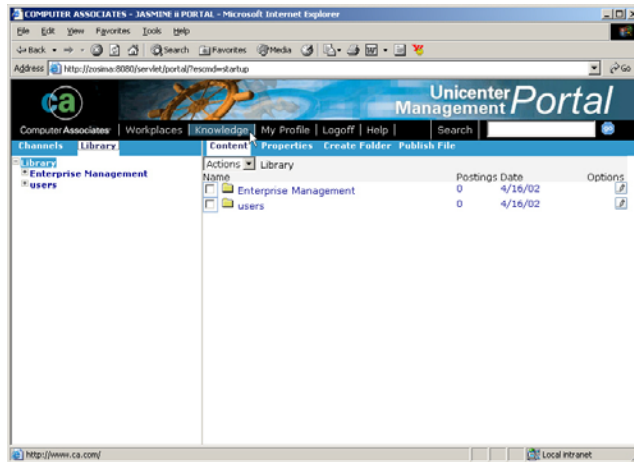


Figure 3.8 Selecting Knowledge Link in Unicenter® Management Portal

1. Log into the Unicenter® Management Portal and select the **Knowledge** link on the upper part of the page (Figure 3.8).

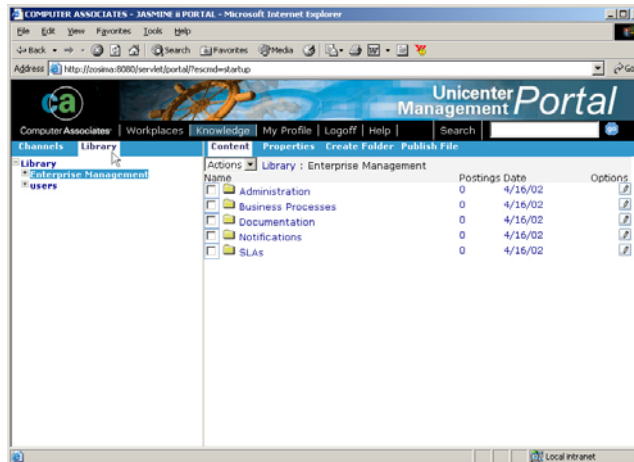


Figure 3.9 Selecting Library link in Unicenter® Management Portal

2. Click on the **Library** link (Figure 3.9) followed by the **Enterprise Management** folder in the tree structure that appears beneath it.

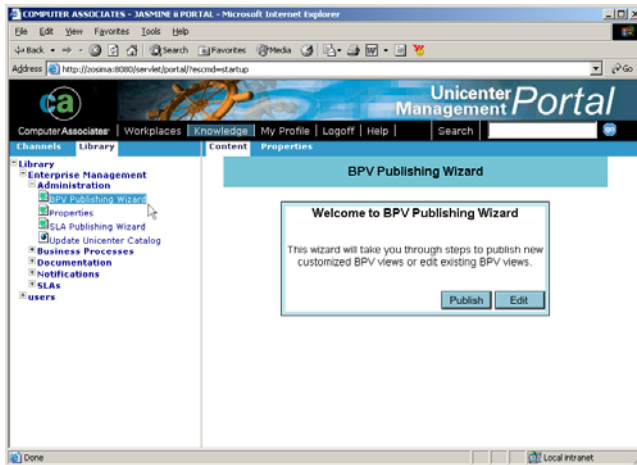


Figure 3.10 BPV Publishing Wizard

3. Expand the **Administration** node and select **BPV Publishing Wizard**.

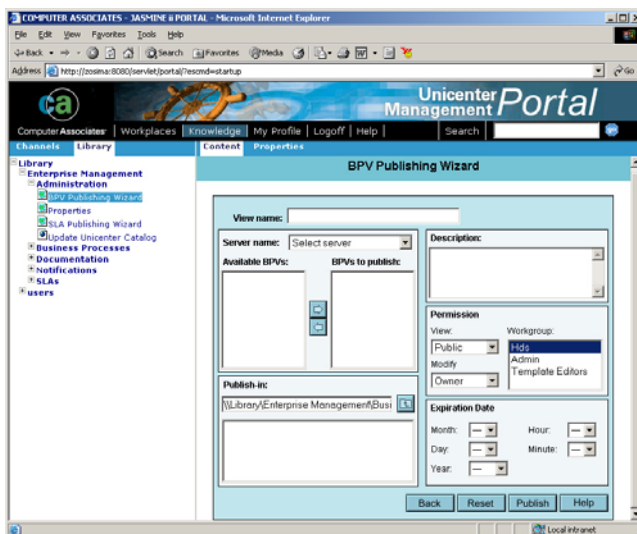


Figure 3.11 Selecting a Unicenter® Repository Serve.

4. Select the Unicenter® Repository that stores the Business Process View you wish to publish in the **Server name** drop down list.

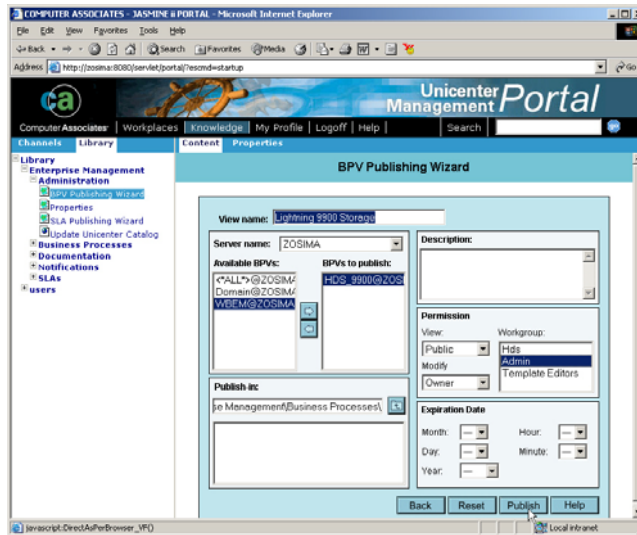


Figure 3.12 Selecting Business Process Views to Publish

5. Select the Business Process Views you wish to publish in the Portal and click on the **Publish** button on the bottom right. Business Process Views may be viewed by expanding the **Business Processes** node on the left side of the page and then selecting a specific Business Process View.

3.7 Viewing Event Management Notifications in Unicenter® Portal

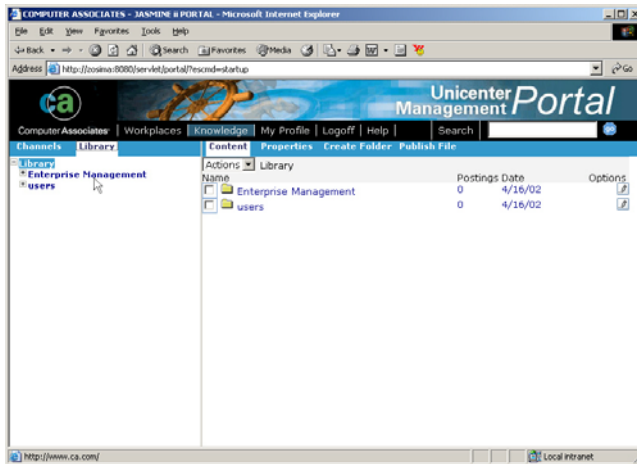


Figure 3.13 Selecting the Enterprise Management Node

1. Select the Enterprise Management node.

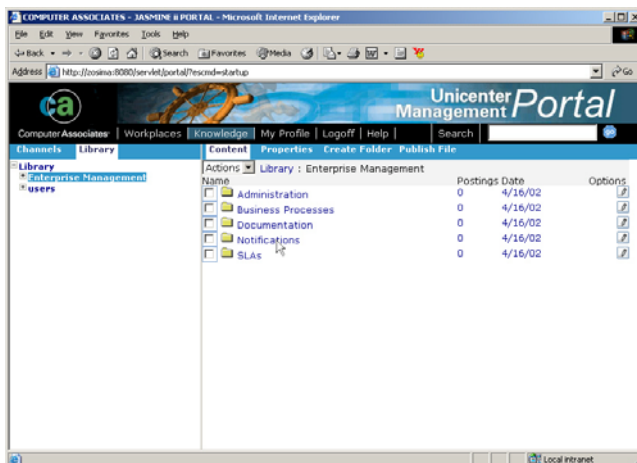


Figure 3.14 Selecting the Notifications Folder

2. Click on the **Notifications** folder. When viewing notifications, make sure the Group and User are set to the appropriate values. In order to view events generated by this integration module, you must have selected **Yes** when asked if you would like to forward events to the Unicenter® Management Portal during the installation process.

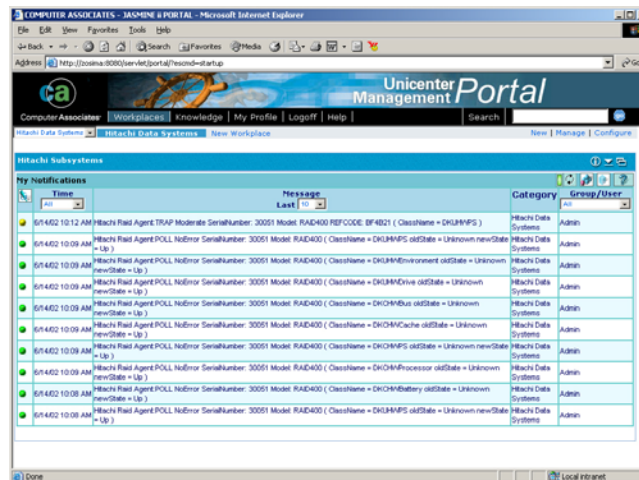


Figure 3.15 Viewing Notifications

Chapter 4 Troubleshooting

4.1 Troubleshooting

Table 4.1 lists potential error conditions during 9900V device configuration and provides instructions for resolving each condition. If you are unable to resolve an error condition, please ask your Hitachi Data Systems representative for help, or call the Hitachi Data Systems Support Center for assistance. See section 4.2 for instructions on calling the Hitachi Data Systems Support Center.

Table 4.1 Troubleshooting

Error Condition	Recommended Action
Different class found for the same IP address during discovery	Delete leftover Unispace objects that belonged to a previous installation of the integration module. They will be located in the Unplaced Objects window of the Worldview 2-D Map.
Hitachi storage arrays are classified as generic HDS objects during AutoDiscovery.	Verify that Raid300Con and HDS_9900 World View™ classes have been defined. Open World View™ Class Browser and check for the existence of these classes under ManagedObject->Other_Devices->Hitachi_Device in the class hierarchy.
The HDSRaidAgt object is not discovered under the Raid300Con and HDS_9900 node classes when agent services are started.	Use awm_catch command to verify that the Distributed State Machine is polling the node where the agent exists: C:\> awm_catch POLL_EVENT ""

4.2 Calling the Support Center

If you need to call the Hitachi Data Systems Support Center, make sure to provide as much information about the problem as possible, including the circumstances surrounding the error or failure and the exact content of any error messages displayed on the host system(s). Please check the remote service information messages (R-SIMs) logged on the Remote Console PC, and note the reference codes and severity levels of the recent R-SIMs.

The worldwide Hitachi Data Systems Support Centers are:

- Hitachi Data Systems North America/Latin America
San Diego, California, USA
1-800-348-4357
- Hitachi Data Systems Europe
Contact Hitachi Data Systems Local Support
- Hitachi Data Systems Asia Pacific
North Ryde, Australia
011-61-2-9325-3300

Acronyms and Abbreviations

DSM	distributed state machine
GUI	graphical user interface
MIB	management information base
SDK	software developer kit
SNMP	Simple Network Management Protocol

