



Remote Control Software
RCS™
Administration Guide

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About this Guide

Congratulations on selecting Compaq Remote Control Software (RCS) as your network printer management utility. RCS will support all types of network printers, including:

- New Compaq and DIGITAL branded printers. RCS will provide detailed support for the special printing features found in both brands of new printers.
- Legacy DIGITAL printers. RCS will provide basic support for this type of printer.
- Other printers on your network that support SNMP. RCS will provide generic support for this type of printer.

Intended Audience

Compaq Remote Control (RCS) software is intended for system administrators responsible for managing network printers that support SNMP in a TCP/IP network.

How to Use This Guide

Refer to the following table for a description of the chapters found in this guide.

How to Use this Guide

Read	To Learn About
Preface	General features of the Compaq Remote Control Software (RCS) Administration Guide, as well as the key product features that make up the Compaq Remote Control Software.
Chapter 1	Installing Compaq Remote Control Software.
Chapter 2	Using Compaq Remote Control Software for the first time.

How to Use this Guide

Read	To Learn About
Chapter 3	The ways to create and edit a network map.
Chapter 4	The procedures for managing your devices through Compaq Remote Control Software.
Chapter 5	Event monitoring.
Appendix A	The Compaq and DIGITAL printers supported by Remote Control Software.
Appendix B	The definitions for Compaq Remote Control Software terminology, including those that are printer and network specific.
Appendix C	The TreeWalker Program.

Conventions

This guide uses the following conventions to emphasize certain information, such as user input and system output.

Conventions

Convention	Indicates	Example
Courier Bold	User Input	Show Clock
Courier	System Output	Please Wait...
<i>Italics</i>	<i>Book Titles, New Terms and Emphasized Text. Also Directories, Pathnames, and Filenames.</i>	<i>Refer to Chapter 2, Using RCS for the First Time.</i>
Boxes surrounding text	Notes, Warnings and Cautions.	See examples below.



Notes provides additional information or helpful suggestions that may apply to the subject text.

Customer Support

Compaq offers several sources of help and information. These include:

- Your Compaq Vendor
- The Internet
- Compaq Technical Support

Your Compaq Vendor

Your local Compaq vendor from whom you purchased this product may be best equipped to help you. Your vendor has specially trained service technicians available to answer questions and the equipment to analyze your problems.

The Internet

The Compaq website provides access to technical reports, new product announcements, and other general information about Compaq. You can access the Compaq website through any one of the many world-wide web browsers.

The Compaq website is at <http://www.compaq.com/showroom>. From the 'showroom', go to Enterprise Printers.

For specific information on printer and printing software (e.g., printer products, software and drivers, accessories, supplies, etc.), go to the following website: <http://www.printers.digital.com>.

Compaq Technical Support

Compaq Technical Support is available world-wide. Please refer to your Compaq Printer Service and Support Information Guide found in the SERVICE folder of the CD-ROM that accompanied your printer for the appropriate phone number in your area. When calling Compaq for assistance, please have the following information readily available:

- Your phone number, fax number and shipping address.
- A description of the problem.
- Your RCS Version #. This number is available from the RCS Main Window, by opening the Help pull-down Menu, and selecting About Remote Control Software.
- The serial number of a Compaq/Digital printer you are trying to manage.

RCS Features

Compaq Remote Control Software provides the following key features:

- Discovery
- Mapping
- Remote Configuration
- Event Monitoring & Logging
- Application Launching

Discovery

RCS will query your TCP/IP network to find the printers to be managed. Once a printer (agent) is found, it will be identified by RCS, causing an icon representing the device to appear, complete with a title, on a map. Additional symbols representing the state and features of the printer are automatically added to its icons.

Mapping

Mapping lets you design graphical representations of your network. Upon recognizing the printers that are to be on the same part of the network, RCS can automatically cable them together.

With the Mapping feature, you can create more than one type of graphical representation of a network. You can also tailor the map to arrange a screen layout of your facility.

Remote Configuration

RCS provides a property page for each discovered device. A property page contains information about the device, including its status. You can use a property page to remotely manage the printer. For example, a system administrator can remotely alter the media and tray settings of a printer. The level of remote configuration available will vary, depending on the printer model.

Event Monitoring & Logging

RCS has extensive device monitoring capabilities that can log to a file, configure sound and send email alerts notifying the system manager of printer events. Logging and graph abilities are available to record hardware performance.

Application Launching

RCS does not need to be shutdown in order to run other external applications. For example, you can launch a browser or use FTP to download a new version of printer code all while RCS continues to run.

Installing Compaq Remote Control Software

This chapter describes how to install Compaq Remote Control Software (RCS). It also provides the installation prerequisites necessary for running RCS.

Installation Prerequisites

Before you install RCS, check that your system meets the following software prerequisites:

- Microsoft Windows NT 4.0 with Service Pack 3 minimum or Microsoft Windows 95/98 is running on the PC receiving the RCS installation.
- TCP/IP is running on the network where the printers are to be managed.
- A valid IP address has been assigned.
- There is a minimum of 16MB free disk space on the application drive, with an additional 16 MB on your temporary drive during installation.

Installation Overview

Compaq Remote Control Software (RCS) is available on CD-ROM, as well as from Compaq's web-site at <http://www.compaq.com/showroom>. From the 'showroom', go to Enterprise Printers.



Remember to restart your system once the RCS installation process is complete.

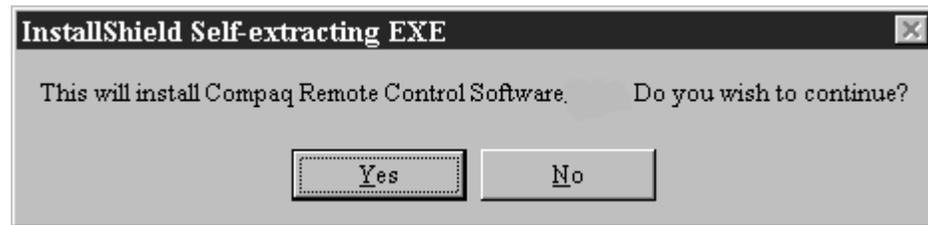
Running the Compaq RCS Set-up Program

1. Insert the Compaq Remote Control Software CD into the CD drive on the PC that is to receive the installation. If the application does not start automatically, double-click on the CD's icon in "My Computer".

The following screen appears:



2. Click **View Readme** to view the contents of the Readme file before proceeding with the installation.
3. Click **Install RCS**. The following message appears:



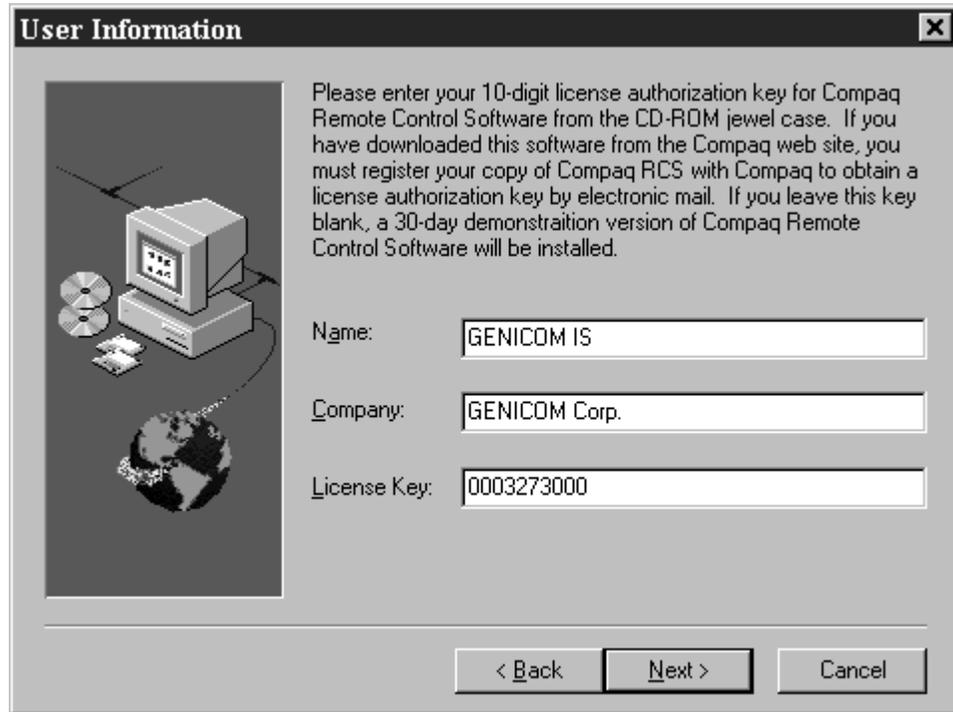
4. Click **Yes** to continue with the installation. The InstallShield Self-extracting Exe dialog box appears, and begins to extract the files which will install the application.

Once InstallShield extracts the files, the Compaq RCS Setup dialog box appears:



5. Click **Next** to continue the Setup Program.

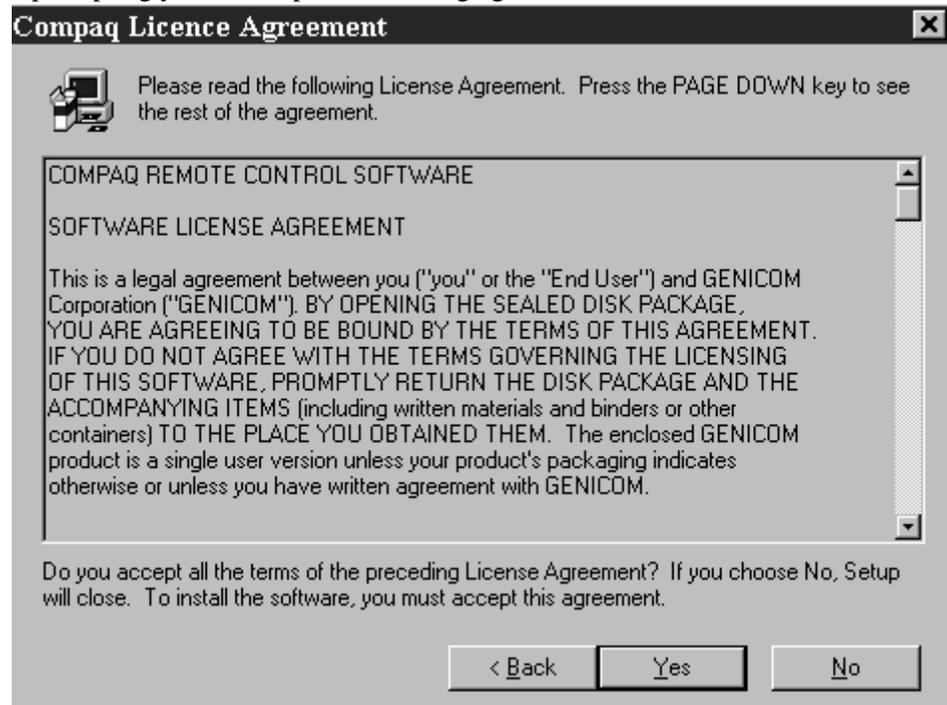
The User Information dialog box appears, prompting you to enter your name, company and license number for the Compaq RCS.



The Compaq RCS license number is located on the back-side of the CD case. You can also obtain this number through our website at <http://www.printers.digital.com>, or through Compaq's website: at <http://www.compaq.com/showroom>. From the 'showroom', go to Enterprise Printers.

6. Enter the requested User information. Click **Next**.

The Setup program displays the Software License Agreement dialog box, prompting you to accept the licensing agreement.



Click **Yes** to accept the license agreement, and to continue the Setup Program.

The Select Destination Directory dialog box appears, prompting you to provide the location for its destination folder.



The default location is `x:\Program Files\Compaq\Compaq Remote Control Software`.

Where X is the installation drive for Windows.

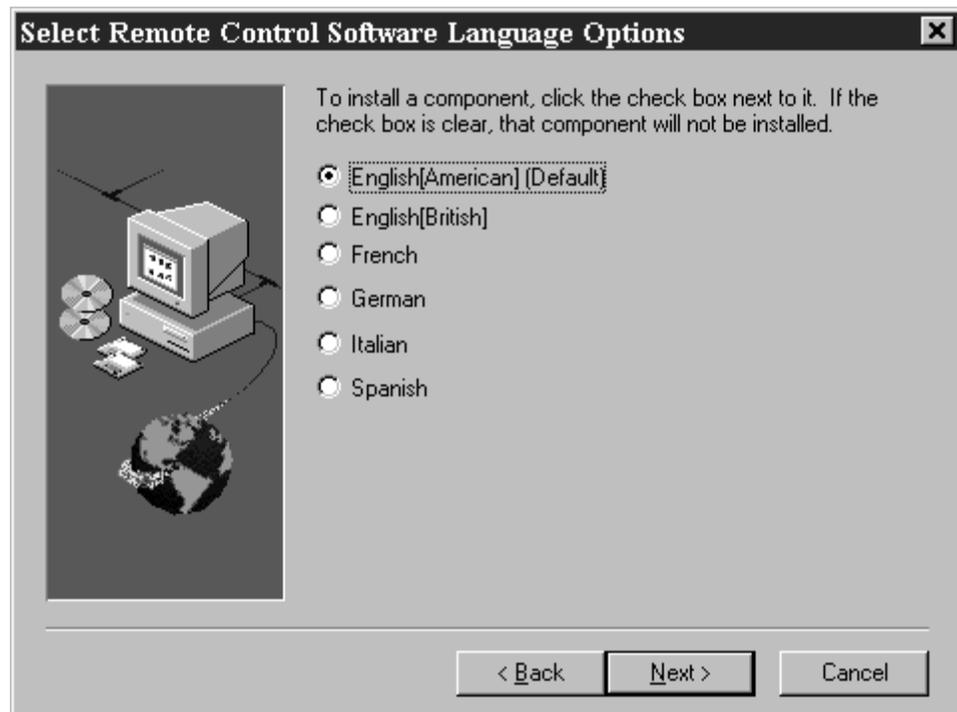
7. Click **Next** to accept the default destination directory, or **Browse** to install RCS in a different directory.

The Installation Choices dialog box appears:



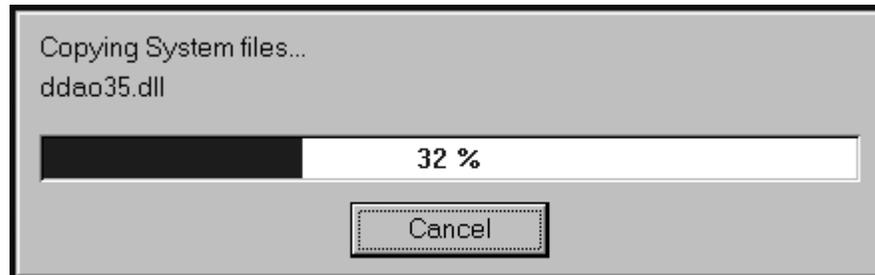
8. Click **Next** to install the option(s) appearing in the dialog box.

The Select Remote Control Software Language Options dialog box appears.



9. Click the check box next to the language option that you want RCS to use. Click **Next**.

The RCS installation begins. The Setup program displays a status box showing the installation progress.



The Setup program copies the Compaq RCS files to the location(s) specified. When it completes, the Setup Complete dialog box appears:



10. Select the option you want from the Setup Complete dialog box. Click **Finish** to complete Setup.

Uninstalling RCS

To uninstall RCS, follow the instructions below:

1. From the **Start Menu**, select **Programs**, then select **Compaq Remote Control Software**.

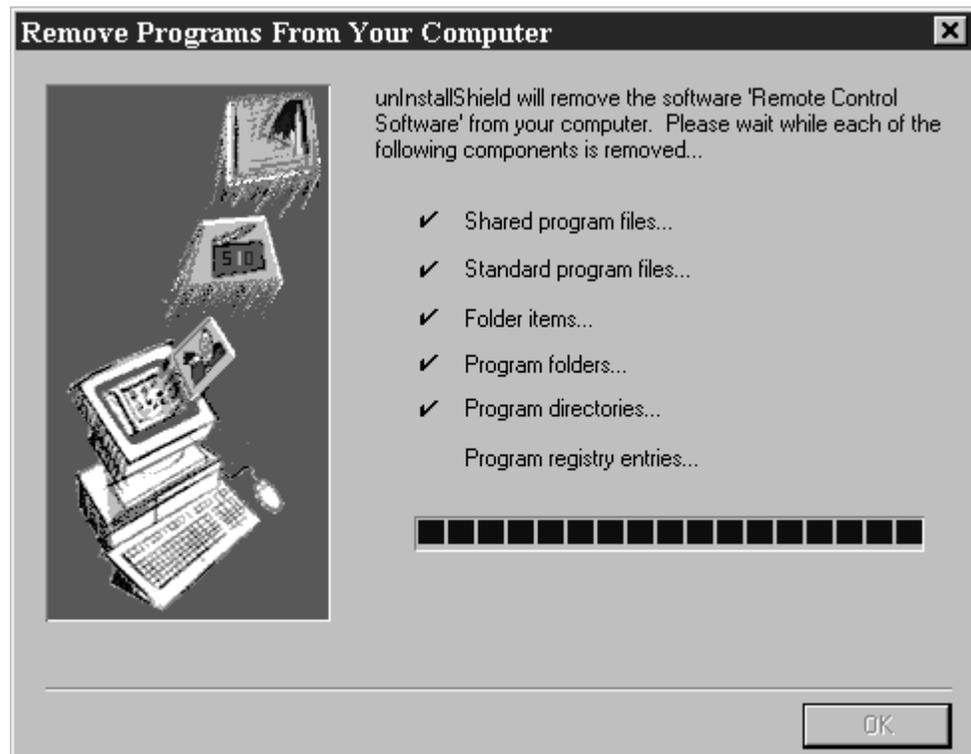
There are three options: Remote Control Software, SNMP Tree Walker and Uninstall Remote Control Software.

2. Select Uninstall Remote Control Software. The following message appears:



3. a. Click **Yes** to completely remove RCS and all of its components from your system. Click **OK** once the process has completed.

The Uninstall Shield application begins to remove the RCS application.



- b. Click **No** if you do not want to uninstall RCS from your system. The window will close, returning you to the most recently used application.

2

Configuring RCS for the First Time

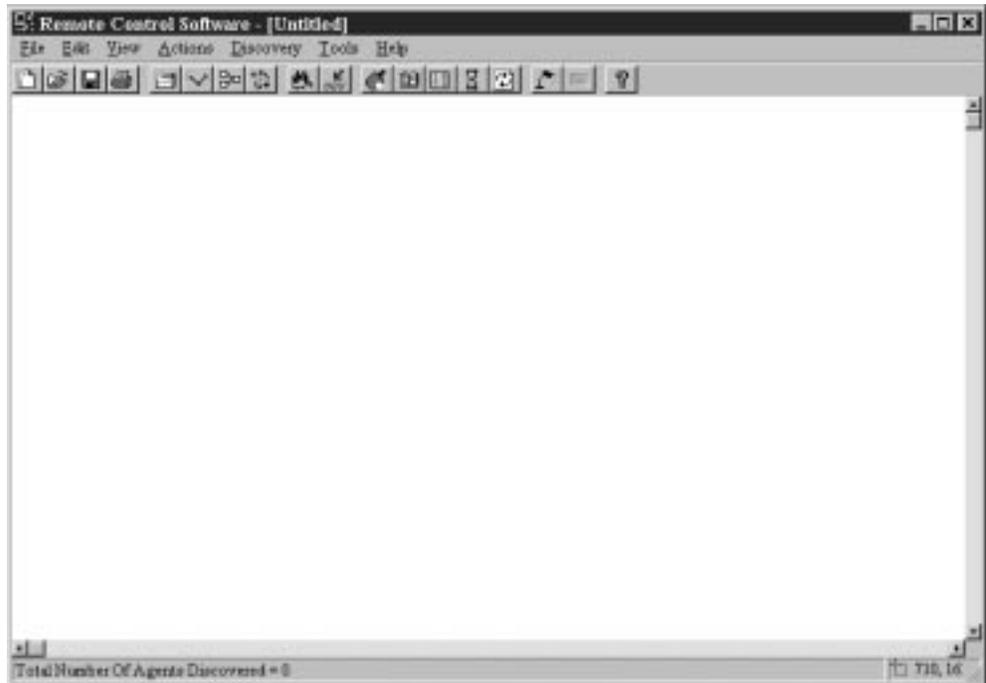
This chapter contains information that will help you to configure RCS for the first time. It begins by introducing you to the Map Screen. The Map Screen is where you will create and edit the device maps. It also provides instructions on how to discover the TCP/IP addresses for the devices by displaying a DNS Host List.

Other useful information in this chapter includes instructions on how to configure discovery settings, create security profiles, and set-up event logs.

Starting RCS

When you run RCS for the first time, it will open to a blank window. Your first task is to discover the TCP/IP address for each device that RCS is going to manage on the network.

RCS Map Screen



Discovering Device IP Addresses

In order for RCS to manage the devices on your network, it must be able to locate them through their individual TCP/IP addresses. You can accomplish this task directly from the RCS Map Screen. Instructions are as follows:

1. From the **RCS Map Screen**, open the **Discovery** Pull-down Menu and select **Ping**, or press the **Ping** button on the **Button Bar**.

The following window appears:



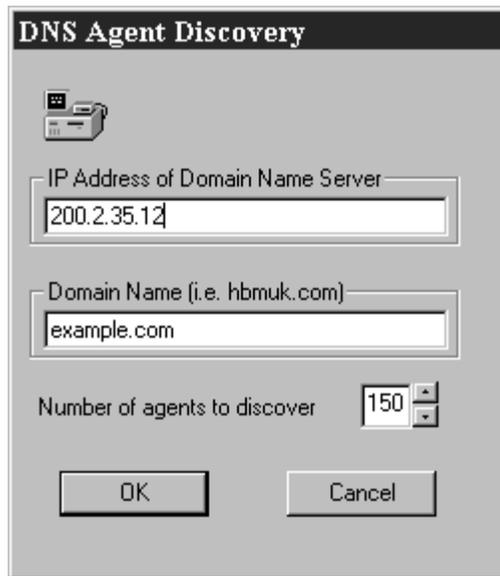
2. Enter the IP Address for each device that RCS is going to manage on your network. There are three ways to ping an IP Address. You can:
 - Enter a single IP Address (e.g., 199.2.21.222).
 - Enter a complete subnet of IP Addresses (e.g., 199.2.21.*).
 - Enter a range of IP Addresses (e.g., 199.2.21.5,10-50,222)
3. Click **Add**. The IP Address(es) will appear in the lower window.
4. Click **OK** to start the discovery process.

Displaying a DNS Host List

To review a list of device IP addresses currently on your Domain Name Service Server, follow the instructions below:

1. From the **RCS Map Screen**, open the **Discovery** Pull-down Menu and select **Search DNS**, or press the **DNS** button on the **Button Bar**.

The following window appears:



2. Enter the IP address of the DNS Server. Press the **TAB** key to advance to the Domain Name field.
3. Enter the domain name of the DNS Server.
4. Press **OK** to start the discovery process.

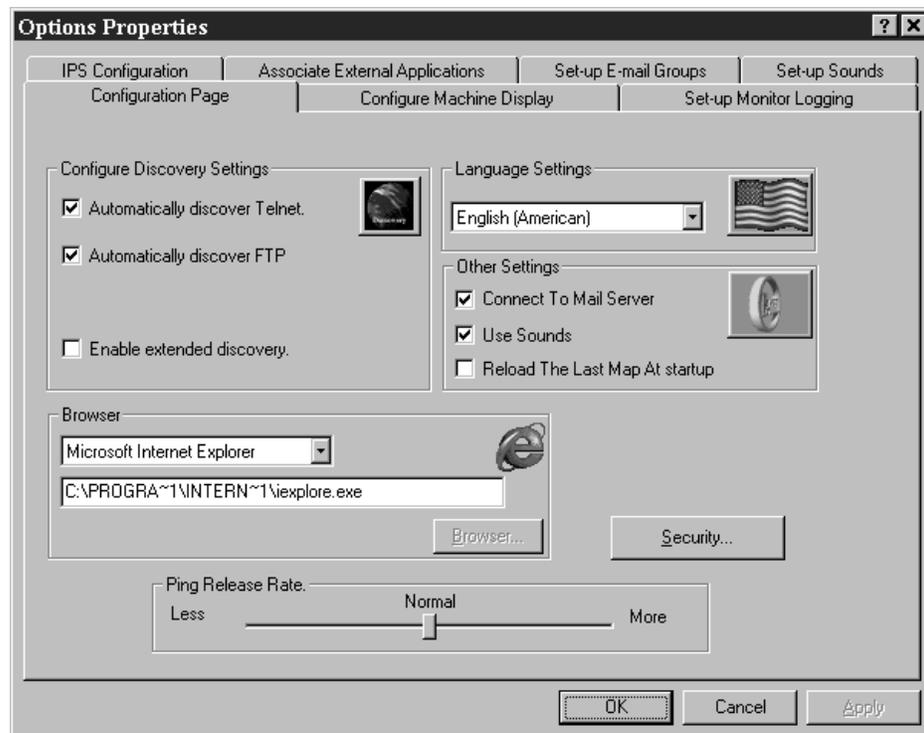
Configuring Discovery Settings

These settings allow you to designate which of the two available options-Telnet or RCS to automatically discover.

The third option-**Enable Extended Discovery**-can be useful if you are trying to discover an entire network. When this option is selected, for each new device with SNMP that Remote Control Software (RCS™) discovers, that device's ARP Table is interrogated to find further addresses to be interrogated. This will often result in extra devices being displayed on the Map Screen, including devices that were not actually requested in the original search criteria.

To configure the discovery settings for RCS, follow the instructions below:

1. From the **RCS Map Screen**, open the **Tools Pull-down Menu** and select **Options**.
2. From the **Configuration Page Tab**, click the Discovery Setting(s) for RCS. There are three: Telnet, FTP and Enable extended discovery.



3. Click **OK**.

Configuring Event Monitoring

RCS generates a variety of informational messages that can either be logged to a file, sent to an Email address, or both. In addition, you can elect to attach an audible alarm on specific types of messages, based on severity.

Setting-up a Log File

A default log file has already been set-up for you in:

```
X:\PROGRAM FILES\COMPAQ\COMPAQ REMOTE CONTROL SOFTWARE\Logs\Monitorlog.log
```

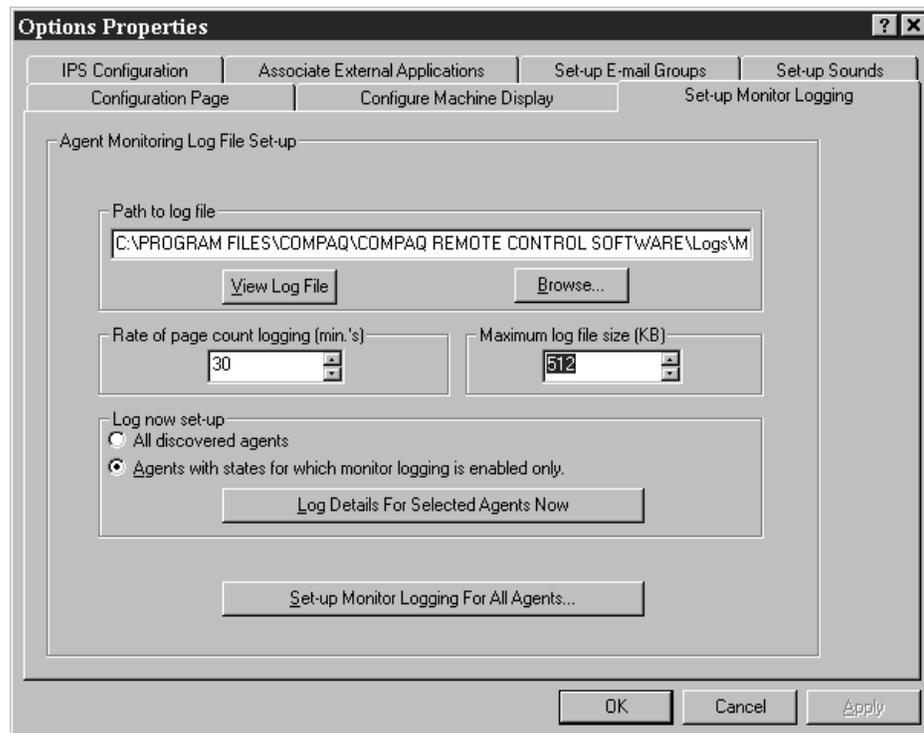
where X: is the installation drive for RCS.

You have the option of using the default log file to store messages, or you can select another path to a different log file.

To send messages to a different log file, follow the instructions below:

1. From the **RCS Map Screen**, open the **Tools** Pull-down Menu and select **Options**.
2. Select the **Set-up Monitor Logging** Tab.

The following window appears:



3. Click the **Browse** button under the Path to log file section.
4. Navigate to the path maintaining the new log file and click **Open**.

The Set-up Monitor Logging window appears, displaying the new path and log file in the `Log to file` field.

5. Click **OK** to update RCS with the new log file.

Logging Current Printer States

You can generate a log file containing the current state of each printer on the network from the Set-up Monitor Logging Tab. This file, which is generated in a text format, can easily be brought into any word processing application for editing/formatting purposes.

Refer to *Chapter 5, Setup Monitor Logging Page* for instructions on how to accomplish this task.

Setting Agent Global Options

The Setup Monitor Logging for All Agents option on the Set-up Monitor Logging Tab lets you globally select the various agent states that you want RCS to log during normal operation. In addition to setting global logging states for the Agents on your network, RCS also lets you set logging states for individual agents.

For additional information on how to accomplish both tasks, refer to *Chapter 5, Setup Monitor Logging Page*.

Globally Attaching Audio Alerts to Agent States

Because all messages differ in levels of severity, RCS gives you the ability to globally, as well as individually, attach an audio alert to agent states that are determined as critical.

Refer to *Chapter 5, Setup Monitor Logging Page* to find out how to attach audio alerts to the various agent states.

Setting Up Email Groups

A copy of Microsoft Exchange or Outlook must be resident on your system before you can set-up Email groups to receive event notifications. In addition, you must also configure RCS to connect to the Mail Server.

Refer to *Chapter 5, Setup Email Groups Page* for instructions on how to accomplish this task.



4. From the **Access Level** Pull-down Menu, select the security level that you want to configure. There are three **User**, **Operator**, and **Administrator**.
5. From the **Username** field, enter a unique username for the individual receiving the security level.
6. From the **Password** field, enter a password for the user. Advance the cursor the **Confirm Password** field, and re-enter the password.
7. If you want the user to change the password at startup, click the Tick box next to the **Change Password at Startup** field.

Defining User Access Levels

There are three access levels: User, Operator, and Administrator. RCS lets you determine how much access you want to assign each access level. It also lets you set-up new access levels that you define. Refer to the *Chapter 5, Configuration Page* for additional information on how to define user access levels.

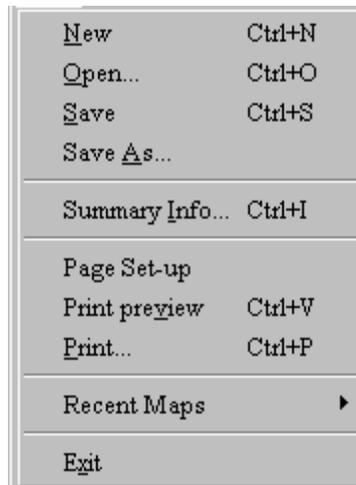
Menu Options

In addition to popup menus and tool bar buttons, RCS also has a series of pull-down menus which are found at the top of the Map Screen. Click on a menu title to see the options available for each menu.



Some of the menu functions can also be accessed through the toolbar buttons and are described throughout this guide.

File Menu Options



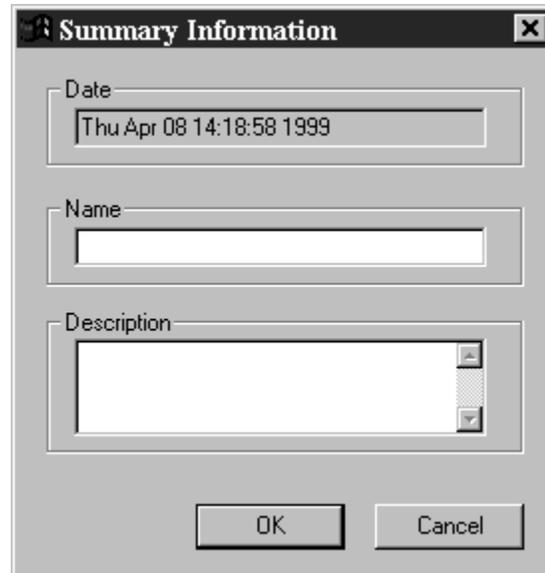
New: Creates a new map screen.

Open: Opens a previously saved map screen from disk.

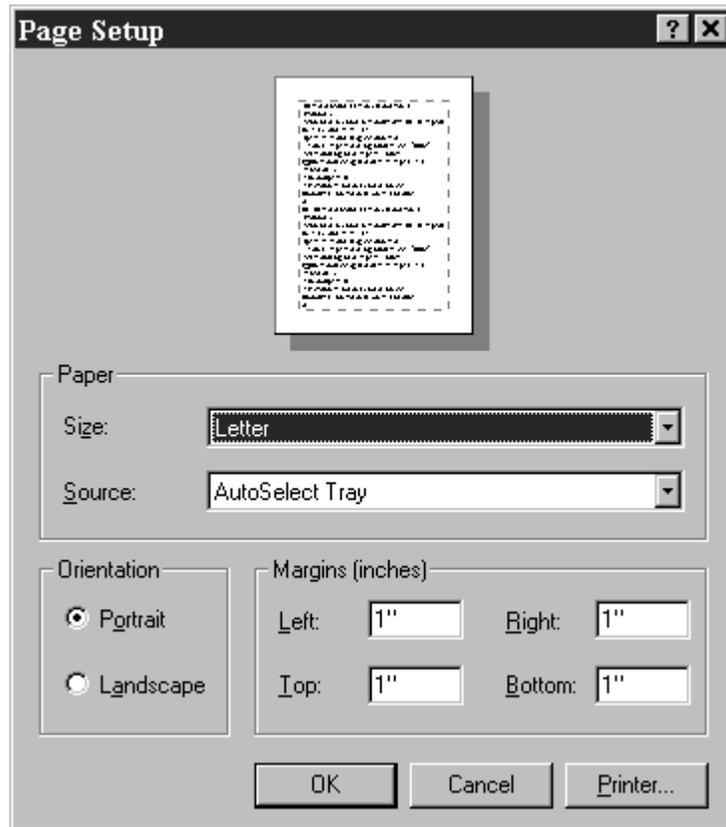
Save: Saves the current map screen to disk (RCS) saves its map screens as *.mdb Microsoft Access database files).

Save As: Saves the current map screen to disk under a new filename that you specify.

Summary Info: This option allows you to enter summary information about the selected map. Choosing this option opens the **Summary Information** dialog box as shown below:.



Page Setup: This allows you to see and manipulate an on--screen representation of the printed page. Selecting this option opens the dialog box shown below:



You can set **Paper Size** and **Source**, paper **Orientation**, and **Margins**. Selecting the **Printer** button allows you to review the default printer information.

Print Preview: This option displays an on-screen representation of what the printed page will look like.

Print: This option prints the currently displayed map.

Recent Maps: Selecting this option displays a list of the maps you've most recently created in this program. To quickly reopen one of these maps, click on the map name.

Edit Menu Options



Delete: This option deletes the currently selected agent from the RCS Map Screen.

Find: This option activates a search routine that helps you to find desired devices from the map screen. When selected, the **Find Agents** dialog box appears.

Set the parameters for your search as follows:

Search on Select the data field to search (Icon title, Host name, Hardware address or IP address).

Enter the details of the agent to find: Type in the numbers, letters or special characters of a string to search for.

Clear Existing Highlights: Select this button to remove all highlights from the previous searches. Selecting this button will not delete any of the highlighted information - it simply removes the highlighting used to identify information matching the search criteria.

Refresh highlights before search: Select this option to have all highlights from previous searches cleared before beginning a new search.

Case Sensitive: Select this option to search for only the indicated case of letters (capitalized or not).

View Menu Options

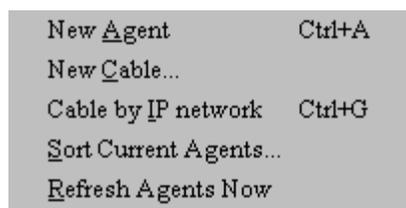


Graphs: Choosing this option will take you into the **Graph Wizard**. To create a graph, follow the step-by-step instructions as explained in the Graph Wizard (see Chapter 4 for further details).

Log File: When you select this option, the **Log File Viewer** will appear on your screen. This automatically keeps track of network activity and logs “events” that have occurred on the network. To leave the Log File Viewer, select **Close**.

Toolbar: Choosing this option causes a popup menu to appear with a list of options for toolbar appearance. You can choose either **Large** or **Small Icons** for the RCS Toolbar. You can also hide the Toolbar by choosing **No Toolbar**.

Actions Menu Options



New Agent: Use this option to create a new agent icon, as follows:

1. Click on **New Agent**. The mouse pointer will appear as a cross when it is positioned over the map screen.
2. Left-click in the map screen to open the **Agent Property Pages** dialog box. Setup the properties for the new agent as you require.

New Cable: Use this option to create a new cable icon (See Chapter 5 for further details).

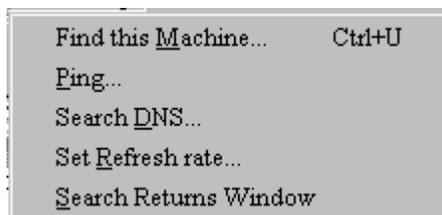
Cable by IP Network: This option activates automatic cabling of agent icons, according to the networks they belong to.

Sort Current Agents: Selecting this option opens the **Arrange Icons** dialog box, which has two options for arranging devices on the map screen.

1. **Arrange IP address:** This option sorts device icons in sequence from left-to-right and top-to-bottom by their IP addresses. All current cabling will be recabled and the color of cables may change.
2. **Arrange by cable node:** This option sorts all device icons on the map screen by their network nodes, arranging them from top-to-bottom (following a repeating pattern of left-to-right and then right-to-left). current cabling will be recabled and the cable color may change.

Refresh Agents Now: This option allows RCS to instantly update the status of all devices on the network. Refresh Agents Now does not discover new devices - it checks devices already discovered to see if they are still ‘alive’ on the network. For more information on refreshing agents, see the topic **Set Refresh Rate** in the **Discovery** menu topic.

Discovery Menu Option



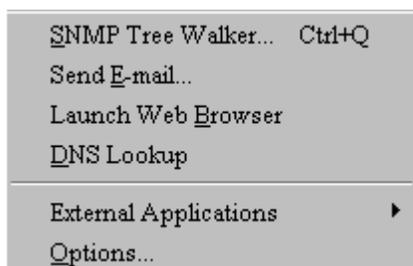
Find this Machine: This option autodiscovers your computer, opening the **Locatehome PC** dialog box.

Search DNS: This option autodiscovers all agents using the DNS. When selected, the **DNS Agent Discovery** dialog box is accessed.

Set Refresh Rate: This option sets the frequency for updating the status of all agents on the network. This option does not discover new devices - it simply checks devices already discovered to see if they are still 'alive' on the network.

Search Returns Window: This option displays the results and gives feedback on your latest search for agents on a network.

Tools Menu Options



SNMP Tree Walker: This option starts the SNMP Tree Walker, a separate application that enhances the functionality of RCS. Multiple executions of the SNMP Tree Walker can be run simultaneously to monitor different SNMP Trees, or networks (for more information, see Appendix C).

Send Email: This option launches an email application, if one is installed. You must provide the email application which is not included in RCS. RCS simply has the ability to start such applications.

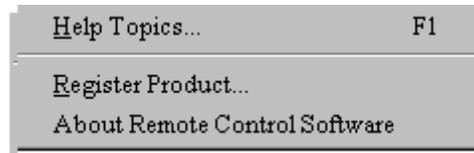
Launch Web Browser: This option launches an Internet Web browser, if one is installed. You must provide the web browser application which is not included in RCS. RCS simply has the ability to start such applications.

DNS Lookup: This option determines IP addresses and host names (or text domain names). This is not the same function as **Search DNS** described under the Discover Menu.

External Applications: Select this to see a list of applications for managing specific types of printers available for your use. Refer to Chapter 5 to find out how to add other external applications to this list.

Options: This option opens **RCS Options Properties** pages. For further details see Chapter 4.

Help Menu Options



Help Topics: This option displays the Help Contents page for RCS.

Register Product: This option displays the Product Authorization and License Transfer dialog box.

About RCS: This option displays the program information for RCS.

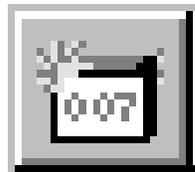
What's Next?

Now that you have discovered and arranged the devices on your network, you may wish to cable them and store them as different maps. *Chapter 4, Managing the Discovered Devices* will describe how you can manipulate and maintain your devices.

3

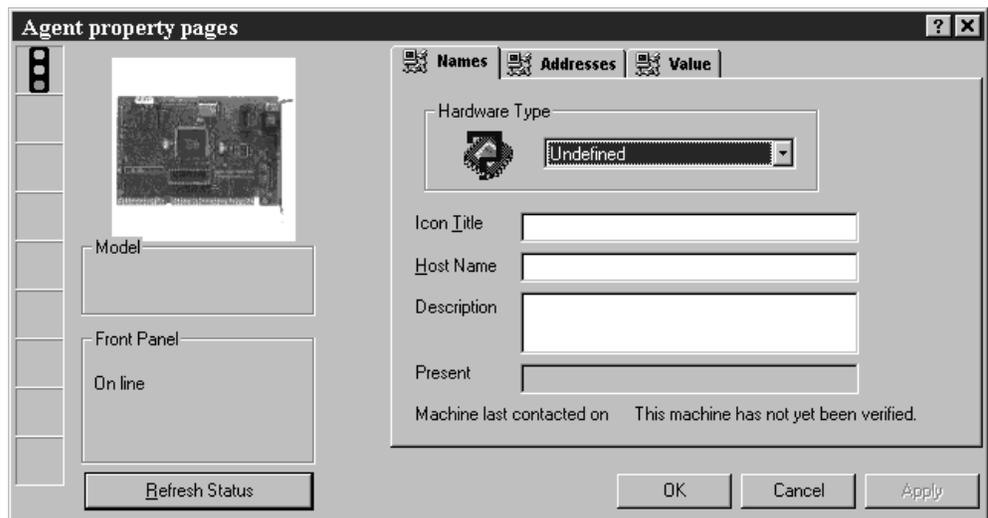
Creating and Editing Your Network Map

Having discovered all agents you can now create a network map. A set of icons on the tool bar at the top of your screen will enable you to design your screen layout and explore the cabling facilities.

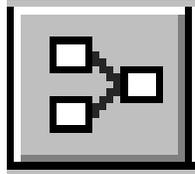


New Agent

The New Agent toolbar button allows you to add agents that have not been autodiscovered. When this option is selected, the cursor will change to a cross cursor for positioning. A single click will locate the agent on the map and display an empty property page (shown below) for specifying the agent's details.

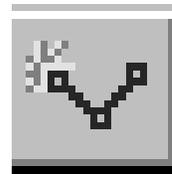
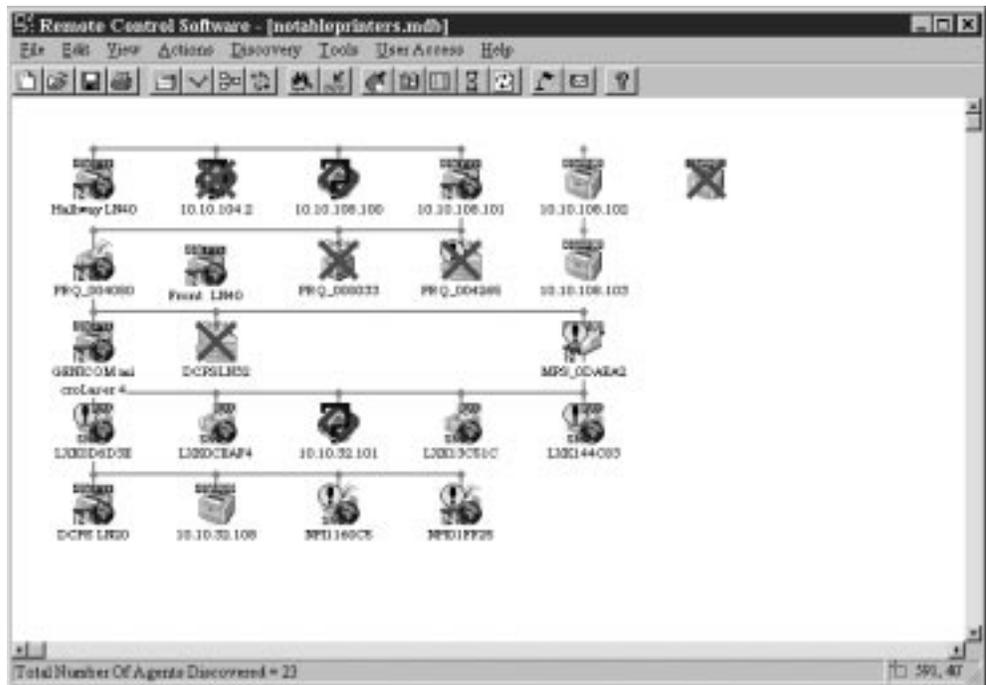


The type of machine can be selected from the **Hardware Type** drop down box. Clicking on the tabs at the top of the page allows you to enter both **Names** and **Addresses** for the machine.



AutoCable

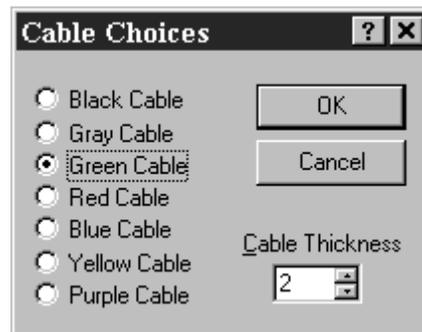
Once all network agents have been discovered, the AutoCable option allows you to automatically cable up the discovered devices. When you click on the AutoCable button the program connects the agent icons via color coded lines. Machines that are on the same IP sub-network are tied together and the cables are labelled accordingly. The following is an example of an autocabled network map.



New Cable

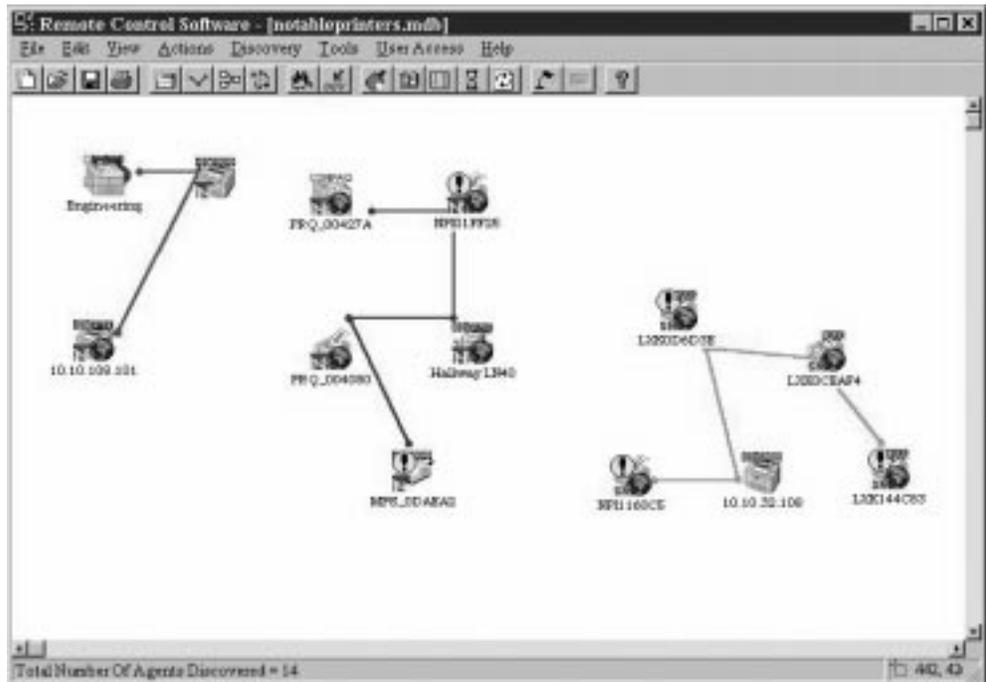
This facility enables you to organize your autocabled map and add new cables by following the steps below:

-
1. Click on the **New Cable** button to open a dialog box for choosing the cable color and thickness (see next page).
 2. Once color and thickness have been set, press **OK**. The cursor changes to a cross cursor.
 3. To choose a starting point for the cable, click the left mouse button on an appropriate point on the map screen.
 4. Each subsequent click of the mouse will designate a corner of the cable.
 5. Double click to secure the cable and end point (i.e., stop the cabling).



You can use these RCS features to design a map of your network, as shown in the example below:

1. Click on and drag each agent icon to move it to a specific position on the network map screen.
2. Use the cabling functions to construct a network.
3. To affix each agent icon to the appropriate cable, right click on the agent. From the displayed menu, select **Attach Agent**.
4. To detach, follow the same procedure, but select **Detach Agent**.



Additional Editorial Facilities

Delete Agent: Select an agent and press **Delete** or right click on an agent and from the popup menu, select **Delete Agent**.

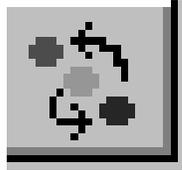
Cable Popup Menu: Right clicking the mouse on a cable will bring up this menu:



You can use the popup menu options to delete cables and nodes as required. Select **Hide Network** to reduce the network that includes the selected cable to an icon on the map screen. This can be useful when dealing with large networks.

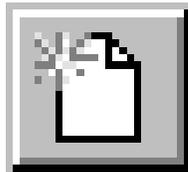
Print Preview: Select this from the **File** menu to view your newly designed map. You can choose to print your map in either **Landscape** or **Portrait** format.

Additional Toolbar Options



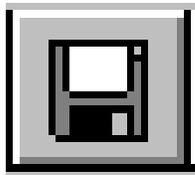
Sort Current Agents

This option sorts agents displayed on the RCS in IP Address order.



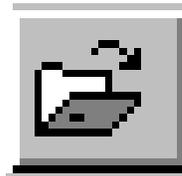
New Map Screen

This tool bar button resets the map screen, deleting and clearing the existing screen.



Save

Once you have discovered your network environment, selecting this toolbar option allows you to save the map.



Open

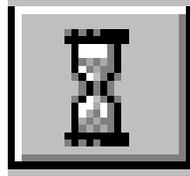
Select this option to access the map again.



Print

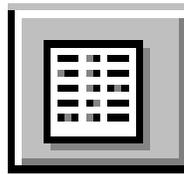
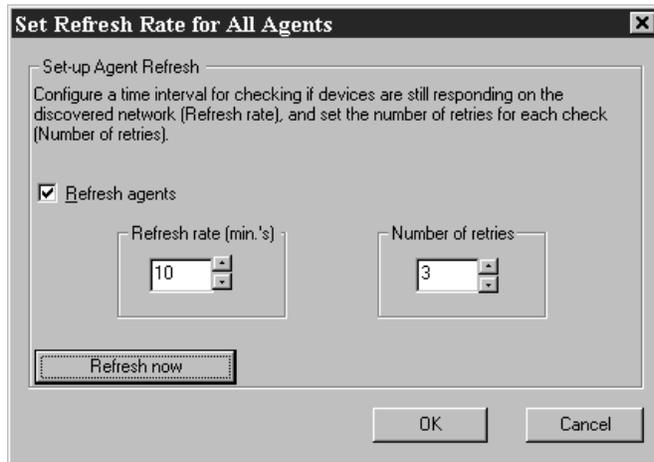
Choose this option to print the discovered map displayed on the screen.

FRQ_004080



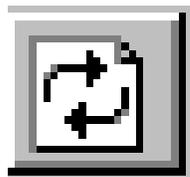
Set Refresh Rate

Select this option to adjust the rate at which RCS updates the status of currently discovered agents. The following box will appear, where you can change the **Refresh Rate**. You can also set the number of times RCS will attempt to contact a printer before declaring it unavailable. If you don't want the currently discovered agents to be updated, deselect of the **Refresh Agents** box.



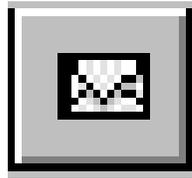
Search Returns

After using the Ping Locator, Locator, or Search DNS functions, select this button to see a window showing the search results. For example, after a multiple Ping, the Search Returns window will display a list of the pinged IP addresses. For each Ping, you will be told whether it was successful and whether the device was located.

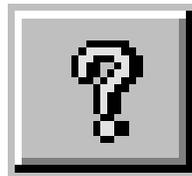


Refresh All Agents

Click on this button to refresh the status of all the discovered agents on the map.

**Send E-Mail**

Enables you to send mail within RCS without the need to change windows (this facility can be turned on and off by selecting **Options** from the **Tools** menu at the top of the map screen and selecting the **Configuration property** page. Under **Other Settings** select **Connect to Mailserver** choosing on/off as required).

**Help Topics**

This toolbar button provides instant access to help pages and registration information.

Toolbar Settings

To configure the toolbar settings:

1. From the **View** menu at the top of the map screen, click on **Toolbar**.
2. Click on **Small Icons** or **Large Icons** or **No Toolbar**. The last option removes the toolbar from the screen completely (the default setting is **Small Icon**).

4

Managing the Discovered Devices

In Chapter 2, you were introduced to the procedures for using RCS for the first time. In particular, you were shown two ways to discover the printers residing on your network. Chapter 3 discusses how to save the information into a map file.

Chapter 4 provides information that is useful once the printers have been discovered and mapped. In this chapter, you will learn how to interrogate and remotely manage the printers.

Before You Begin

When you first open RCS, the map screen will be empty, unless you specify otherwise in the Configuration Page. For more information on how to setup this option, refer to *Configuration Page found in Chapter 5* of this guide.

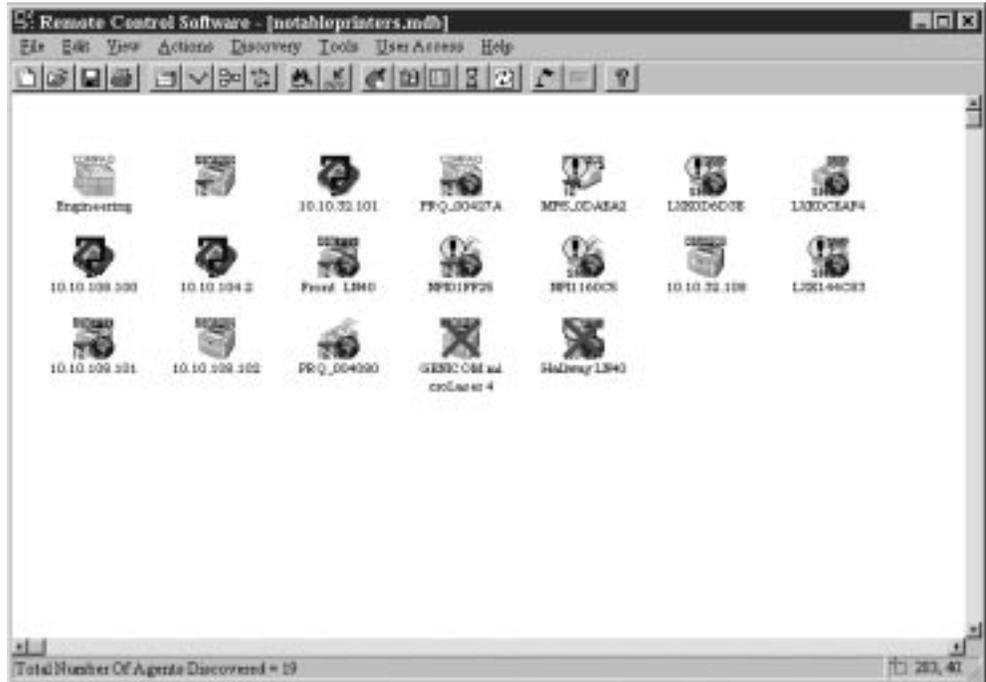
To open a map, select **File > Recent Maps**. Then select the map that you want to work with from the list shown. Another way to access a different map file would be to select **File > Open**.

Printer Icons

Compaq Remote Control Software uses different icons and property pages to alert the administrator of a printer problem, as well as to manage and configure the printers. The icons provide a visual representation of the type of printer and its global status.

Each icon on the RCS Map Screen represents a particular printer, or agent. RCS will identify the printer's type, and assign a corresponding icon to it.

To view the icons, open one of your saved maps. An example of a saved map appears below:

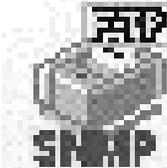
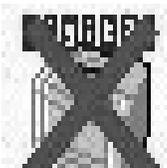
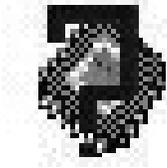


Printer Icon Symbols

Symbols appearing on the icons provide information regarding the functionality and status of the printer. This information is refreshed on a regular basis. The default refresh rate is set to 10 minutes.

A description of each symbol that could appear within a printer icon is as follows:

Printer Icon Symbols

Icon	Description
	Identifies a printer with File Transfer Protocol (FTP) accessibility.
	Identifies a printer with HTML abilities, enabling it to be interrogated using a web browser.
	Indicates the printer is not responding. When the machine goes back onto the network, the red cross will disappear.
	Indicates a network device that is not a printer.

Printer Icon Symbols

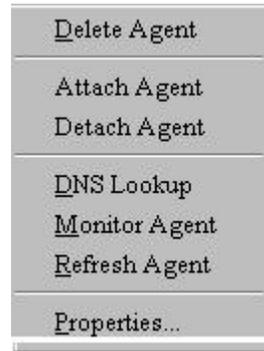
Icon	Description
 <p>PRQ_004080</p>	<p>Indicates that the printer is currently printing.</p>
 <p>SNMP</p>	<p>Indicates a printer error. For example, the printer is out of paper. The Printer's properties page will describe this icon in more detail.</p>
	<p>Identifies a printer with TELNET accessibility</p>



Each of the above symbols can be turned-off, if desired. Refer to *Configure Machine Display Page*, found in Chapter 5 of this manual.

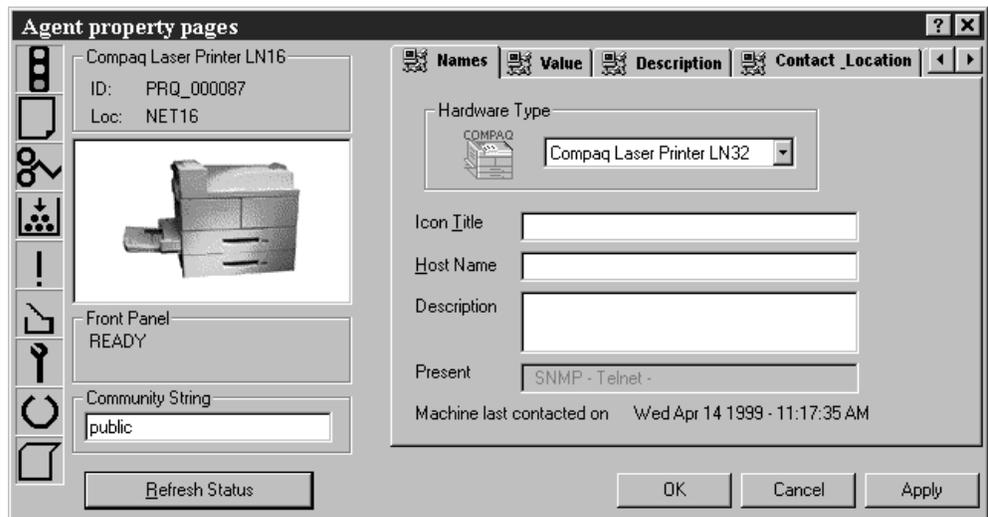
Property Pages

There are two ways to access the Property Pages for a printer. You can double-click on its icon, or you can right-click on its icon, and select Properties Pages from the drop-down menu.



Property Pages are useful for maintaining all types of information regarding the device. From these pages, you can change device settings such as its name, serial number, location, and paper trays.

The following is an example of Names Tab within the Property Pages.



Property Page Icons

There are nine icons found on the left side of each Property Page. As the state of the printer changes, its corresponding Property Page Icon will become highlighted. A description of each one is as follows:

Property Page Icons

Property Page Icon	Description
        	<p>Traffic Light Icon. Traffic Lights Available: Red - Unavailable; Amber - Alert; Green - Ready.</p> <p>Paper Out Icon. Printer is out of paper.</p> <p>Paper Jam Icon. Printer has a paper jam.</p> <p>Toner Icon. Toner Low/Out. Yellow - Low Toner; Red - No Toner; Black - OK.</p> <p>General Alert Icon. A general problem exists.</p> <p>Cover Open Icon. Printer cover is open.</p> <p>Wrench Icon. Service is needed.</p> <p>Offline Icon. Printer is currently warming up. The icon will turn red during warmup.</p> <p>Printing Icon. Printer is printing. The icon will turn green during print jobs.</p>

General Information

Each property page provides you with useful, general information about the device. Refer to the boxes on the left side of the Property Pages for the following types of information:

- Model name and printer.
- Printer ID and location (you can set-up this information from the Contact Location Tab).
- A bitmap of the specific printer model.
- The status of the printer. More information will be provided if one of the icons are lit, indicating a problem.
- The SNMP community string. The text box can be changed from the standard default of 'public' to a modified community name, in order to change the configuration of a device.



Located at the bottom of the status boxes is a Refresh Status button. Click this button whenever a printer status update is required.

Property Pages Descriptions

The right side of each property page contains information that is specific to the tab you select. There are a variety of tabs that could appear within the Property Pages. The tabs within the property pages are determined by the model of the printer. Basic tabs available for all printer models are: Name, Value, Description, and Contact Location. Additional tabs may be present, depending on the type of printer. You can scroll through the tabs by clicking on the right and left arrows located in the top, right corner of each page.

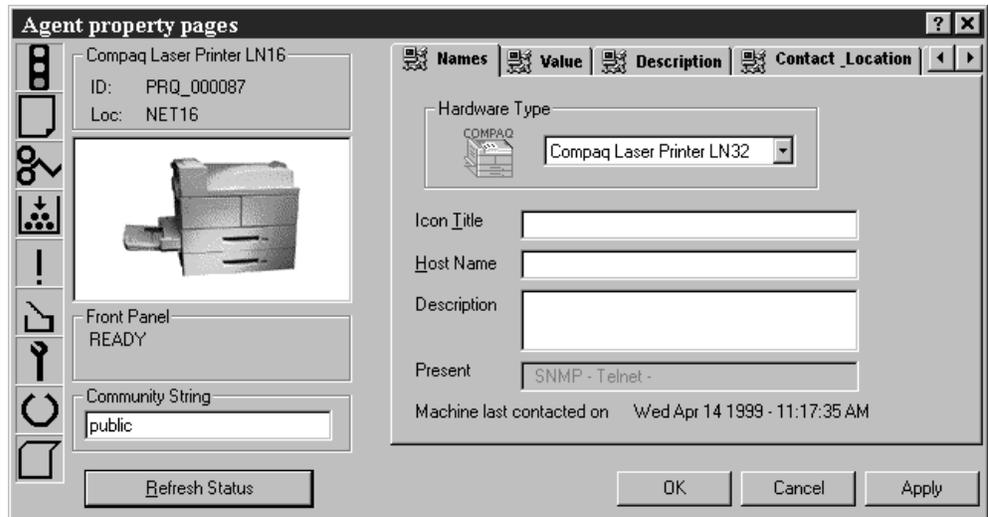
You can save changes to a property page in two ways: by clicking the **Apply** button to remain in the Property Pages; or by clicking **OK** to exit the Property Pages, once all of the changes have been made.

Basic Property Pages

There are four pages available for any model of printer. They are the Names, Value, Description and Contact Location Pages. A description of each one is as follows:

Names Page

Below is an example of the Names property page. This page is shown first when you open the device property pages for a printer.



Hardware Type: The printer or device hardware type will be displayed in this field. Next to this field is the printer device icon for the hardware type.

Normally, you do not need to change this field. However, if you are configuring agents by hand, you can change to a particular printer type by selecting from the drop-down list and choosing a printer mode. You should select **OK** and reopen the device property pages to see the changes made by the selection of a new device type.

Icon Title: The name of the device icon in the RCS map screen can be changed in this field.

Host Name: If this device was found through a DNS lookup, its host name will be entered here. You can leave this field empty for most printers if you do not name your printers on the TCP/IP network.

Description: You can use this field to provide additional information. This information is retained with the saved printer map. The field is empty by default.

Present: This field lists the protocols and services found on the device. These can include SNMP, FTP, Telnet, and HTTP.

Below the **Present** field is an indication of when RCS last contacted the device. You can use the **Refresh Status** button to update the device information.

*Press the **Apply** button to save changes without exiting *Device Properties* or press the **OK** button to save changes and exit.*

Value Page

The System Administrator can use the **Value** page to keep track of asset value, asset tag numbers, serial numbers, and other information. This is stored with the map database, which is in a Microsoft Access format so that other reports can be generated from it.

The screenshot shows the 'Agent property pages' dialog box with the 'Value' tab selected. The dialog is titled 'Agent property pages' and has a standard Windows window border with a question mark and close button in the top right corner. On the left side, there is a vertical toolbar with icons for various actions. The main area is divided into several sections:

- Device Information:** A box containing 'Compaq Laser Printer LN16', 'ID: PRQ_000087', and 'Loc: NET16'.
- Image:** A small image of a Compaq Laser Printer LN16.
- Status:** A box containing 'Front Panel READY'.
- Community String:** A text box containing 'public'.
- Refresh Status:** A button at the bottom left of the dialog.

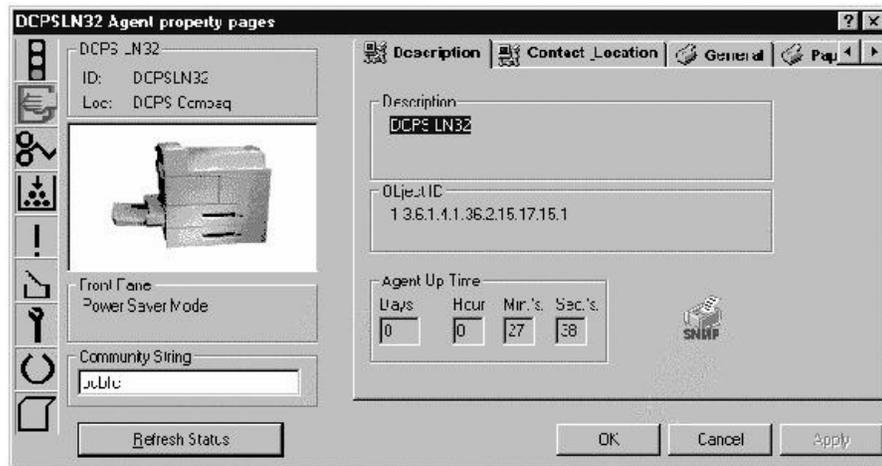
The right side of the dialog is a form with the following fields:

Names	Value	Description	Contact_Location
Asset Value	<input type="text"/>		
Asset Number	<input type="text"/>		
Book Value	<input type="text"/>		
Page Cost	<input type="text"/>		
Depreciation	<input type="text"/>		
Serial Number	<input type="text"/>		
Date Of Purchase	1 <input type="text"/> January <input type="text"/> 1999 <input type="text"/>		

At the bottom right of the dialog are three buttons: 'OK', 'Cancel', and 'Apply'.

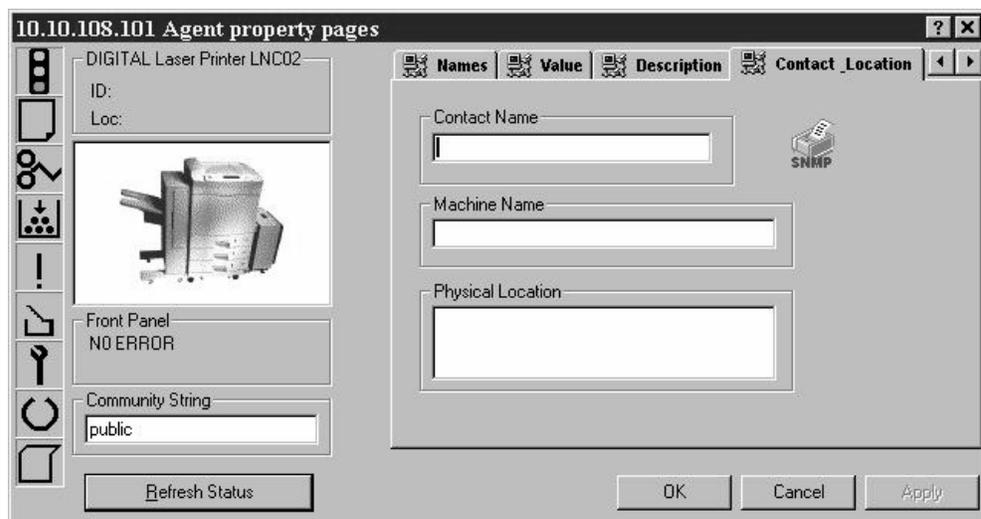
Description Page

The Description Page displays information from the Printer's MIB, identifying the printer's OID and the amount of time the printer has been powered on.



Contact Location Page

Contact Location shows standard SNMP contact information (Contact Name, Machine Name, Physical Location) and can be used by the system administrator as well as other SNMP programs. A change to these values will change the information on the left side of the property page. It will also update the information in the printer's MIB and the RCS display map.



General SNMP Pages

Additional printer information can be found on the SNMP pages. These pages are available for all recent Compaq and DIGITAL branded printers, as well as any non-Compaq and non-DIGITAL printers. The exact appearance and capability of these pages varies with each device.

Addresses Page

The Addresses Page shows the printer's network address information, including IP address and subnet mask. These can be modified by the system administrator.

General Page

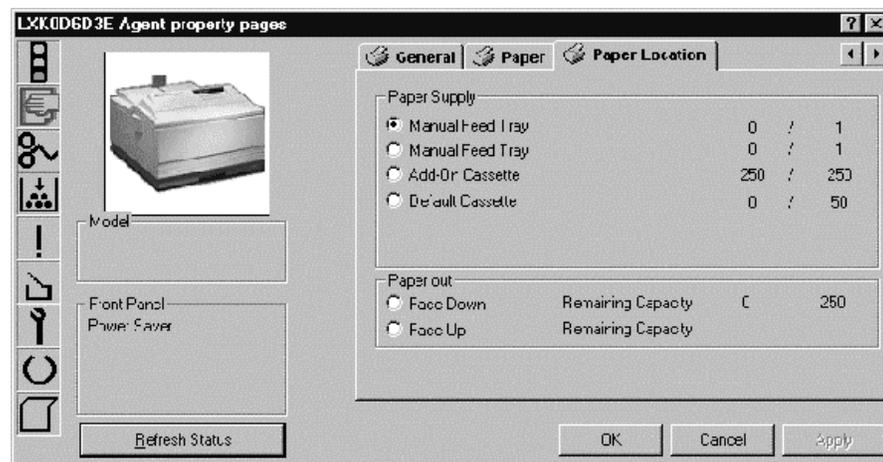
This page displays all the PDLs and protocols supported on that printer, as well as any international language supported by the front panel.

Paper Page

The Paper Page allows the system administrator to modify page orientation, and duplexing options. It also displays lifetime page count, and some information on input and output tray support.

Paper Location

This page shows the breakdown of input and output paper trays, and where possible, the current consumption level of each.

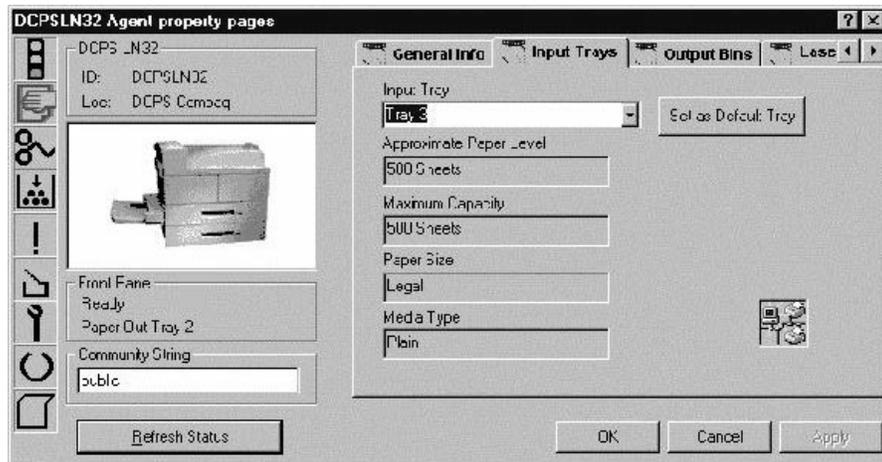


Enhanced Pages

Many Digital and Compaq branded products include pages with even more detailed status and remote configuration. Examples of these pages are:

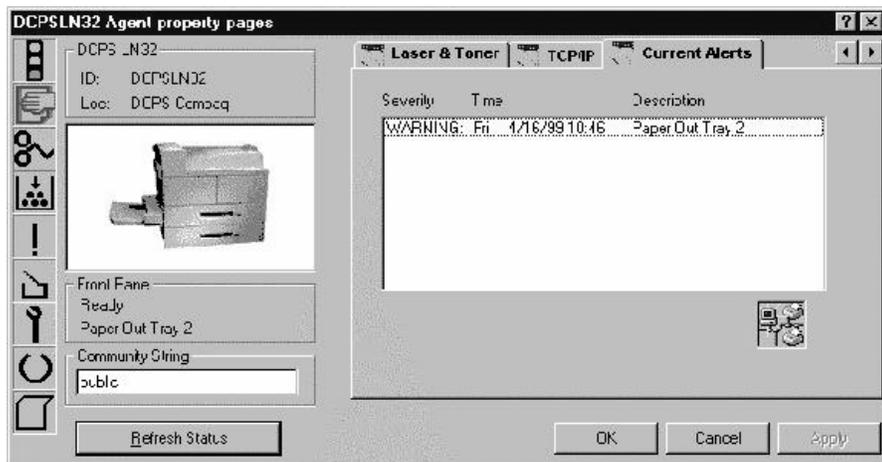
Input Trays/Output Bins

These pages allow the system administrator to set the printer's default input and output trays.



Current Alerts

Current Alerts tracks the most recent problems found on the printer.



Refer to Appendix A for more information on the support provided for all Compaq and DIGITAL printers.

Printer Monitoring Facilities

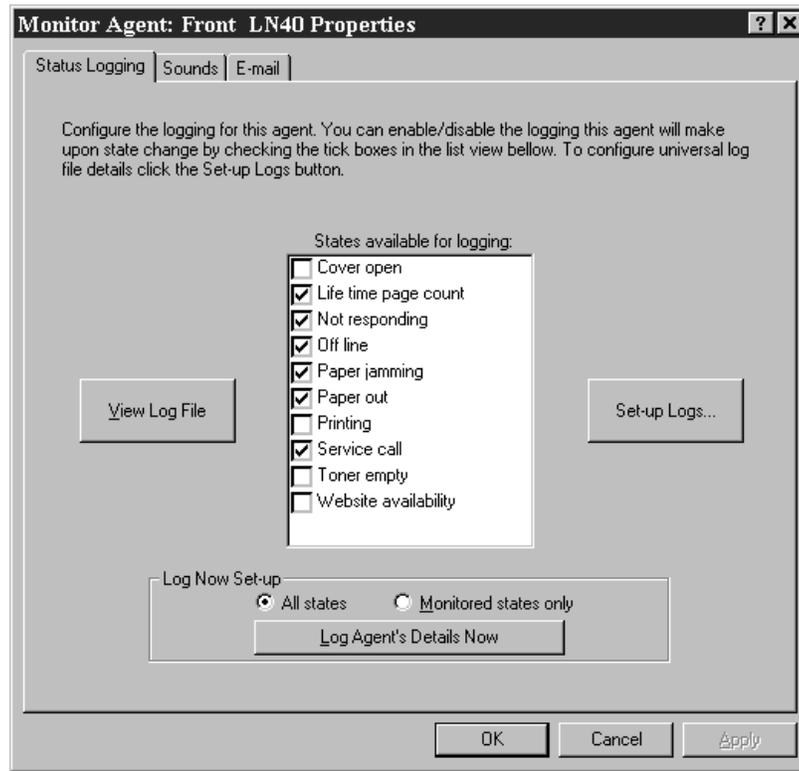
RCS has sound, email and logging facilities which enable you to set up a comprehensive monitoring system for your network. You have the option to enable a single printer, or all of the printers.



Refer to Chapter 2 for additional information about enabling printers.

To access the printer monitoring facilities:

1. Right-click on an printer icon on the map screen.
2. From the popup menu, select **Monitor Agent**. This will bring up the Monitor Agent Screen.
3. Click on the **Status Logging** tab to see the following page:



The Status Logging page allows you to configure the logging for the selected printer. The log file you create will keep a record of the status of the printer.

States Available for Logging: Select a check box in the list to enable or disable logging performed by the selected printer when a state change occurs. This list will be different, depending on the type of printer.

View Log File: Selecting this button allows you to instantly view the log file. The log file window will open, displaying the status history of the printer that you have chosen to monitor

Setup Logs: Select this button to configure universal log file details.

Log Now Setup: In the Log Now Setup frame, you can choose whether logging will occur for **All states** or for **Monitored states only**. Once a choice is made, select the **Log Agent's Details Now** button for instant logging.

Sounds



To utilize the sound facilities, it is necessary to have a sound card installed on your PC. Even if you do not have a sound card installed on your system, the Sounds page will still appear. However, you still will not be able to test the sounds.

RCS comes with a full compliment of default sound settings. The Sounds page gives you the option of overriding the sound defaults and setting up your own customized sounds.



Details of further sound configuration facilities can be found in the section **Setup Sounds Page** later in this chapter.

Clicking on the **Sounds** tab in the same **Monitor Agent** screen will bring up the Sounds page.



States Available for Audio Alert: You can enable/disable the sounds made by the device when a state change occurs by checking the boxes found in this list. This list will change according to the printer you are viewing.

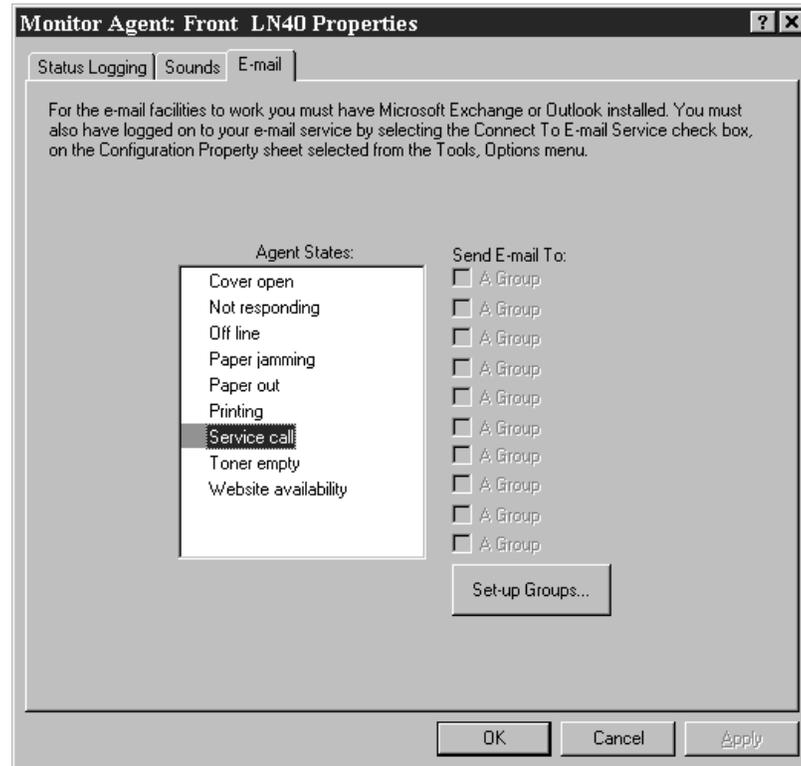
Setup Sounds: Click this button to configure *universal* sound settings.

Configure Sound Attached to this Agent: To set a sound of your own choice to this particular printer:

1. Click on the **Browse** button. the file path shown in the **Path** field represents the currently selected wave file.
2. Scroll through file paths list to locate a new wave (.wav) file.
3. To test the sound before configuration is complete, select the **Test Sound** button.
4. Once a sound is chosen, check the **Set sound as default for new agents** box to have this sound automatically assigned to all new devices.

Email

Clicking on the **Email** tab in the same **Monitor Agent** screen will bring up the following Email page:



Before using the email facilities, you must have Microsoft Exchange or Outlook installed. RCS can be configured to automatically connect to the email service when it is started.

Agent States: This list shows the various states existing for a particular printer, and will vary according to that printer's type.

Send Email To: The Email recipient groups which you configure in Setup Groups (see below) are listed here. To have email sent to a group, check the box next to its name.

Setup Groups: Select this option to setup and configure groups of Email recipients. The group names will appear listed under **Send Email to** on the Email page.

RCS Graph Wizard

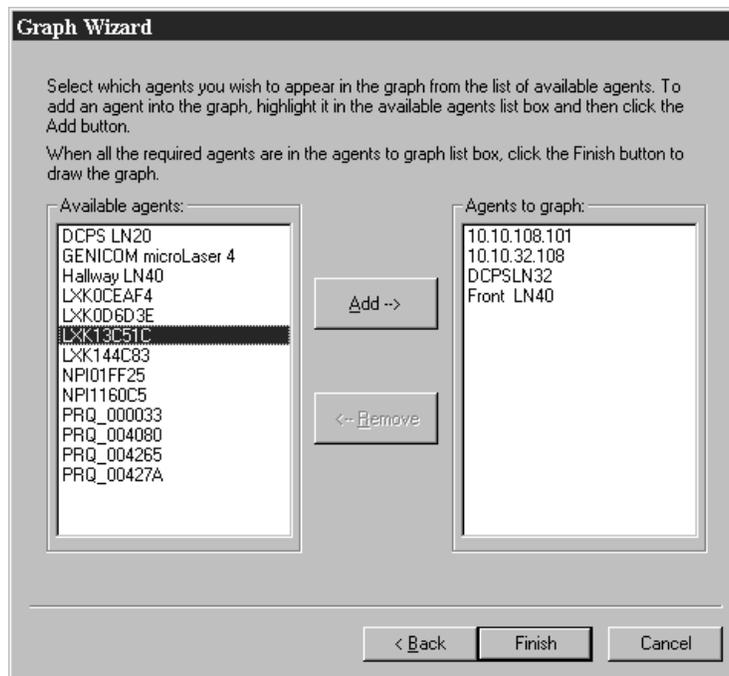
RCS has the ability to create Page Count Graphs to enable you to monitor the number of pages printed by each of your network printers.



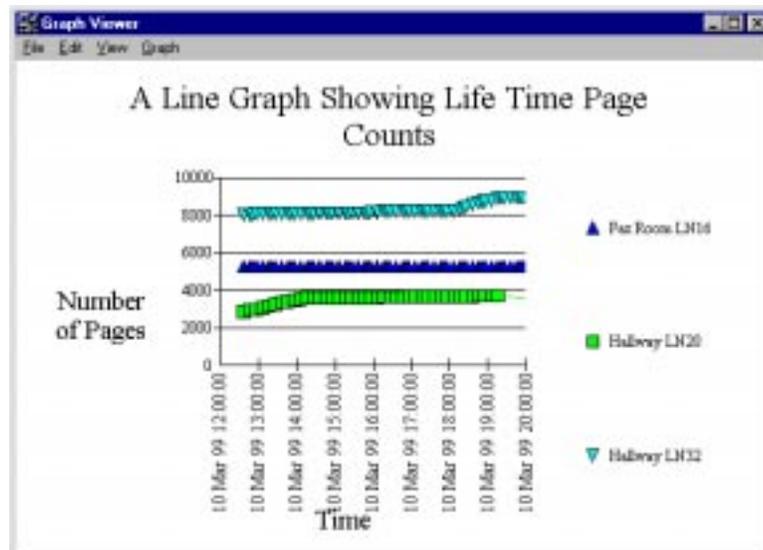
To use this facility, it is first necessary to enable the lifetime page count in the log file, which will provide the information for the graph (for details on how to do this see page 4-1).

To create a page count graph:

1. Select **Graphs** from the **View** menu at the top of the map screen. This will launch the Graph Wizard.
2. Click **Next**, then **Next** again. In the displayed dialog box, enter the path to the log file to be used for the graph and click the **Add** button, or use the **Browse** button to find the file and click on **Open**. The file will be added to the list in the bottom half of the box. You can enter as many files as you require.
3. Click on the required file in the list to highlight it and click on **Next**. The following dialog box will be displayed:



4. In the left hand box are listed the printers available on the log file. Select the printers you want to appear in your graph and click on the **Add** button. Your selection(s) will appear in the right hand **Agents to Graph** box.
5. Click on the **Finish** button and **OK** the following message box. The graph will be displayed. An example is shown below, with the page count history of three printers.



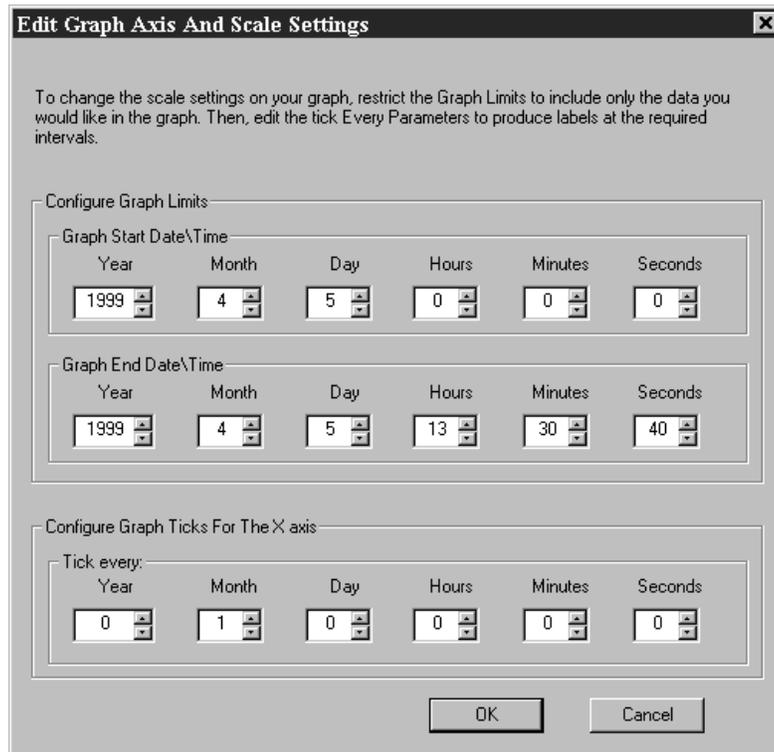
At the top of the Graph Viewer screen is a menu bar which gives access to the following options:

File/Save As: Use this option to save your graph as a windows bitmap.

Print: Use this option to print out your graph.

Edit/Copy: Using this option, the graph can be copied and pasted into other applications.

Graph/Axis and Scale Settings: Selecting this option will display the following dialog box:



This option enables you to tailor the graph to your requirements by changing the default scale settings to include only the data you would like in the Graph.

Configure Graph Limits/Graph Start Date/Time: Enter here the date you want the graph to start from.

Graph End Date/Time: Enter here the date you want the graph to end on.

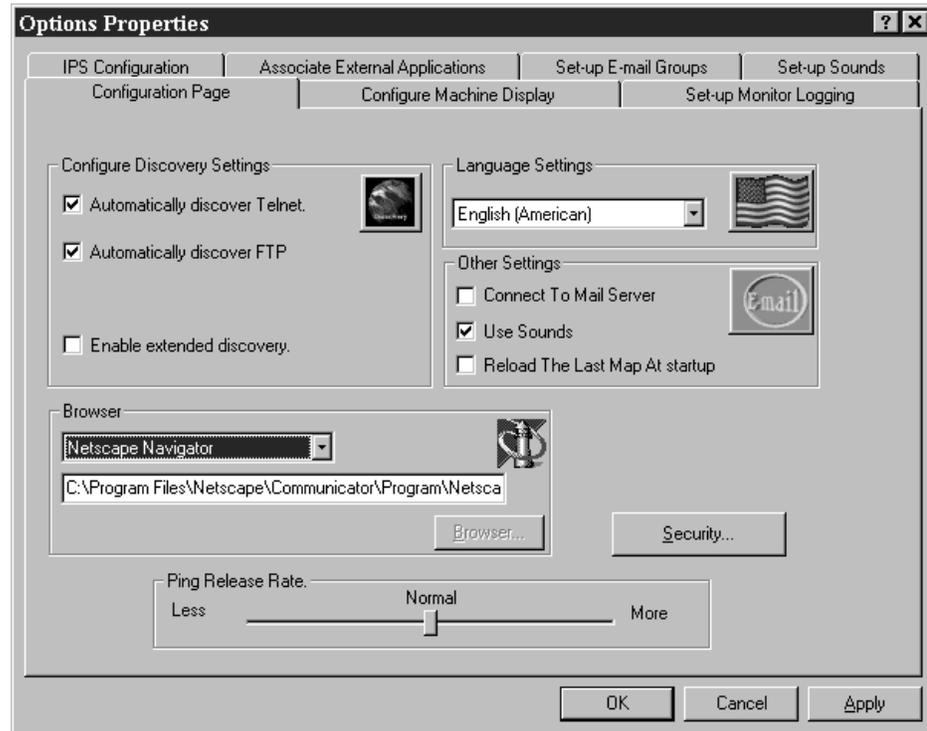
Configure Graph Ticks for the X Axis: This enables you to set the configuration of the Time axis to your requirements.

Options Property Pages

To access additional monitoring facilities:

1. Click on **Options** from the **Tools** menu at the top of the map screen. You will see a dialog box titled **Options Properties** with seven tab options.
2. Clicking on each tab will access a different property page enabling you to view and configure the information. The function of each property page is explained below:

Configuration Page



Configure Discovery Settings:

The first two of these settings allow you to designate which of the two available options - Telnet, or FTP - you want RCS to automatically discover. They can be set in any combination you require.

Enable Extended Discovery: This third option can be useful if you are trying to discover an entire network. When this option is selected for each new printer with SNMP that RCS discovers, that printer's ARP Table is interrogated to find further addresses to discover. This will often result in extra printers being displayed on the Map Screen, including devices that were not actually requested in the original search criteria.

Language Settings:

This drop-down list allows you to change the language used in RCS: Select from English, French, German, Spanish, or Italian.

RCS has a three level security system that is expandable and fully configurable. An administrator can use the Security dialog box to create and customize new security levels and configure the access rights of existing levels. Some users, for example, could be allowed to view a map but not save any devices to it. The three security levels are **User**, **Operator** and **Administrator**.

The Security dialog box contains two menus - **User** and **Options** - and a list view, as shown above. The list view shows the **Username**, **Access Type** (access rights to the program) and a **Description field** for all users in the database. Each active user has a tick next to it. The user currently logged on has a star next to their name. The list can be sorted into either ascending or descending alphabetical order by clicking on the column headers.

Also, under the drop-down menu, you can select **Remove all Security** if you do not require user access rights any longer.

To set access rights:

1. Click on the **User** menu.
2. Select the **New User** option. The following dialog box appears:



The **User Properties** dialog box allows you to add security access and perform management functions.

Access Level: Choose an **Access Level** from the drop-down list. If you are creating the first user, access level **must** be administrator. Initially, only administrators have access to Security options. You cannot configure any security options until you have created an administrator.

Username and Password: Use these fields to add new user names and their passwords at the selected **Access Level**. Each user will need to enter their own password every time they want to access RCS. In the **Description** field you will see a description of the user's access rights.

If you want to prompt the user to change their password at first login, select the **Change Password at Startup** box.

Select the **Disable Users Access** box to disable this users access.

To go back to the Security dialog box, choose **OK**. You will see the user names you have entered are now listed on the page.

Other facilities under the User drop-down menu enable you to delete or rename each user.

User Logon

If security has been configured for your copy of RCS, you will need to log on when you start the application. If the program is already running and another user is logged on, you can log on by choosing **User Logon** from the **User Access** menu on the RCS main screen. The **RCS Security** dialog box will appear for you to enter your password.

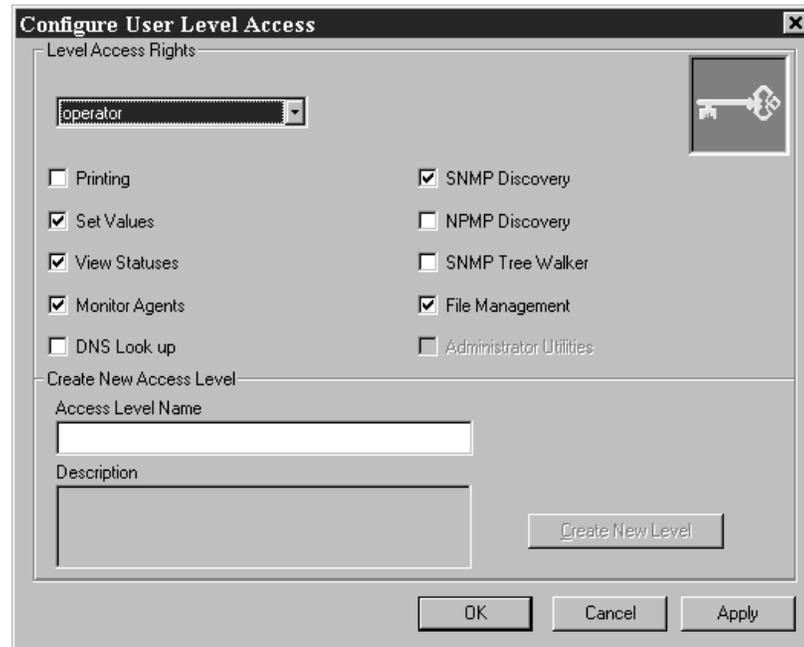
User Logoff

There are two ways to log out of RCS. You can log-off, and shutdown RCS, or you can log-off, and still keep RCS running. To log-off and still keep RCS running, you must select **User Logoff** from the **User Access** menu on the RCS main screen. RCS will automatically log you out of its program, but will continue to run. No other dialog box will appear.



Choosing this logoff method causes all operations to be restricted until a user logs on.

Security access levels can be further expanded and configured by clicking on the **Options** menu in the **Security** dialog box and selecting the **Configure Access levels** menu option. The following dialog box will appear:



The **Configure User Level Access** dialog box enables you to define access rights for the various levels and create new access levels if required.

Level Access Rights: This section of the dialog box shows existing Access levels and their corresponding Access Rights. The current Access Level appears in the drop-down list. The selected check boxes indicate which options can be accessed by users from this level. Scroll through the drop-down list to view access rights available for the various Access Levels.

Select the level you want to configure from the drop down list. The default check boxes will be automatically selected to show the level's current access rights. Select and/or deselect the appropriate check boxes for the user level. When user configuration is complete, click on **Apply** or **OK** or click on **Cancel** to discard any changes.

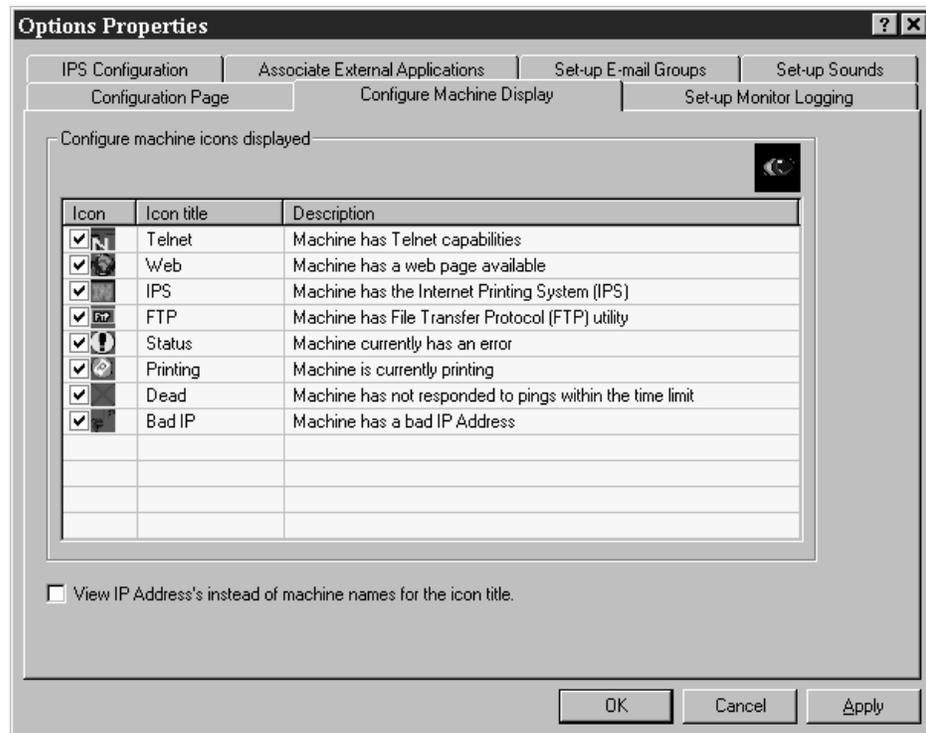
Create New Access Level: To create a new Access Level:

1. type a unique name in the **Access Level Name** text box.
2. Type a brief description of the new level in the **Description** box, which is automatically activated.
3. Select the **Create New Level** button to insert and highlight the new level in the drop-down list.
4. The default check boxes will automatically be selected. Select and/or deselect as required.

5. Click on the **Apply** button for immediate application of all chosen settings. Click on **OK** to return to the Security dialog box.

This option will completely destroy all security configured for the application. When all security is removed, RCS will be fully accessible by any user.

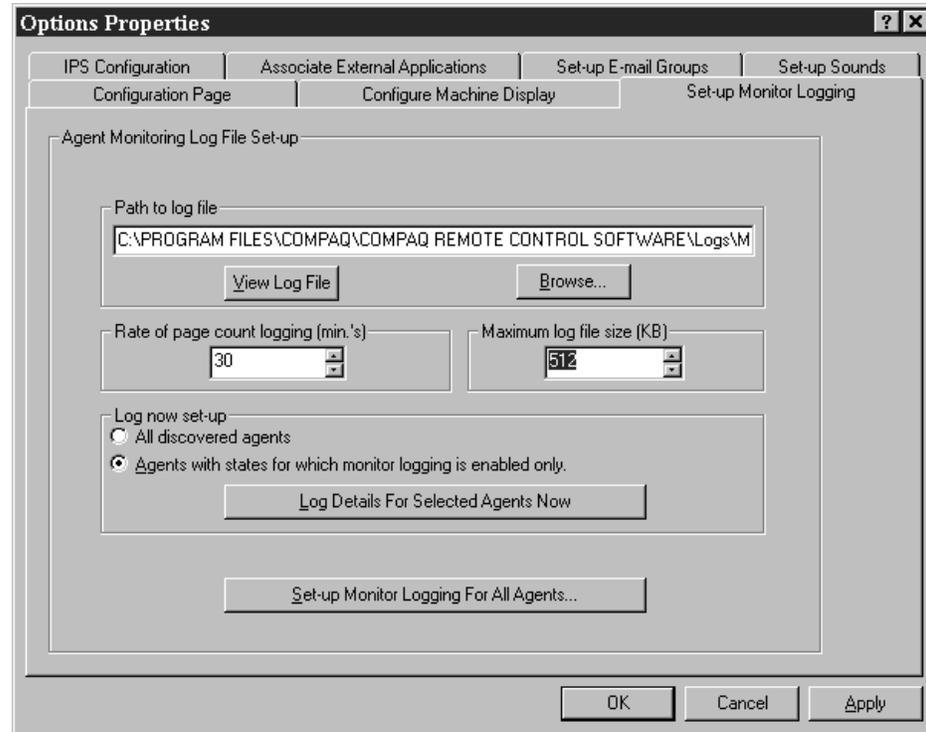
Configure Machine Display Page



Configure Machine Icons Displayed: This table displays the icons that can appear over a device on the Map Screen and explains the purpose of each. Choose which icons to activate by clicking in the check box next to each icon.

View IP Addresses: Selecting this check box will allow you to view an IP address instead of a machine name for each icon title.

Setup Monitor Logging Page



Path to Log File: This is the directory or file path to be used by RCS for maintaining a log file for printer monitoring. You can change this file path by either retyping the path in the data field or by selecting the **Browse** button.

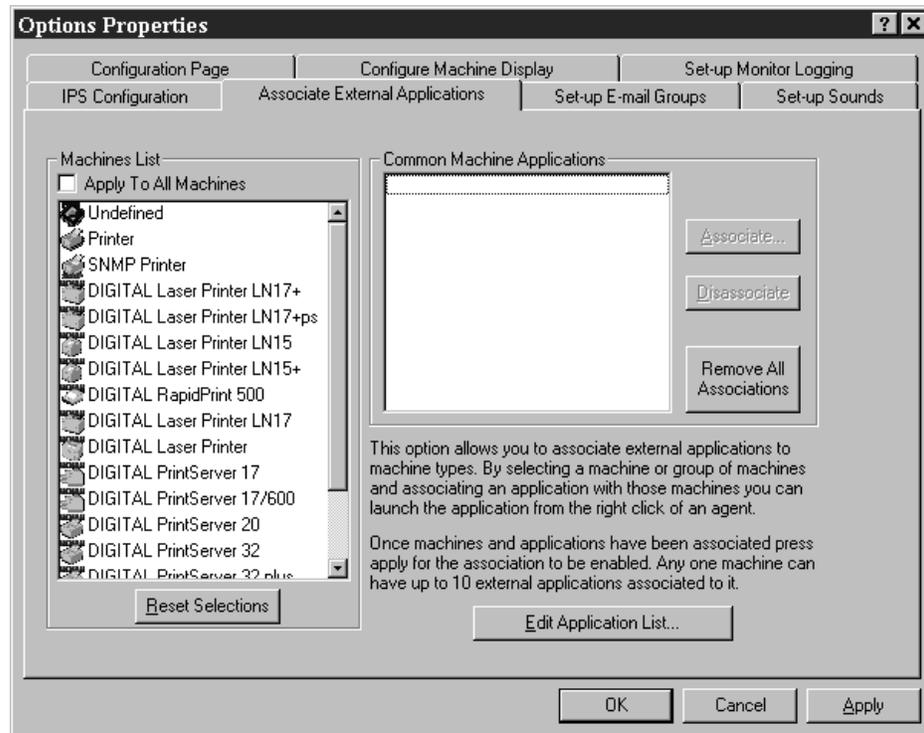
Rate of Page Count Logging: This is the frequency at which the log file will be updated with page count information. More frequent logging help to ensure that the log is up-to-date.

Maximum Log File Size: This is the maximum space allowed for the log file. Select the **View Log File** button to view the log file. If the log file reaches the maximum size, it is automatically placed in a backup file with the same file name but ending with `_backup.xxx`, where `xxx` represents the version number of the log file with the highest number being most recent. The backup files will be the same size as the maximum size that was allowed when they were created.

Log Now Setup: This option allows you to choose whether you want a log file setup for all discovered printers or only printers with states for which monitor logging is enabled. If you select the **Log Details For Selected Agents Now** button, you will force immediate logging to occur only for the printers for which monitoring is configured.

Setup Monitor Logging for All Agents: If you select this button, monitor logging will be setup for all devices. This option can save you time when you are setting up several devices for the same type of monitoring.

Associate External Applications Page



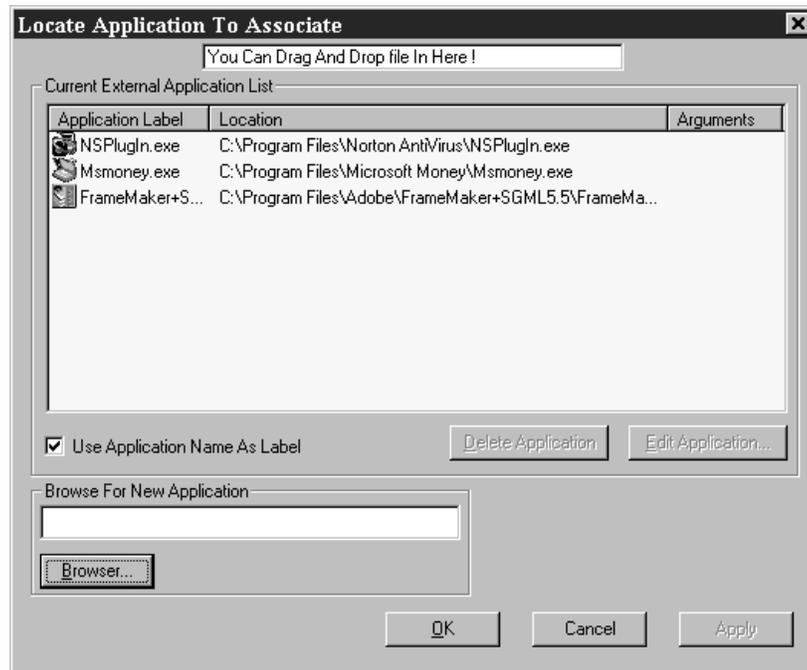
This option allows you to associate specific external applications with chosen machine types and then launch the application by right clicking on a device. Initially, you will need to add applications to the list, and then associate the machine(s) to the application(s). Any one machine can have up to ten external applications associated with it.

To begin the association process:

1. Select the **Edit Applications List** button to display the **Locate Application to Associate** dialog box that is shown on the next page.

You can use this dialog box to configure a list of applications associated with specific machine types. Applications can be selected for addition to the list using the Browse button, Browse for New Application field, or the drag-and-drop method. applications can also be deleted or edited. After association is complete, you will be able to launch the applications by right clicking on an printer or by choosing **External Applications** from the **Tools** menu.

The dialog box operates as follows:



You Can Drag and Drop File in Here ! Box: Click on a file (for example from your desktop) hold down the mouse, and drag it to the **You Can Drag and Drop File in Here !** box. The file is automatically added to the **Current External Application** list.

Application Label Field: The **Application Label** field contains either the file name of the application or the name you type in the **Label** field of the Label Application dialog box. An application's **Label** will display on any menus that refer to the application.

Location: This is the drive and file path for the application shown in the **Application Label** field.

Use Application Name as Label: When this is selected, the file name of an application added or edited automatically appears in the **Application Label** field. If the box is not selected, the name you type in the **Label** field of the Label Application dialog box appears.

Browse for New Application: In this field, type a file path for the application you want to add and/or edit.

Browse Button: Select the **Browse** button to browse the Windows directories and folders.

Delete Application Button: Select an application from the **Application Label** field and then click on **Delete Application** to remove it from the **Current External Application List**.

Arguments: If you add a new application to the list without selecting the **Use Application Name As Label** check box, you can assign an argument to the application in the **Label Application** dialog box. Arguments are specific to different programs. For example, an IP address may be used for some programs, or a string of program options (e.g. "-a").

RCS supports a special argument, **IPADDRESS**, which will cause the program to automatically substitute the IP address of the current device for the argument. You can mix other program option arguments with the **IPADDRESS** special argument. If the application is launched from the **External Applications** option in the **Tools** menu, there is no IP Address, and this part of the argument is ignored. If you need to launch an application with a certain IP Address, instead of the **IPADDRESS**, type the actual IP Address (for example) 255.255.255.0.

Select specific machines by highlighting their names in the **Machines List** or check **Apply To All Machines** (you can redo your choices by selecting the **Reset Selections** button).

2. To associate or disassociate the chosen machines with applications shown in the **Common Machine Applications** list, highlight an application from the list.
3. Press one of the following three buttons:

Associate Button: Selecting this button will associate the type of device with the selected application, creating a link between the two.

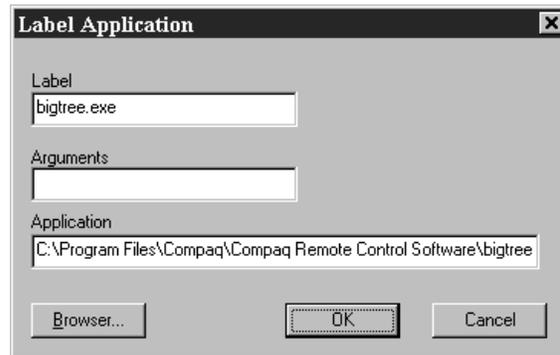
Disassociate Button: Selecting this button will disassociate the type of device from the selected application, removing a link between the two.

Remove All Associations Button: Selecting this button causes a global disassociation to occur.

4. Once machines and applications have been associated, press **Apply** for the association to be enabled.

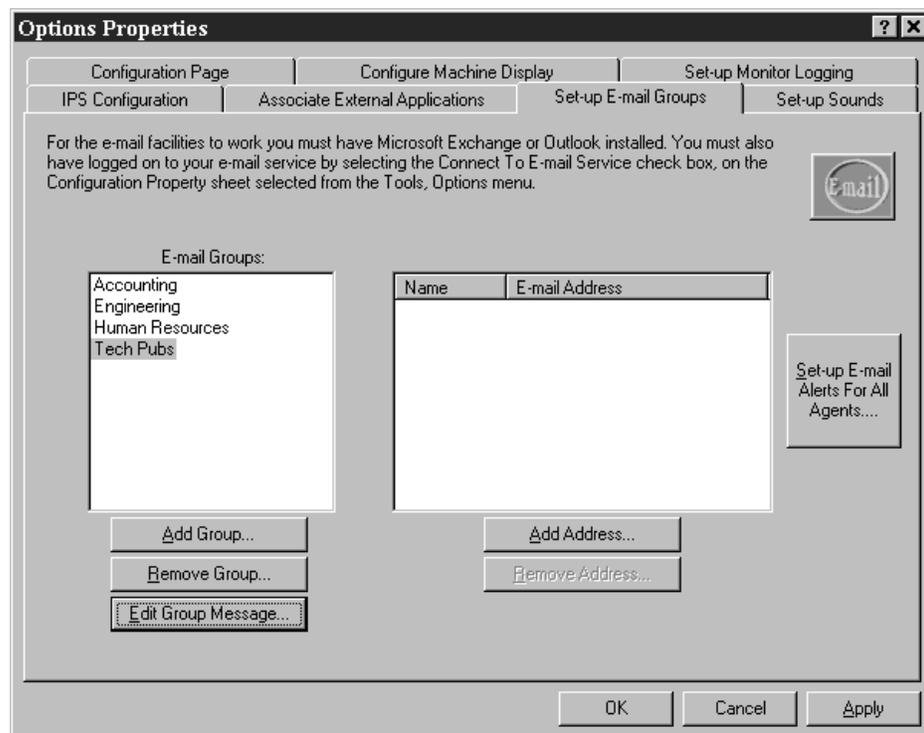
Edit Application Button: To edit an application in the **Locate Application to Associate** dialog box.

1. Click on an application in the **Application Label** field.
2. Click on the **Edit Application** button. The **Label Application** dialog box will appear as shown.



3. Edit the Label and Arguments fields as you require. any changes made will appear in the **Locate Application to Associate** dialog box (you can click on the **Browse** button to locate additional files for editing).
4. Click on **OK** to save changes, or click on **Cancel** to exit the dialog box without saving changes.

Setup Email Groups Page



Email Groups: This option allows you to define groups of email recipients and send group messages. Select which printer states you want alerts for (for example ‘out of paper’) and then set RCS to email notification of the problem as soon as it occurs. Before configuring the RCS email group options, you must have installed either Microsoft Exchange or Outlook.



In addition, you must log on to your email service under **Tools menu>Options>Configuration Page>Other Settings>Connect to Mail Server.**

Add Group: When you click on the **Add Group** button, you will see a dialog box that allows you to add new groups to your list of group email recipients. You must assign a unique name to each group before associating names, addresses, and group messages with it. The group’s name will appear in the **Email Groups** list.

Remove Group: When you click on the **Remove Group** button, you will see a dialog box that allows you to remove existing groups from your list of group email recipients.

Edit Group Messages: Selecting this button allows you to edit the messages you have previously set up for specific groups listed in the **Email Groups** list.

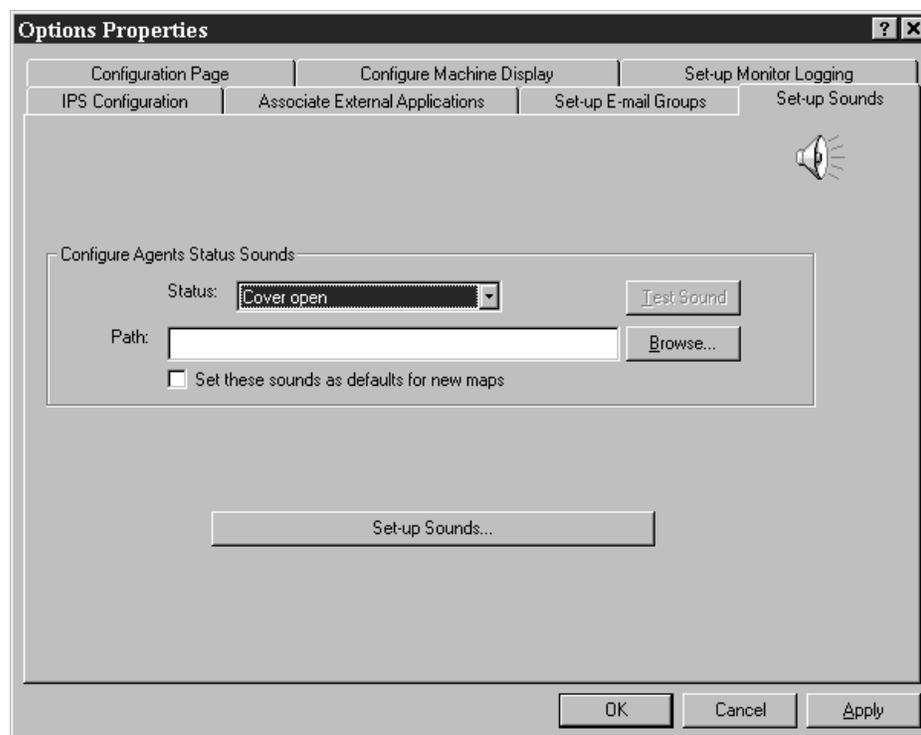
Name and Email Address: This list shows the names and email addresses of the individual members belonging to your email groups. When you select a group name from the Email Groups list, the member names and addresses will automatically appear here.

Add Address: Select this button to remove an existing address from the group currently selected in the **Email Groups** list.

Remove Address: Select this button to remove an existing address from the group currently selected in the **Email Groups** list.

Setup Email Alerts for All Agents: This button allows you to setup alerts for all printers (devices) that indicate when email has been sent or received. If you press this button you will see a dialog box prompting you for the necessary data to setup email alerts.

Setup Sounds Page



Configure Agent Status Sounds: You can associate specific error conditions with sound files (first, check the **Use Sounds** option under **Other Settings** on the **Configuration page** of **Options Properties**). The error condition shown in the **Status** field is associated with the sound file in the **Path** field.

Test Sound: Test a sound by pressing this button.

Browse: Use this button to find a sound file of your choice. After associating an error condition with a sound, click on the **Set these sounds as defaults for new maps** box to have the association apply to all new maps.

Setup Sounds: Select this button if you want to setup audio alerts for all printers discovered by RCS.

A

Support for Compaq and DIGITAL Network Printers

Compaq Remote Control Software (RCS) will recognize recent Compaq and DIGITAL network printers with special icons and management support through enhanced device property pages.

This appendix lists the several printer models and outlines the enhanced property pages available.

The Compaq RCS help file, available by selecting **Help Topics...** from the Help menu in the program, describes the enhanced property pages in more detail.

Printer	Functionality
Compaq Laser Printer LN16 Compaq Laser Printer LN32 DIGITAL Laser Printer LN17+	<ul style="list-style-type: none">• General Information• Input and Output Trays• Engine and Toner Status• TCP/IP information• Additional protocol information (LN17+ only)• SNMP community configuration (LN17+ only)• SNMP alert information
DIGITAL Laser Printer LN20 DIGITAL Laser Printer LN40 DIGITAL Laser Printer LNC02	<ul style="list-style-type: none">• General Information• Input and Output Trays (read-only)• TCP/IP information• Additional protocol information• SNMP community configuration

Printer	Functionality
Digital Laser Printer LN15 Digital Laser Printer LN15+ Digital RapidPrint 500	<ul style="list-style-type: none">• TCP/IP information• Parallel port status
Digital LN17	<ul style="list-style-type: none">• TCP/IP information• Additional protocol information• SNMP community configuration
Digital PrintServer 17 Digital PrintServer 17/600 Digital PrintServer 20 Digital PrintServer 32 Digital PrintServer 32+ Digital RapidPrint 200	<ul style="list-style-type: none">• Basic support only – no enhanced management information available.

B

Glossary

Administrator - The individual responsible for managing the LAN. This person configures the network, maintains the shared resources and security, and assigns passwords and privileges.

ARP (Address Resolution Protocol) - The Internet and TCP/IP protocol used to dynamically bind a high level IP address, such as an Internet address to a low level physical hardware address (12-digit node address assigned to all hardware).

DNS (Domain Name System/Server) - The online distributed database system used by the Internet to map names into IP addresses. Internet DNS servers implement a hierarchical name space which gives sites freedom when assigning machine names and addresses.

Domain - A group of network nodes forming an administrative entity or a number of servers grouped together and named to simplify network administration and security. Every computer on a LAN belongs to at least one domain. However, logging on to one domain does not limit resources in other domains in which the user has access permission.

FTP (File Transfer Protocol) - The standard high level TCP/IP protocol for transferring files from one machine to another across the Internet.

IP (Internet Protocol) - The TCP/IP standard protocol that defines the IP datagram as the unit of information passed across an Internet. TCP/IP provides the basis for connectionless packet delivery service.

IP Address - The 32-bit address assigned to a host allowing it to participate in a TCP/IP Internet.

LAN (Local Area Network) - A communication system that links computers together to form a network via (usually) a wire based cabling scheme. LANs connect PCs, workstations, and servers together, allowing users to communicate and share resources. Devices linked by a LAN may be on a floor of a building or on a campus.

MIB (Management Information Base) - The set of database variables that a gateway running CMOT, SNMP or CMIP network management protocols maintains. MIB defines variables needed by the SNMP protocol to monitor and control components in a network. Managers fetch from or store in these variables. MIB-11 refers to an extended SNMP management database that contains variables not shared by both CMOT and SNMP. The CMIP and SNMP MIB formats differ in structure and complexity.

Network Management - The process and techniques of remotely or locally monitoring and configuring networks.

SNMP (Simple Network Management Protocol) - A transmission protocol defined by the IAB in RCF1157 for TCP/IP based network management, widely accepted as a de facto standard for LAN network management. SNMP is used to monitor IP gateways and the networks to which they attach. It defines a set of variables that the gateway must keep and specifies that all operations on the gateway are a side-effect of fetching or storing to the data variables. SNMP consists of three parts: Structure of management Information (SMI), Management Information Base (MIB) and the protocol itself. The SMI and MIB define and store the set of managed entities; SNMP conveys information to and from these entities. The public domain standard is based on the operational experience of TCP/IP internetworks within DARPA/NSFnet.

TCP/IP (Transmission Control Protocol/Internet Protocol) - The suite of protocols used and developed by DARPA and the US DoI. The protocols build up to and include Layer Four of the ISO OSI model, but there is not direct correspondence layer for layer. Three main protocols sit above TCP/IP: TELNET, FTP and SMTP.

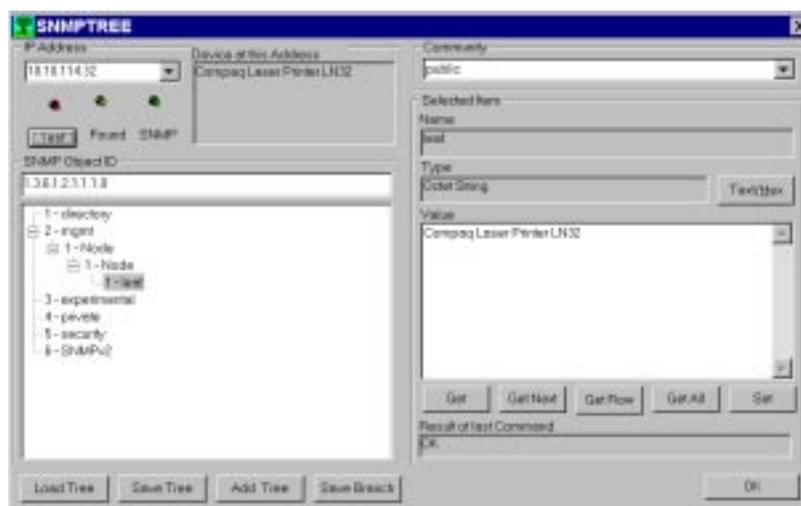
TELNET - The TCP/IP standard applications-level protocol for remote terminal connection service. Telnet allows a user at one site to transparently interact with, or pass through to a remote network or time-sharing system at another site, while appearing as a local terminal.

WAN (Wide Area Network) - A network covering a larger geographical area than a LAN where telecommunications links are implemented, and normally leased from the appropriate Public Telecommunications Operator(s). Examples of WANs include packet switched networks, public data networks and Value Added networks.

SNMP Tree Walker

The SNMP Tree Walker is an optional tool that allows the SNMP information available from a remote SNMP-compliant device to be retrieved and displayed. You can use this tool to review or modify SNMP values in a device if you have detailed information on the SNMP capabilities of a device.

To start the SNMP Tree Walker, select the **SNMP Tree Walker** command from the **RCS Tools Menu**, press the SNMP Tree Walker icon in the RCS Toolbar, or select **SNMP Tree Walker** from the Compaq Remote Control Software sub-menu of the Windows Start menu. You will see a SNMP Tree Walker dialog box such as the one below. Select an area of the dialog box to find out more information on the commands and information provided by this tool.



IP Address

Enter the IP Address of the network device you want to examine in the form of *xxx.xxx.xxx.xxx*, where each *xxx* is a number ranging from 1 to 255. You can also use the drop-down list to select an previously entered address. If you select a printer icon from the RCS™ map and start the SNMP Tree Walker, the IP Address of the printer will automatically be entered in the field.

Once you have selected an IP address, press the **Test** button. The application will then look for a device at the IP address, indicated by the **Test** light (red) flashing. If a device responds from the indicated IP address, then the red light will stop flashing and the **Found** light (yellow) will begin flashing. At this point, the application is attempting to determine if the device is SNMP compliant. If the device responds to the SNMP query, then a message will appear in the **Device at this address** box and the yellow light will stop flashing. The **SNMP** light (green) will begin flashing and the application will attempt to retrieve SNMP Object IDs from the device.

If a device is found, the name of the device is displayed in the **Device at this address** field. Otherwise, an error message will be shown.

SNMP Object ID

The first field shows the SNMP Object Identifier (**OID**) whose value is being displayed by the program. You can also enter a specific OID into this field to retrieve that information from the device.

Below the SNMP Object ID field is box containing a hierarchical representation (tree structure) of the SNMP MIB implementation in the device. You can navigate within the tree and open and close branches of the tree as needed. As additional MIB elements are queried or discovered by the program, they are added to the tree.

Community

A SNMP community identifies a family of devices and management programs such as the SNMP Tree Walker and Remote Control Software. SNMP messages issued by the programs and the devices use a named community to identify themselves. This provides a limited amount of authentication and security.

All devices typically implement the **public** community and that is the default value for this field. Many network managers modify or add community names to restrict read/write access. You can type a community name in this field and the program will use that community when sending SNMP messages to the device.

If a device responds (yellow light) but does not acknowledge SNMP calls (no green light) even though it is known to be SNMP capable, find out if the device is set to use a different community name, and enter that name in the community box, then try again.

Selected Item

Name: This shows the current object's name. This is only available if it has been read in as part of a tree -- it will be shown as **new** if the object has been obtained from a remote device. The name comes from a MIB, not from the device being tested.

Type: This shows the datatype of the object. This will show in upper case if it was obtained from the tree information, it will change to lower case if it is obtained from the actual value read from a remote device.

The **Text/Hex** button to the right of the Type display switches the **Value** display from text to Hexadecimal format. Some items retrieved are marked as being octets (i.e. bytes) these are often text strings and are displayed as such. Some octets represent quantities such as machine addresses, in these cases the actual numerical value of each byte displayed as two hexadecimal digits is more useful.

Value: This shows the value retrieved for the current object. The display is scrollable, to allow for very large values, and can be switched from text to hex type displays as needed (see **Text/Hex** button above).

Result of last Command: This shows a message about the progress of the most recent command, this will normally be either **OK**, or an error message saying why a requested command failed. A command refers to selecting one of the buttons from the row of buttons above this box.

If **Not Responding** is shown, the device is no longer responding to SNMP requests or is no longer connected to the network. Use the **Test** button to determine whether the device can be contacted.

How Do You Use the SNMP Tree Walker?

This is a short tutorial on using the SNMP Tree Walker. This tutorial will cover the following topics:

- Connecting to a printer or other network device.
- Using the tool to retrieve and display SNMP information

For additional information about the SNMP Tree Walker beyond this tutorial, consult the Remote Control Software Administration Guide.

Connecting to a printer or other network device

To establish a connection to a printer or other network device, you must know its **IP Address**. Enter the IP Address of the device in the field at the top left of the SNMP Tree Walker dialog box marked **IP Address**. If SNMP Tree Walker has been selected from Remote Control Software (RCS™) with a printer selected, the IP Address panel will already contain the address of the selected device.

Next, select the **Test** button (below the red indicator light) to establish a link to the device and the specified address. If there is a problem with the address, an error message will be shown in the text field to the right of the address. Otherwise, the message **Testing Address** will be displayed and the red indicator light will start flashing.

When a response is received from the remote device the red light extinguishes and the yellow indicator starts flashing. Having established a link the program proceeds to try and retrieve a system description, using SNMP OID 1.3.6.1.2.1.1.1), which is implemented by all SNMP-capable devices. If this is successful the system description will be displayed in the message panel **Device at this Address** and the green light will flash. At this point a full link has been set up and you can use the program to retrieve and display SNMP information.

Troubleshooting

The indicators and error messages displayed near the IP Address will change if there is a problem in connecting to the device. This section describes the error conditions that can occur.

This is not a valid IP Address

This message is displayed when the IP address specified is not correct. The program will only accept an address consisting of exactly 4 numbers separated by period characters and each number must be in the range 0 to 255.

Unrecognized error code received (red light or no light)

The device with the IP address must exist and be on the same network as the computer running the SNMP Tree Walker program. If this does not occur, the red light will stay on until the program times out and this message will be displayed. On a large network, the first attempt could fail. You can attempt to connect again by selecting the **Test** button (under the red light).

Connection to this address (yellow light)

This message will be displayed when either the remote device has no SNMP capability but responds on the TCP/IP network or the remote device is not responding to the SNMP message using the specified **Community Name**. Verify that you have selected the correct IP address for the remote device or change the community name

to the community used on your network. It is also possible that the remote device you have selected may have implemented an earlier version of SNMP and may not respond to the initial request from the program. You can use the **Get Next** button or specify an Object Identifier to examine this device.

Identifying an Object

Individual objects are identified in the SNMP world by a unique code, an Object Identifier often abbreviated to 'OID'. An OID consists of a series of positive numbers separated by period characters. While there is no standard limit to the size of the numbers or the overall length of an OID, the SNMP Tree Walker program imposes a maximum of 5 digits on each number (0 - 99999) and allows a maximum 100 such numbers in any one OID.

To make full use of the SNMP information in a device with this tool, you must obtain the manufacturer supplied information in the form of a SNMP MIB, a human readable document laid out according to a defined format which lists the OIDs in some collection of sub-branches and details their relationships and use. Typically, the information is structured in the form of one or more branches of a tree. All SNMP Object Identifiers are assigned in well-defined parts of an infinite tree, the very earliest branches of which are defined by standards organizations.

Even when the MIB is not available, the program can interrogate values common across all SNMP implementations and determine SNMP values for the device by "walking" the SNMP information in the device. Using SNMP Tree Walker, individual values and tables of values may be examined using the command buttons. Parts or the whole of the tree discovered may be saved to be reloaded at other times.

In normal use the tree is first built up, either by reading in a prepared data file or by examining an unknown device. (See *Task 2, Filling in the Tree*). Then, a particular object is selected by pointing to it in the representation of the tree in the panel which fills most of the left side of the screen display.

The tree display is manipulated in the same way as the tree display in the Windows Explorer. Branches are opened and closed by clicking on the little + and - signs, and a particular item is selected by clicking on it.

If a selected item represents an object which has a value the value will be fetched and displayed. If the item does not represent a value, but is part of the tree structure this information will also be shown. (See *Reading and Setting Values in Task 2*)

When an object is identified in the tree its OID will be displayed in the box just above the tree display. You may also enter an OID into this box directly.

Using the tool to retrieve and display SNMP information

To make full use of the SNMP information it is useful to fill out the tree structure in which the particular pieces of data we require are organised. Once the tree structure is filled in we can then select any particular OID, and fetch its value by pointing at it in the tree display. You can also directly enter an OID into the dialog box entry if you already know the information you are looking for.

Information for the tree comes from a mixture of two places, data files derived from standardized or manufacturer-written MIB documents, and the information stored in a device being examined.

Loading the Tree from Files

Data files are read in by using the buttons underneath the tree display in the bottom left corner of the screen display. The simplest starting point is just to click the **Load Tree** button. The file selection screen will pop up, click open, and the default file name **default.tre** will be selected and loaded. **Default.tre** contains information on the standardized early branches of the overall SNMP tree which are used by all SNMP devices. This file is supplied with the program. If the SNMP tree program has been called from another program - such as Remote Control Software (RCS™) - a different file name, appropriate to the task being performed may have been filled in for you instead of the default file.

Once the file has loaded you will see + signs appear next to some of the tree entries. Clicking on these + signs will expand the branch and open lower branches of the SNMP Object Identifier tree. If you want to add the information in a file to the existing tree display rather than replacing it, push the **Add Tree** button rather than the **Load Tree** button before selecting the file.

Loading the Tree from an Unknown Device.

Each time the **Get Next** button (in the bottom right of the screen display) is pushed a request is sent to the device under test requesting the next value it has. All SNMP compliant devices respond to this request, providing the next item of SNMP information, until the device reaches the end of its information, as defined by the MIBs for the device. By repeatedly using the **Get Next** command, the SNMP tree for the unknown device can be built. The program automatically adds any new OIDs it receives to the tree.

When the program establishes a connection to the device, it queries for a particular OID that is the standardized OID for the system description (1.3.6.1.2.1.1.1). From this starting point, the device can respond to requests for the next item available. You can use the **Get All** button to repeatedly send **Get Next** commands to the device until it reaches the end of its SNMP information.

Using **Get All**, you can build a SNMP Tree for an unknown device. Some devices have a very large number of OIDs, so the **Get All** button toggles, you can push it again to stop the process. Some devices take considerable processing time to produce some SNMP information and the program may time out and you will see a "Not Responding" error message. In this case, press **Get All** again to resume the tree walk..

Saving Tree Information.

Use the two buttons on the bottom left of the dialog box to save the SNMP tree data files.

Save Tree will prompt for a file name, and then save the current tree information as the file name entered.

Save Branch saves a file in the same way as Save Tree and again will prompt for a file name. The difference is that while Save Tree saves the whole tree, Save Branch saves only those items below and to the right of the currently selected item. This allows you to collect information from a number of devices, and then at the end of a session save each manufactures tree segment separately.

Reading and Setting Values.

The panel for reading and setting values occupies most of the right half of the screen. Most of the panel is occupied by boxes which display information about the current item. Towards the bottom of the panel is a row of five buttons, these are used to issue instructions.

Displays

The first line of the display shows the current object's name. This is only available if it has been read in as part of a tree, it will be shown as 'new' if the object has been obtained from a remote device. The name comes from a MIB, not from the device being tested.

The second line shows the object type. This will show in upper case if it was obtained from the tree information, it will change to lower case if it is obtained from the actual value read from a remote device.

The button to the right of the type display **Text/Hex** switches the **Value** display from text to Hexadecimal display. Some items retrieved are marked as being octets (i.e. bytes) these are often text strings and are displayed as such. Some octets represent quantities such as machine addresses, in these cases the actual numerical value of each byte displayed as two hexadecimal digits is more useful.

The third block of display in this panel shows the value retrieved for the current object. The display is scrollable, to allow for very large values, and can be switched from text to hex type displays as needed.

The last line of display, under the buttons, shows a message about the progress of the most recent command, this will normally be either **OK**, or an error message saying why a requested command failed.

Buttons

Get

Fetches the value for the OID currently selected in the tree. This is used mainly when looking at a value which changes frequently, the value for an OID is automatically fetched when the OID is chosen in the tree.

Get Next

Fetches the next value after the one currently selected. Particularly useful when dealing with unknown devices when the next OID is not known.

Get Row

The value for an OID is often shown as the OID with an extra zero on the end. A table of values is shown as the OID with a range of values on the end, one for each value in the table. If the tree currently indicates an OID associated with a range in this way pushing the Get Row button will call all the values to be fetched and displayed at once.

Get All

The Get All button repeatedly issues the Get Next command until no further values are forthcoming. This is useful for filling in all the details of the tree structure of an unknown device. The button acts as both a stop and start. Some devices take considerable processing time to produce some SNMP information and the program may time out and you will see a "Not Responding" error message. In this case, press **Get All** again to resume the tree walk..

Set

This causes the data shown in the value box to be sent to the remote device. If the remote is set-up to allow it this will change the value on the remote device. The Value window allows such values to be edited and entered. You may have to change the **Community Name** field in your environment to have the Set function perform correctly..

OK

The OK button is in the bottom right corner of the screen display. It dismisses the program.