CIMS Lab, Inc.

CIMS Data Collector for UNIX

User Guide

Version 4.1.3

Table of Contents

CIMS Data Collector for UNIX User Guide

Preface

As companies continue to integrate computer technology into their business operations, it becomes increasingly important to properly administer the IT function, particularly with respect to performance and cost. And the best way to control costs is to plan for them.

CIMS Chargeback is a comprehensive, flexible software solution that consolidates a wide variety of accounting data for multiple operating systems into a single file that may be accessed from either the mainframe or a workstation. Simply put, CIMS Chargeback is an essential component of an effective financial management system.

Philosophy

Originally developed in 1974, CIMS has focused on meeting the financial and resource reporting requirements of Information Services Departments. CIMS has evolved with corporate IT management requirements. Focused commitment to client service and support sets CIMS apart from competing products. Our goal is to provide the best chargeback and resource reporting software in the world at the lowest possible cost to our customers.

The CIMS Lab strongly believes in and executes the concept of continuous product improvement. Customers have access to CIMS product development personnel to ensure that customer feedback and other critical issues are incorporated into the next release of the product.

Contacting the CIMS Lab

You can contact us with any questions or problems you have. Please use one of the methods below to contact us.

For product assistance or information, contact:

USA & Canada, toll free	(800) 283-4267
International	(916) 783-8525
FAX	(916) 783-2090
World Wide Web	**www.cimslab.com**

Our Mailing Address is:

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3013 Douglas Blvd., Suite 120
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About This Guide

The *CIMS Chargeback for NT/UNIX User Guide* provides information about the various features and capabilities of CIMS for NT/UNIX. CIMS for NT/UNIX was formerly known as ARSAP for NT and UNIX. There are, therefore, references to ARSAP throughout this guide. If you handle UNIX responsibilities, you should understand the UNIX operating system and accounting procedures. If you handle NT responsibilities, you should understand the NT operating system and event logging service.

This guide assumes that the appropriate *CIMS Data Collector for UNIX* components have been installed at your site. The instructions for installing the product are in the Installation and Getting Started Guide.

Ch. No.	Chapter Name	Content Description
1	*Introduction*	Provides an overview of CIMS for NT/UNIX and the user interfaces of CIMS.
2	*CIMS for NT/UNIX Set-Up*	Presents an overview of the set-up phase; describes how to set up user and project accounts, define image names to packages, set-up database, storage, batch, print accounting settings and how to establish the system-wide parameters needed for data consolidation and reporting. How to set up the important CIMS for NT/UNIX parameter files is also discussed.
3	*CIMS for NT/UNIX Data Collection*	Presents an overview of the data collection phase, and describes the data accumulation and the data formatting phase.
4	*CIMS for NT/UNIX Data Consolidation*	Presents an overview of the data consolidation phase.

Ch. No.	Chapter Name	Content Description
5	*CIMS for NT/UNIX Data Reporting*	Presents an overview of the data reporting phase, discusses how to produce textual reports, discusses how to produce graphic reports, and discusses data reporting under CIMS for OpenVMS.
	Index	Helps you locate information within this manual.

What's New

CIMS Data Collector for UNIX for NT/UNIX Version 4.1.3 offers all the functions available in earlier releases, plus these new features:

Authorize/Validate

The `VALIDATE` Utility has been removed and its functions incorporated into the `AUTHORIZE` Utility.

DB User Accounting Grouping

User grouping can now be asigned based on the database USERNAME instead of the operating system USERNAME.

DB Absolute Shift/Daily Accounting

Support for writing partial accounting records at shift boundaries as well as at the end of each day. This feature helps in accounting for long running database sessions.

Control Multiple DB2 Daemons

New administration script to start, stop and check the DB2 Accounting Daemons.

Year 2000 Ready

CIMS for NT/UNIX properly handles the changeover to the new millenium.

IBM DB2 PE (Parallel Edition) and UDB V5 Support

CIMS for UNIX supports processing accounting data from IBM DB2 PE (Parallel Edition) and UDB V5.

CIMS MVS Integration

CIMS for UNIX provides UNIX statistics for processing by the CIMS MVS engine.

Conventions

Some or all of the following conventions appear in this guide:

Symbol or Type Style	Represents	Example
Bold	a new term	...called a **source object**.
alternate color	(online only) hotlinked cross-references to other sections in this guide; if you are viewing this guide online in PDF format, you can click the cross-reference to jump directly to its location	...see **Chapter 3, Data Migration**.
Italic	words that are emphasized	...the entry *after* the current entry...
	the titles of other documents	*CIMS for NT/UNIX Reference Guide*
	syntax variables	`COPY filename`
Monospace	directories, file names, command names, computer code	`&HIGHLVL.SRCLIB`
	computer screen text, system responses, command line commands	`Copy file? Y/N`
Monospace bold	what a user types	...enter `RUN APP.EXE` in the Application field
< >	the name of a key on the keyboard	Press <Enter>.
▶	choosing a command from a cascading menu	File ▶ Import ▶ Object

Related Publications

As you use this *CIMS Data Collector for UNIX User Guide*, you might find it helpful to have these additional books available for reference:

■ *CIMS Chargeback for NT/UNIX Installation and Getting Started Guide*

■ *CIMS Chargeback for NT/UNIX Reference Guide*

1

Introduction

CIMS for NT/UNIX is a resource management and chargeback facility that runs on multiple UNIX platforms and NT servers and workstations. CIMS for UNIX and CIMS for NT collect, process, organize, and report UNIX system accounting information and NT event information, respectively, along with other CIMS for NT/UNIX files. CIMS for NT/ UNIX utilities and scripts provide the flexibility to customize your set-up according to your needs and environment, collect necessary data, consolidate that data, and generate reports on this data in meaningful, custom reports.

This document presents CIMS for NT/UNIX in four distinct phases: set-up, data collection, data consolidation and data reporting. The set-up phase consists of steps to establish settings for users, projects, types of accounting, and system-wide parameters. The data collection phase accumulates the raw system and CIMS for NT/UNIX accounting files, and formats this data into the CIMS for NT/UNIX accounting and storage files. The data consolidation phase processes the CIMS for NT/UNIX accounting and storage files to create the CIMS for NT/UNIX statistics file. The data reporting phase generates textual and graphical reports from the CIMS for NT/UNIX statistics file. CIMS for NT/UNIX generates various reports in accordance with these two broad categories of customer needs:

■ Chargeback, or billing users for system use.

■ Resource management, or finding out how to get the most out of your system, or justifying why aspects of your system need to be changed.

CIMS for NT/UNIX provides numerous features to cover the varying needs of resource management and chargeback. These flexible features are presented here to help you weigh the importance of each feature for your particular accounting needs.

CIMS for NT/UNIX delivers easy and flexible resource management through resource usage statistics. CIMS for NT/UNIX tracks resources for stand-alone nodes, and nodes configured in a heterogeneous, open system architecture. CIMS for NT/UNIX also ascertains usage by users, groups of users, projects, departments, organizations and cost centers. CIMS for NT/UNIX gathers otherwise undetectable resource usage from within databases like Oracle and DB2.

CIMS for NT/UNIX delivers easy and accurate resource accounting and chargeback. CIMS for NT/UNIX allows the application of variable charges to resources by node, user and project. CIMS for NT/UNIX lets you define these charges for each statistic.

CIMS for NT/UNIX fits well into an open system architecture by combining resource statistics from multiple UNIX platforms, NT and VMS platforms. CIMS for NT/UNIX produces files that are cross-platform independent. CIMS for NT/UNIX consolidates data from multiple nodes simultaneously to reduce the processing time for large client-server configurations. CIMS for NT/UNIX utilizes the benefits of Networked File Systems (NFS) and supports Andrews File Systems (AFS).

CIMS provides two user interfaces: a Graphical User Interface (GUI) for UNIX and Command Line Interface (CLI) for both NT and UNIX. The CIMS for UNIX GUI provides a user-friendly interface to handle all CIMS for UNIX operational phases. The CIMS for NT/UNIX CLI provides a more direct interface with the CIMS for NT/UNIX utilities. This manual presents the use of the GUI for each of the resource management phases.

CIMS for UNIX Graphical User Interface (GUI)

The CIMS for UNIX GUI (A_gui) provides a user-friendly interface for the CIMS for UNIX administrator to handle the set-up, data consolidation, and data reporting phases. The main menu window has a file pull-down menu and eight (8) buttons: the four (4) buttons on the left portion of the main menu handle the set-up and data consolidation phases, and the four (4) buttons on the right of the screen present various options for performing data reporting. Figure 1-1 presents the Welcome to CIMS for UNIX main menu screen.
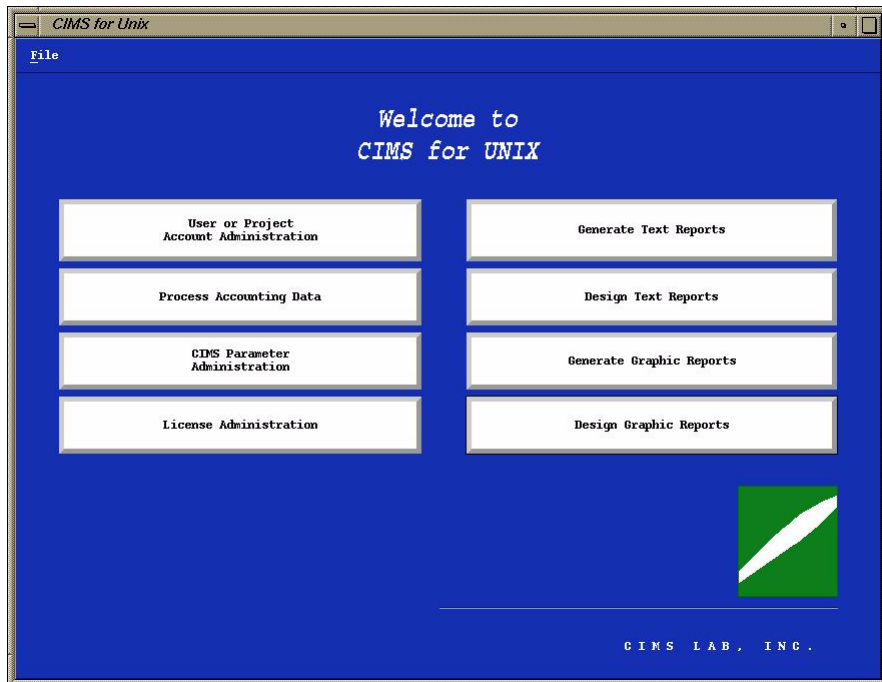

Figure 1-1 • CIMS for UNIX Graphical User Interface (GUI)

The File pull-down menu contains four items: Info, Log, Environment, and Exit.

The `Info` menu item is a pop-up menu that contains two items: `Identify` and `Tech Support`. You select the `Identify` item to display the product version information window. The `Tech Support` item displays a technical support information window.

The `Log` item brings up the `CIMS System Log` display screen (refer to Figure 2-5).

To view and modify the current CIMS for UNIX environment variables the GUI uses, select the `Environment` item. The `A_gui Environment` data entry window is displayed. Figure 1-2 presents the `A_gui Environment` data entry window. Each environment variable has a text field box with its current setting. You modify an environment variable by changing the current setting for the appropriate variable and select the **Apply** or **Exit** button. To just view the variables, select the **Exit** button.

$ARSAP_DATA	/usr/arsap/data/
$ARSAP_BIN	/usr5/users/ernest/arsap/bin/
$ARSAP_DESCR	/usr/arsap/description/
$ARSAP_ACCOUNTING	/arsap_acc/
$ARSAP_ETC	/usr/arsap/etc/
$ARSAP_EXAMPLE	/usr/arsap/examples/

Figure 1-2 • A_gui Environment Data Entry Window

The **Exit** item ends the current CIMS for UNIX GUI session.

The **User or Project Account Administration** and **CIMS Parameter Administration** buttons produce additional menu screens to set up system-wide options and parameters, mapping files and user/project settings, respectively.

The **Process Accounting Data** button provides a comprehensive control window to consolidate the CIMS for UNIX data. This control window performs data consolidation for one or more nodes.

The **License Administration** button administers the necessary license PAKs.

The top two data reporting buttons produce textual reports. The **Generate Text Reports** button generates text reports from your pre-defined Report Description files (RDFs). The **Design Text Reports** button provides control windows to create customized RDFs to meet the specific requirements of your organization.

The bottom two data reporting buttons produce graphical reports. The **Generate Graphic Reports** button generates graphic reports from your pre-defined Graphic Description Files (GDFs). The **Design Graphic Reports** button invokes the CIMS for UNIX Graphic Report Utility (A_graph). A_graph is another CIMS for UNIX GUI tool that produces customized graphic reports that can be saved into GDFs.

A_gui and A_graph are X-window applications implemented with Motif 1.2.5 under X11 R5; therefore, you must have Motif 1.2.5 and X11 R5 or higher installed on your machine to run these applications.

These applications utilize X-application resource files that are delivered with the CIMS for UNIX product. These resource files must be linked to the appropriate X app-defaults directory in order to use the defined resources. Default X-resources are used when the resource files are not used. You can find Link instructions in *Appendix B of the CIMS for NT/ UNIX Reference Guide*.

Another consideration for X-applications is the key symbol mappings that differ from UNIX platform to UNIX platform. Typically, the key symbol mappings for SunOS and Solaris platforms are different. Key symbol mappings for these platforms are conttained in *Appendix B of the CIMS for NT/UNIX Reference Guide.*

The CIMS for UNIX GUI for Solaris platforms contains dynamic Motif library links; therefore, you might have to set the LD_LIBRARY_PATH environment variable to include the directory where Motif is installed on your Solaris platform. This step is necessary when you get error messages indicating that A_gui cannot find some library when you attempt to run it.

A_gui and A_graph are currently available for UNIX only.

Licensing

CIMS for NT/UNIX requires a license on each machine running the CIMS for NT/UNIX utilities and scripts. The CIMS for NT/UNIX License Utility maintains the license information in the CIMS for NT/UNIX Parameter File (A_setup.sys). You must provide the license Product Authorization Key (PAK) during the installation of CIMS for NT/UNIX.

You can add all the licenses on one machine and copy this node's A_setup.sys to the other machines when you have multiple licenses (that is, nodes). CIMS for NT/UNIX references the license in A_setup.sys by nodename. The node is not provided with the license PAK. You must associate the license with the proper node while adding them.

You can update or add more licenses at any time. You can manage the CIMS licenses through the CIMS for UNIX GUI or the CIMS for NT/UNIX CLI.

You select the **License Administration** button from the data entry main menu window (reference Figure 1-1) to manage the CIMS for NT/UNIX licenses. The License Administration menu window is displayed. Figure 1-3 presents the License Administration menu window.
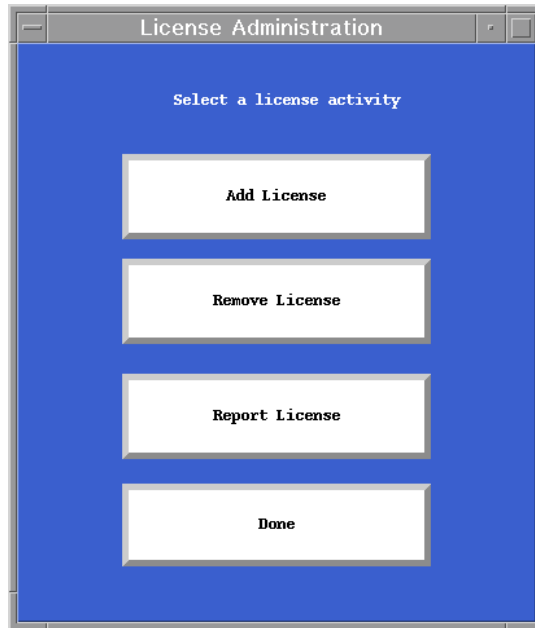
Figure 1-3 • License Administration Menu Window

You select the following buttons in accordance with the desired action:

Add—Add License

Remove—Remove License

Report—Generate License Report

Selecting **Add License** displays the Add License data entry window (see
Figure 1-4). Enter the nodename in the **Node Name** text field box and
enter its CIMS license PAK information into the appropriate text field
boxes.

Figure 1-4 • Add License Data Entry Window

Selecting **Remove License** displays the Remove License data entry window. In **Node Name**, enter the nodename for the node for which you want to remove the CIMS license. Figure 1-5 presents the Remove License data entry window.
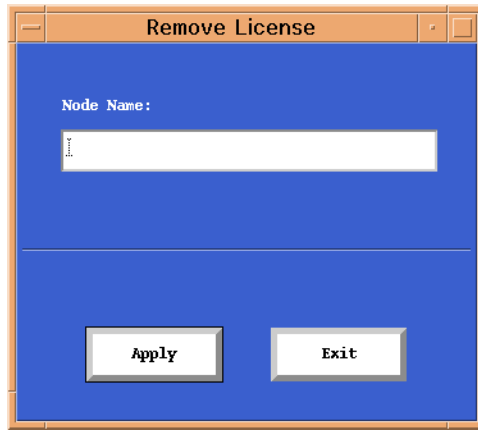
Figure 1-5 • Remove License Data Entry Window

CIMS for NT/UNIX provides scripts to manage the license information through the CIMS for NT/UNIX CLI. These scripts are located in `$ARSAP_HOME/scripts/admin`. There are scripts to add and update the licenses that manage the entire process and build the appropriate CLI commands.

Processing Multiple Nodes

The CIMS for NT/UNIX Process Multiple Node(s) script automates the data consolidation phase for multiple nodes. This script is located in the `ARSAP_ETC` directory. You can invoke this script through the CIMS for UNIX GUI or from a shell prompt. You must enable the system-wide clump support to process multiple nodes. This option lets you attach the node name to the data you are processing for resource or audit reports. In addition, the CIMS for NT/UNIX Node Parameter File (`A_node.par`) must contain the node name of all nodes you want to process.

You process the data using the CIMS for UNIX GUI by selecting **Process Accounting Data** on the main menu (see Figure 1-1). Figure 1-6 presents the Process Accounting Data for Reporting data entry window.

Figure 1-6 • Process Accounting Data for Reporting Window

■ 2

CIMS for NT/UNIX Set-Up

Set-Up Overview

The set-up phase involves customizing CIMS for NT/UNIX features to suit your resource management and chargeback needs. CIMS for NT/UNIX lets you manage these settings to make modifications easily at any time. You select which CIMS for NT/UNIX features to implement by enabling or disabling options and entering parameters. These options and parameters are set using the CIMS for UNIX GUI or through the CIMS for NT/UNIX CLI. CIMS for NT/UNIX feature settings are: system-wide, user/project, mapping files and parameter files.

The CIMS for NT/UNIX Parameter File (`A_setup.sys`) contains the CIMS for NT/UNIX system-wide options and parameters. The system-wide settings affect user and project accounting, capacity planning, data consolidation and data reporting. All CIMS for NT/UNIX utilities utilize `A_setup.sys` to determine the system-wide settings and licensing information. The CIMS for NT/UNIX Setup and License utilities maintain `A_setup.sys`.

The CIMS for NT/UNIX Setup Utility also maintains several mapping files. The CIMS for NT/UNIX Image/Package Mapping File (`A_imgmap.sys`) associates software image names with a software package. The CIMS for NT/UNIX Queue Mapping File (`A_queuemap.sys`) specifies print and batch queues. The CIMS for UNIX Terminal Mapping File (`A_term_par.sys`) distinguishes the terminal names used on the system. The CIMS for NT/UNIX Shift File (`A_shift.sys`) defines shifts. The CIMS for NT/UNIX Holiday File (`A_holiday.sys`) defines observed holidays. The CIMS for NT/UNIX Database Parameter File (`A_dbinst.sys`) specifies the database parameters for database instances.

The CIMS for NT/UNIX Authorization File (`A_uaf.sys`) contains user and project account records. Every user on your system has a user account. When you are using Project Accounting, every project on your system has a project account. Each user and project account in this file contains a number of options and parameters for that user or project. The CIMS for NT/UNIX Authorize Utility maintains `A_uaf.sys`.

The CIMS for NT/UNIX User Validation File (`A_validate.sys`) associates user and projects for pre-authorized project validation. The CIMS for NT/UNIX Authorize Utility maintains `A_validate.sys`.

The CIMS for NT/UNIX Rates File (`A_rates.sys`) contains rate tables which can be designated to specific users and projects. The CIMS for NT/UNIX Rates Utility maintains `A_rates.sys`.

CIMS for NT/UNIX uses other database mapping files. The CIMS for NT/UNIX Database Name File (`A_odb_base.sys`) lists the names of the database instances. The CIMS for NT/UNIX Database User Name File (`A_odb_user.sys`) lists the names of users that have connected to the databases. The CIMS for NT/UNIX Select Utility maintains these files.

CIMS for NT/UNIX also utilizes some parameter files that are maintained by you through a text editor (for example, vi or notepad) unlike the previously mentioned files. The CIMS for NT/UNIX Configuration Parameter file defines environment variables utilized by CIMS for NT/UNIX operational scripts. The CIMS for UNIX Node Parameter File (`A_node.par`) specifies the nodes to be processed by CIMS for NT/UNIX. The CIMS for UNIX Print Parameter File (`A_print.par`) maps a print queue to the accounting file name specified for that print queue. The CIMS for UNIX Storage Parameter File (`A_storage.par`) specifies the UNIX, Redundant Array of Independent Disks (RAID), AFS and Migration filesystems that are to be sampled. The CIMS for UNIX Terminal Parameter File (`A_terminals.par`) designates system terminals.

Some initial settings are important and, when set up properly, can save you work. CIMS for NT/UNIX DEFAULT records contain settings that are propagated to new records. When you change an option or parameter, the change takes effect from that point.

WARNING • When you modify any CIMS for NT/UNIX maintained files without using the appropriate CIMS for NT/UNIX utility, unpredictable behavior can occur. When you make such modifications, we cannot provide technical support.

CIMS for UNIX GUI Set-Up Phase

The CIMS for UNIX GUI presents two main windows for the set-up phase. These windows are invoked by selecting the **CIMS Parameter Administration** and **User** or **Project Account Administration** buttons from the main menu window (reference Figure 1-1). Figure 2-1 presents the CIMS Parameter Administration menu window. Figure 2-2 presents the User or Project Account Administration menu window.

Figure 2-1 • CIMS Parameter Administration Menu Window
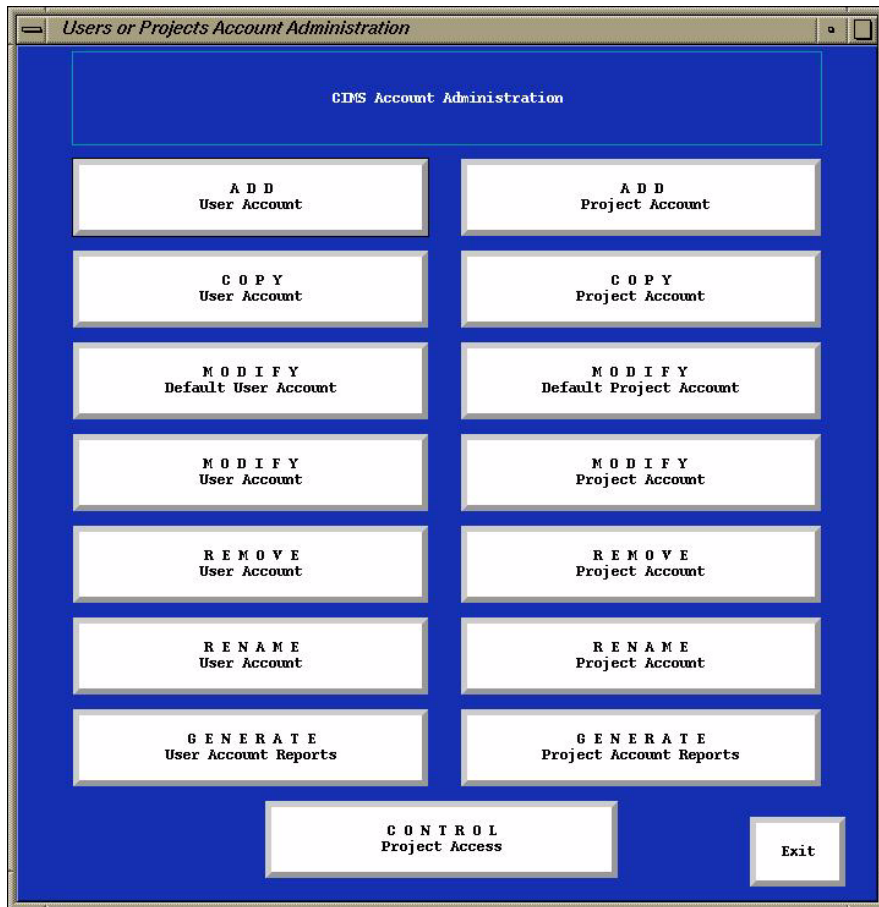
Figure 2-2 • User or Project Account Administration Menu Window

The set-up of the CIMS for UNIX system-wide options and parameters is central to all aspects of the set-up phase. Therefore, the menu window for setting this information is presented here. The Defaults Administration menu window is obtained by selecting **CIMS-System Defaults** from the CIMS Parameter Administration window (reference Figure 2-1). The CIMS System Defaults menu window is obtained by selecting **Administer CIMS-wide System Defaults** from the Defaults Administration window. Figure 2-3 presents the Defaults Administration menu window. Figure 2-4 presents the CIMS System Defaults data entry window.
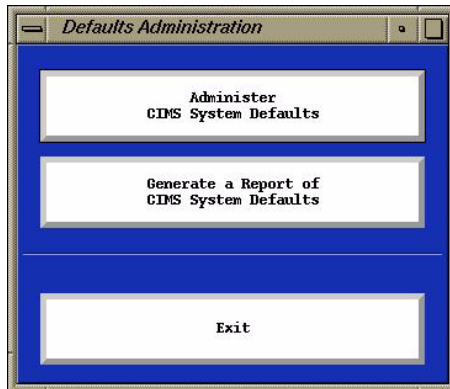
Figure 2-3 • Defaults Administration Menu Window
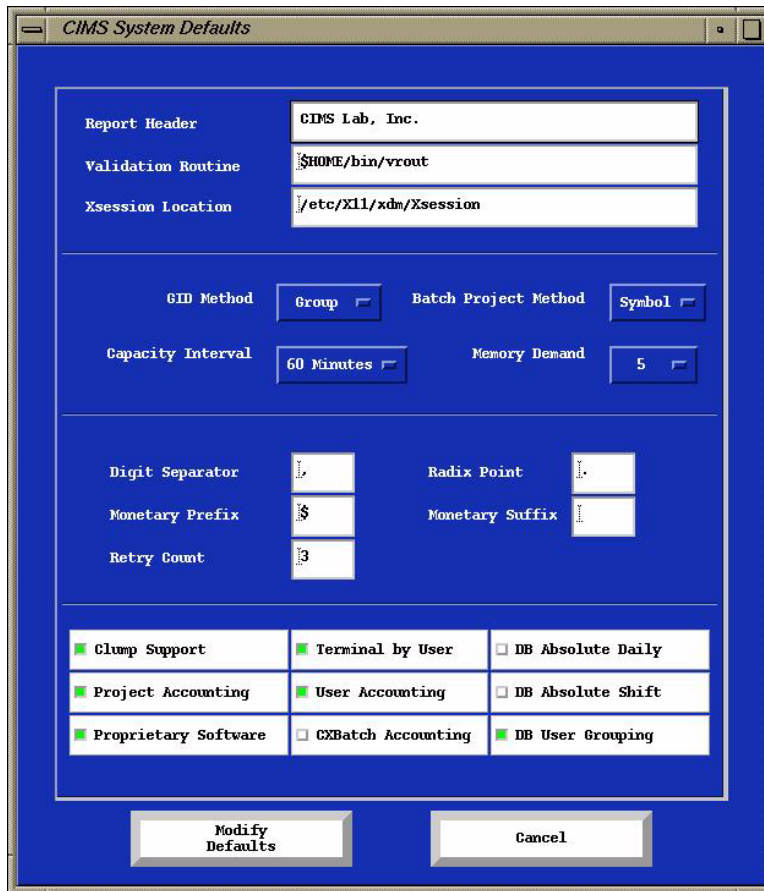
Figure 2-4 • CIMS System Defaults Data Entry Window

The CIMS for UNIX GUI interface consists of various *widgets*. Each widget has a distinct behavior. This behavior is not explicitly described in the proceeding GUI descriptions. You must become familiar with each widget type to assure your actions are as intended. For example, a toggle button indicates the state of an option. When you enable or disable an option, make sure the toggle button indicates the proper state. The option is enabled when the button is depressed. It is disabled when the button is raised.

In addition to these standard widgets, the CIMS for UNIX GUI provides a log screen widget. The CIMS for UNIX GUI displays the log screen to show the results of the commands invoked when you select the **Apply** or **Exit** buttons from a control window. CIMS for UNIX GUI also displays the log screen when you select a reporting button from a menu window. For example, when you select **Generate a Report of CIMS-wide System Defaults** from the Defaults Administration menu window (see Figure 2-3), CIMS for UNIX GUI displays the log screen with a report of the CIMS system-wide options and parameters. Figure 2-5 presents the CIMS System Log display window.

Figure 2-5 • CIMS System Log Display Window

CIMS for NT/UNIX DEFAULT Records

The CIMS for NT/UNIX DEFAULT records are: system-wide, rate table, user, and project. These records should be set up with the overall resource management and chargeback scheme in mind.

The CIMS for NT/UNIX DEFAULT system-wide record is presented in Figure 2-4. The options and parameters for this default record are described in the various set-up chapters.

The DEFAULT rate record is described in the *Rates Set-Up* on page 2-49.

As new users and project accounts are added to the file, new records are added. The initial (or defaults) values for the parameters and options for these new accounts are taken from the DEFAULT user and project account, respectively.

When you explicitly add a new user or project, you can specify different settings of particular options and parameters than what the DEFAULT user or project account contains. But, any options and parameters that you do not explicitly specify are taken from the DEFAULT user or project account.

Note • **When you already have users and/or projects in** A_uaf.sys **and you make a change to the user or project DEFAULT account, you also must change the existing records in order for all users or projects to have the same settings.**

CIMS for NT/UNIX DEFAULT User Record

The CIMS for NT/UNIX DEFAULT user record is a template. When a new user is added, the features set in this record are copied to the new user record. The DEFAULT user record should reflect the settings desired for the majority of user accounts.

For example, when you know that most accounts do not use project accounting (or you want to enable project accounting when establishing individual user accounts), the DEFAULT user account should have Project Accounting disabled.

You set up the DEFAULT user account by selecting **MODIFY Default User Account** from the User or Project Account Administration menu window (see Figure 2-2). The Default User window is displayed. Figures 2-6 through 2-8 presents the Default User window. You toggle the desired options and enter the appropriate parameters from this window. Each option and parameter is defined in an appropriate set-up section.
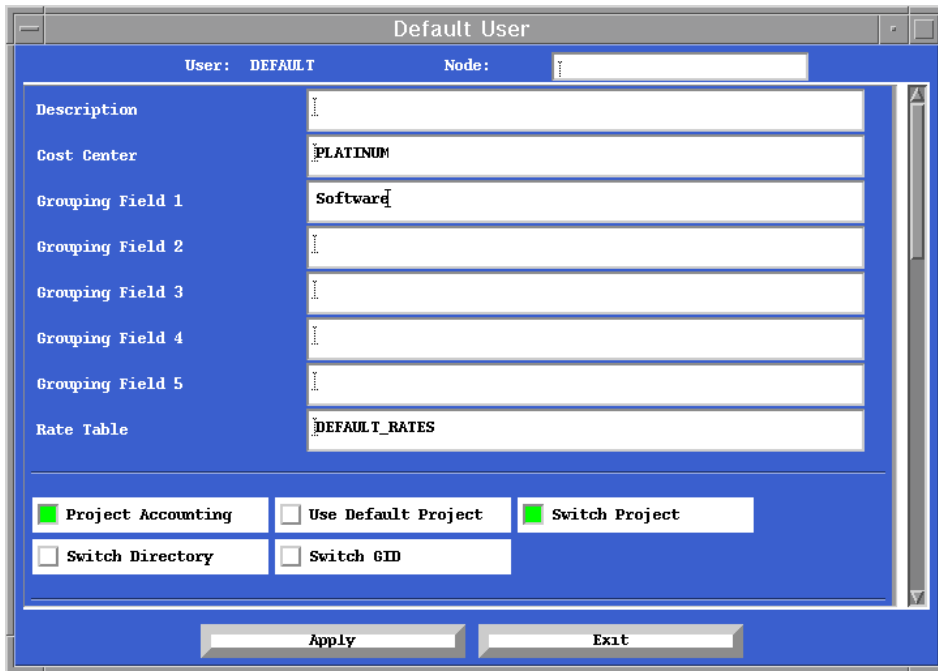
Figure 2-6 • Default User Data Entry Window
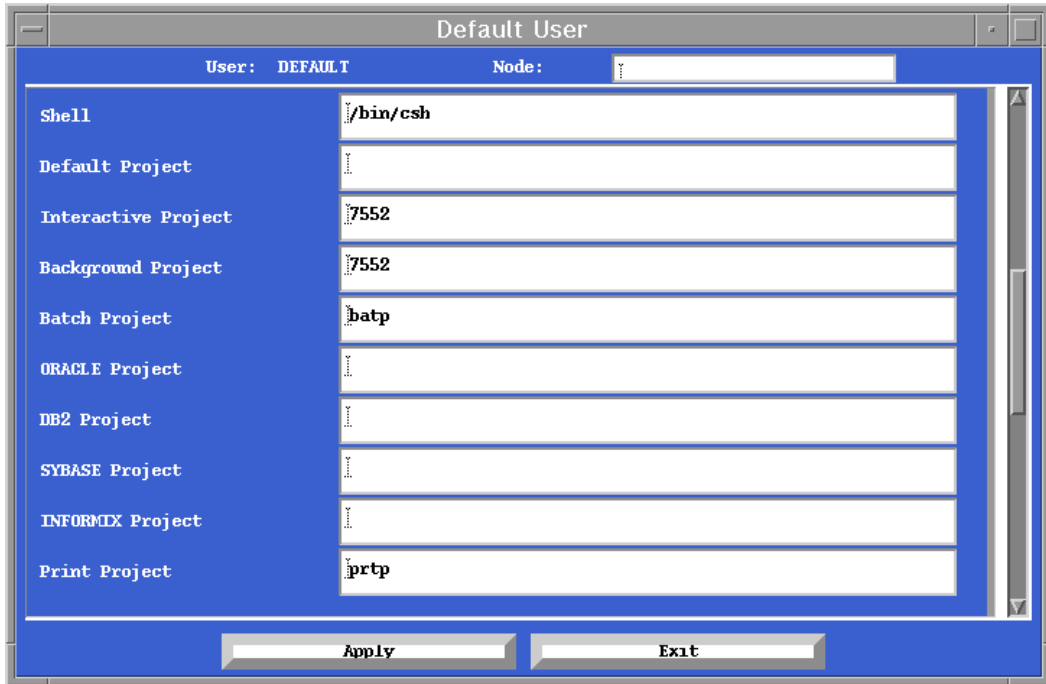
Figure 2-7 • Default User Data Entry Window
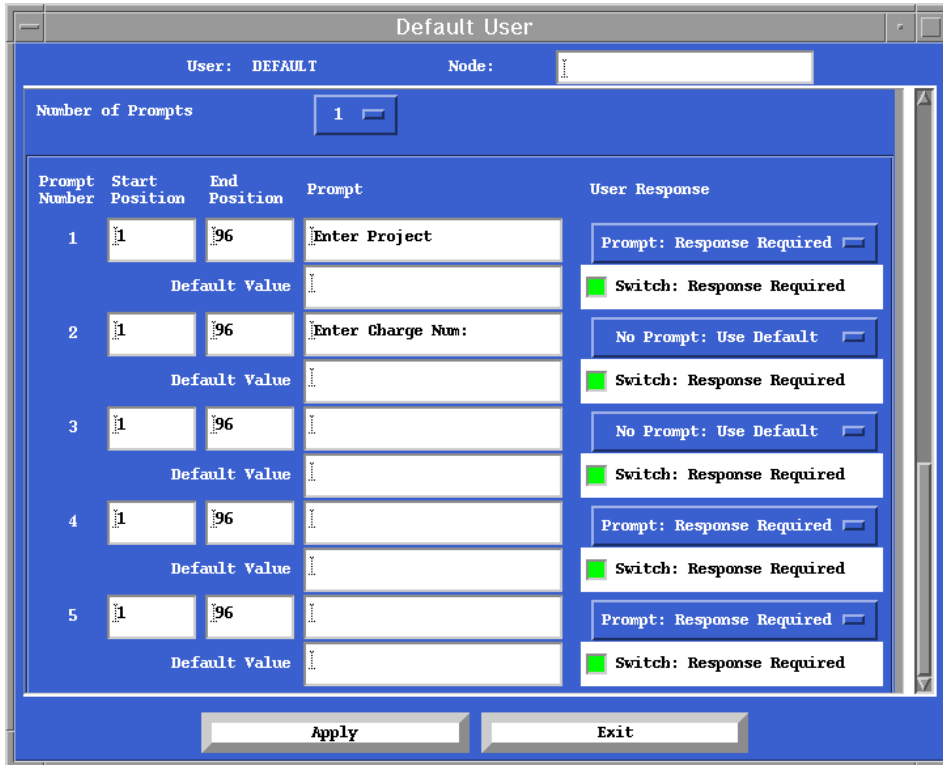
Figure 2-8 • Default User Data Entry Window

CIMS for NT/UNIX DEFAULT Project Record

The CIMS for NT/UNIX DEFAULT project record is a template. When a new project is added, the features set in this record are copied to the new project record. The DEFAULT project record should reflect the settings desired for the majority of project accounts.

You set up the DEFAULT project account by selecting **MODIFY Default Project Account** from the User or Project Account Administration menu window (reference Figure 2-2). The Modify the Default Project window is displayed. Figure 2-9 presents the Modify the Default Project window. You toggle the desired options and enter the appropriate parameters from this window.

Figure 2-9 • Modify the Default Project Data Entry Window

User Accounting Set-Up

The User accounting set-up encompasses adding, copying, modifying, removing, renaming, or reporting user records. When manipulating user records, you use the User or Project Account Administration menu window (reference Figure 2-2) and select the following buttons in accordance with the desired action:

Add—ADD User Account

Copy— COPY User Account

Modify— MODIFY User Account

Remove— REMOVE User Account

Rename— RENAME User Account

Report—GENERATE User Account Reports

When you select **ADD User Account**, the Add User window is displayed. Figures 2-10 through 2-12 present the Add User window.
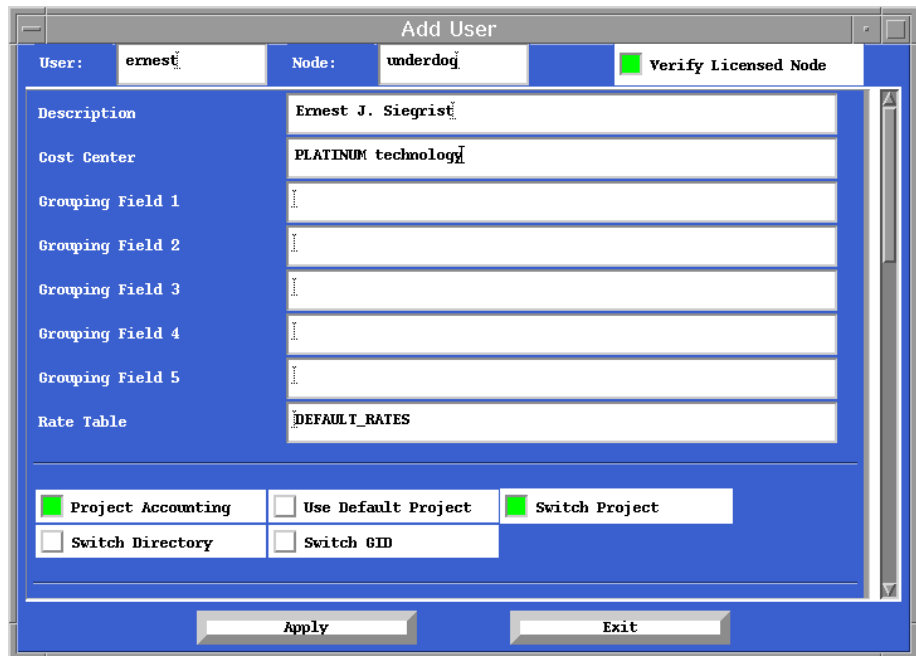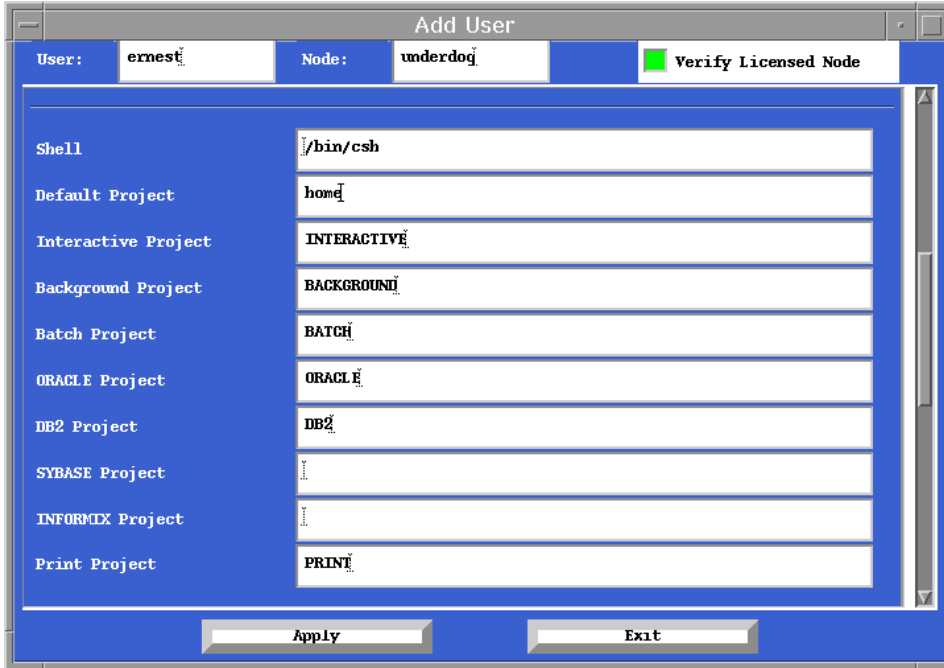
Figure 2-10 • Add User Data Entry Window

Figure 2-11 • Add User Data Entry Window

Add User					
User: ernest		Node: underdog		■ Verify Licensed Node	

Number of Prompts   2 ▭

Prompt Number	Start Position	End Position	Prompt		User Response
1	1	20	Project:		Prompt: Response Required ▭
		Default Value			■ Switch: Response Required
2	21	96	Charge Num:		No Prompt: Use Default ▭
		Default Value			■ Switch: Response Required
3	1	96			No Prompt: Use Default ▭
		Default Value			■ Switch: Response Required
4	1	96			Prompt: Response Required ▭
		Default Value			■ Switch: Response Required
5	1	96			Prompt: Response Required ▭
		Default Value			■ Switch: Response Required

Apply	Exit

Figure 2-12 • Add User Data Entry Window

After providing the appropriate data for copy and modify, a user account window is displayed. The Copy User and Modify User windows are similar to the Add User window (reference Figures 2-10 through 2-12). The **rename** and **remove** commands are performed without further data entry.

Enabling User Accounting

CIMS for NT/UNIX user accounting is required for project accounting, grouping users, and utilizing different rate tables. When you want none of the features, this option should be disabled. Since most sites need this feature, this option is enabled by default.

You enable/disable the system-wide user accounting option by toggling the **User Accounting** button on the CIMS-System Defaults data entry window (see Figure 2-4).

Adding User Accounts

User accounts are added to the CIMS for NT/UNIX accounting system, either automatically by CIMS for NT/UNIX, or manually by the CIMS for NT/UNIX Administrator. Database user accounts must be added manually. Any user parameters not specified when adding a new user account are copied from the DEFAULT user account.

When you want to add user accounts automatically, you must implement the CIMS for NT/UNIX login facility that is described in *Chapter 2, Implementing Project Accounting* of the *CIMS for NT/UNIX Reference Guide*. Automatic user account adding is the simplest and most common practice. During data consolidation, you can use the add accounts feature. Refer to the *CIMS for NT/UNIX Reference Guide, Chapter 4, Select Utility section*.

Do not specify a node name when adding a new user. The node name is utilized when defining a user/node rate table that is described in the Rates Set-Up section in Reporting Parameters Set-Up on page page 2-44.

The length of a username is operating system dependent. Typically, a UNIX username can be from 1 to 8 characters in length. NT lets username be 32 characters in length. The username composition in regard to valid characters and uniqueness is also operating system dependent.

You add a user account through the CIMS for UNIX GUI by selecting ADD User Account from the User or Project Account Administration menu window (see Figure 2-2). The Add User data entry window (see

Figures 2-10 through 2-12) is displayed with the initial settings retrieved from the DEFAULT user account. You enter the new user account name into the User text field box. You toggle the desired options and enter the appropriate parameters from this window.

Any user options and parameters not specified when adding a new user account are copied from the DEFAULT user account.

User Shell

The user shell can contain up to 256 characters. The shell must be a valid UNIX shell. The default shell is /bin/sh and is applied if an invalid shell is specified. The valid character set is alphanumeric and "/" characters.

The user shell is modified by entering the desired, valid UNIX shell into the Shell text field box on the Modify User data entry window (see Figures 2-10 through 2-12).

User Cost Center

The user cost center can contain up to 32 characters. The valid character set is alphanumeric, "$", "_" and "-" characters.

The user cost center is modified by entering the desired cost center into the **Cost Center** text field box on the Modify User menu window (see Figures 2-10 through 2-12).

User Groups

Five user grouping fields are provided for each user account. A grouping field can contain up to 32 characters. The valid character set is alphanumeric, "$", "_", and "-" characters.

You modify the user groups by entering the desired groups into the appropriate group field on the Modify User data entry window (reference Figures 2-10 and 2-12). For example, you could enter "Technical Support" into **Grouping Field 1** text field box and "Sales Department" into **Grouping Field 2** text field box.

The database user grouping feature provides a means of grouping database users. When you want to use the database user grouping feature, you need to enable the system-wide database user grouping option.

You enable or disable this option by toggling DB User Grouping on the CIMS System-Wide Parameters data entry window (see Figure 2-4).

User Description

The user description can contain up to 32 characters. The valid character set is the ASCII character set.

You modify the user description by entering the desired description into the **Description** text field box on the Modify User data entry window (reference Figures 2-10 through 2-12).

User Rate Tables

The Rates Set-Up section in *Reporting Parameters Set-Up* on page 2-44 describes how rate tables are set up for a user account .

Project Accounting Set-Up

Project accounting set-up encompasses adding, copying, modifying, removing, renaming, or reporting project records. In addition, you must implement the CIMS for NT/UNIX login and switch facilities that are described in *Chapter 2, Implementing Project Accounting* in the *CIMS for NT/UNIX Reference Guide*.

When manipulating project records, you use the User or Project Account Administration menu window (see Figure 2-2) and select the following buttons in accordance with the appropriate action:

Add—ADD Project Account

Copy—COPY Project Account

Modify—MODIFY Project Account

Remove—REMOVE Project Account

Rename—RENAME Project Account

Report—GENERATE Project Account Reports

When you select **ADD Project Account**, the Add Project window is displayed. Figure 2-13 presents the Add Project window.

Figure 2-13 • Add Project Data Entry Window

When you select the copy, modify, remove, rename, or report command, an appropriate data entry window is display. When you select **MODIFY Project Account**, the Modify Project... data entry window is displayed. Figure 2-14 presents the Modify Project... data entry window. The other data entry windows are similar to this window.
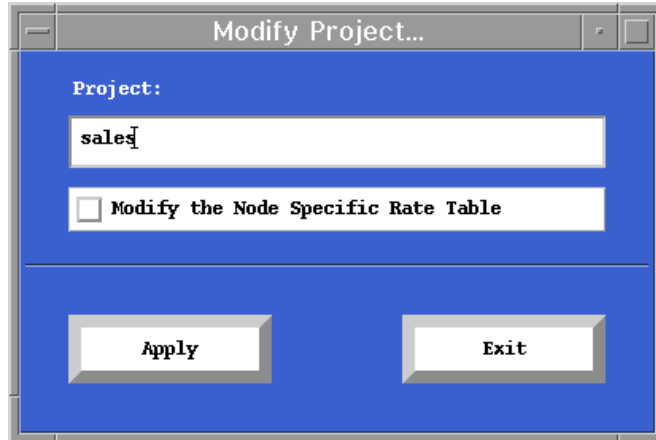
Figure 2-14 • Modify Project... Data Entry Window

After providing the appropriate data for copy and modify, a project account window is displayed. The Copy Project and Modify Project windows are similar to the Add Project window (reference Figure 2-13). The rename and remove commands are performed without further data entry.

Enabling Project Accounting

CIMS for NT/UNIX project accounting is enabled through a system-wide option and a user account option. When you are implementing project accounting, the system-wide option must be set. The user account option is set for those users that require project accounting. By default, these options are disabled.

You enable/disable the system-wide project accounting option by toggling the **Project Accounting** toggle button on the CIMS-System Defaults data entry window (see Figure 2-4).

You enable or disable the user account project accounting option by toggling the **Project Accounting toggle** button on the Add User window (see Figures 2-10 through 2-12).

Adding Project Accounts

Project accounts should be added to the CIMS for NT/UNIX accounting system manually by the CIMS for NT/UNIX Administrator. Project accounts can be added automatically under the No Validation project access method that is an undesirable project validation method (See *No Validation* on page 2-34 in this chapter).

You add a project using the CIMS for UNIX GUI by selecting **Add Project** from the User or Project Account Administration menu window (see Figure 2-2). The Add Project window (see Figure 2-13) is displayed with the initial settings retrieved from the DEFAULT project. You enter the new project name into the **Project** text field box. You toggle the options and enter the appropriate parameters from this window.

Do not specify a node name when adding a new project. The node name is utilized when defining a project/node rate table that is described in *Reporting Parameters Set-Up* on page 2-44.

Since the notion of projects is the creation of CIMS for NT/UNIX, the project name composition in regard to valid characters and uniqueness is under the control of CIMS for NT/UNIX. A project name contains from 1 to 96 characters. The valid character set is alphanumeric, ".", "_" and "-" characters.

Any project options and parameters not specified when adding a new project are copied from the DEFAULT project.

User Default Project

You implement a user default project by enabling the **Default Project** toggle button and entering a valid project for this user into the **Default Project** text field box on the Add User data entry window (see Figures 2-10 through 2-12). By default, the default project option is enabled.

User Default Jobtype Projects

You designate default jobtype projects for a user by entering a valid project name for this user into the appropriate jobtype project text field box on the Add User data entry window (see Figures 2-10 through 2-12). The jobtype project text field boxes are:

interactive—"Interactive Project"

background—"Background Project"

batch—"Batch Project"

print—"Print Project"

Oracle—"Oracle Project"

IBM DB2—"DB2 Project"

Project Switching

In order to enable project switching for a user, you must enable project switching in the user account and in the projects to which the user needs to switch. You must consider two factors about the nature of the project when switching projects: project GID (UNIX only) and project directory. Refer to *Project GID* on page 2-27 for project GID settings. Refer to *Project Default Directory* on page 2-28 for project directory settings.

You enable project switching for a user by enabling the **Project Switch** toggle button on the Add User data entry window (reference Figures 2-10 through 2-12). You enable project switching for a project by enabling the **Project Switch** toggle button on the Add Project data entry window (see Figure 2-13).

Project GID

CIMS for UNIX lets you control the GID associated with a project. You do not have to define the GID in the /etc/group file. You can associate a GID with a project by specifying a GID and enabling switch GID. In order to change the user's GID to the project GID, you must enable switch GID in the project account and in the user account. When you don't want a project GID, you enable revert GID to utilize the user's primary GID from the UNIX passwd file. By default, the revert GID option is enabled, and switch GID options are disabled.

You designate a project GID by entering the GID into the **Project GID** box and enabling switch GID for a project by enabling the **Switch GID** toggle button on the Add Project data entry window (see Figure 2-13). You toggle the **Revert GID** toggle button from this window, too. You enable switch GID for a user by enabling the **Switch GID** toggle button on the Add User data entry window (see Figures 2-10 through 2-12).

Project Default Directory

You can designate a default directory for a project by identifying a directory and enabling switch directory. You are not restricted to this directory. It is simply the home directory of the project. In order to change to this project directory, you must enable switch directory in the project account and in the user account. When you don't want a project directory, you enable revert directory to utilize the user's home directory from the UNIX passwd file. By default, the revert directory option is enabled, and switch directory options are disabled.

You designate a project directory by entering the directory into the **Project Directory** text field box and enabling switch directory for a project by enabling the **Switch Directory** toggle button on the Add Project data entry window (see Figure 2-13). You toggle the **Revert Directory** toggle button from this window, too. You enable switch directory for a user by enabling the **Switch Directory** toggle button on the Add User data entry window (see Figures 2-10 through 2-12).

Project Cost Center

The project cost center can contain up to 32 characters. The valid character set is alphanumeric, "$", "_" and "-" characters.

You designate a project cost center by entering the cost center into the **Cost Center** text field box (see Figures 2-10 through 2-12).

Project Groups

Five project grouping fields are provided for each project account. Each grouping field can contain up to 32 characters. The valid character set is alphanumeric, "$", "_" and "-" characters.

You designate project groups by entering the groups into the appropriate group field (see Figures 2-10 through 2-12). For example you would enter Technical Support into the **Grouping Field 1** text field box and Sales Department into **Grouping Field 2** text field box.

Project Description

The project description can contain up to 32 characters. The valid character set is the ASCII character set.

You designate a project description by entering the description into the **Description** text field box (see Figure 2-10).

Project Time Limit

You impose a time limit on a project by supplying a start time and an end time. These time limits are in the form DD-MMM-YYYY (for example, 15-APR-1997). The start time begins at 00:00:00 and end time terminates after 23:59:59 of the specified day. You enter NONE to clear the time limit.

You designate a project time limit by entering the time limit into the **Time Limit** text field box (reference Figure 2-10).

Project Validation

You can control user access to project accounts with project validation. CIMS for NT/UNIX has five levels of project validation:

■ Validation by user account authorization (USERPROJ)

■ Validation by password (PASSWORD)

■ Custom validation (CUSTOM)

■ Validation by project name existence

■ No validation

You can use any combination of USERPROJ, PASSWORD and CUSTOM. When a combined control access is used, the order of precedence is: USERPROJ, PASSWORD and CUSTOM. You can achieve a more secure level of access control by using a combination of these access control methods.

CIMS for NT/UNIX provides a failsafe mechanism for project validation. Under UNIX, root can gain access regardless of the project validation method. Under NT, Administrator can gain access regardless of the project validation method.

Validation Retry

You can allow any number of project validation retries. The retry count applies to any validation method except no validation. Validation retry count is an CIMS system-wide parameter. The default retry count is 3.

You specify the validation retry count by entering the numeric value into the **Validation Retry Count** text field box on the CIMS-SystemDefaults data entry window (reference Figure 2-4).

Validation By User Account Authorization

CIMS for NT/UNIX validates the project under User Account Authorization by comparing user/project pairings. Each project for which this method is used has a list of users that have privilege to access this project. When the user is not a member of the list, CIMS for NT/UNIX denies the user access. The user can enter "?" at the prompt to display the projects for which that user is authorized.

You must have user accounts and project accounts defined before creating user/project combinations. You can use a wildcard (*) to designate all projects to a user.

You specify the user account authorization method by enabling the **User/Project Validation Method** and **Project Validation** toggle buttons on the Add Project data entry window (see Figure 2-13). You add a user/project authorized pairing by selecting the **CONTROL Project Access** button from the User or Project Account Administration menu window (see Figure 2-2). The Project Validation menu window is displayed. Figure 2-15 presents the Project Validation menu window.
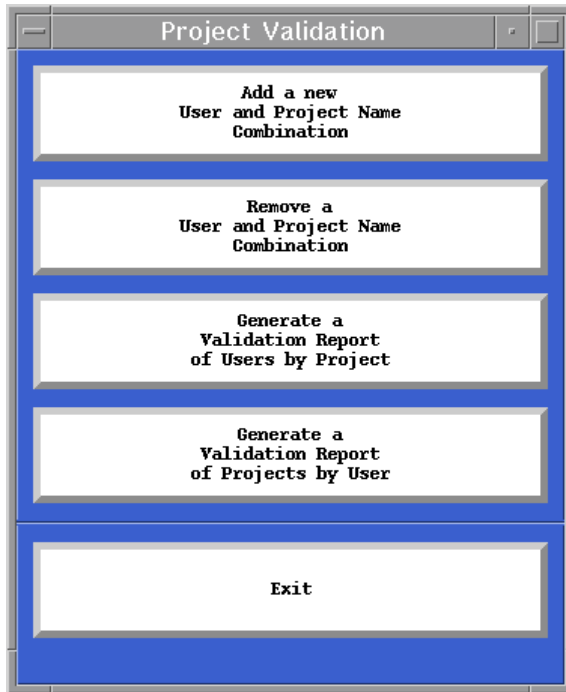
Figure 2-15 • Project Validation Menu Window

You can choose to add, remove or report user/project pairings. When you choose **Add a new User and Project Name Combination**, the Add Validation data entry window is displayed. Figure 2-16 presents the Add Validation data entry window. You enter the appropriate user account and project.
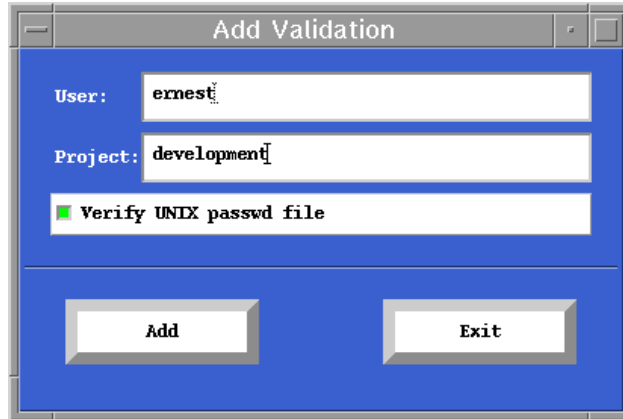
Figure 2-16 • Add Validation Data Entry Window

Validation by Password

The project account is password protected. The user must provide the valid password for the project. The project password is defined in the project record. When the user inputs the password, the password is not echoed.

You specify the password method by enabling the **Password Validation Method** and **Project Validation** toggle buttons and entering a password into the **Password** data entry box on the Add Project data entry window (see Figure 2-13).

Custom Validation Method

The CIMS for NT/UNIX custom validation feature lets you build a project validation routine that performs validation exceeding the validation methods provided by CIMS for NT/UNIX. When using custom validation, you do not need to add each account. You need to set up only the DEFAULT user and project records.

CIMS for NT/UNIX passes the user name, project name, and optional password to the routine that has been defined by the system-wide parameter. A return value of 0 from the validation routine indicates the user has been successfully validated for the project and access to the project is allowed. Any other return value indicates a failure, and access is denied. In this case, an error message containing the return value is displayed to the user.

The main declaration in the source code for your validation routine should appear as follows:

main(int argc, char **argv)

You specify the custom method by enabling the **Custom Validation Method** and **Project Validation** toggle buttons on the Add Project data entry window (see Figure 2-13). You specify the custom validation routine by entering the name of the routine including the path into the **Validation Routine** text fields box on the CIMS System-Wide Parameters data entry window (see Figure 2-4).

Validation by Project Existence

The project account must exist. This ensures that only existing projects can be accessed. No other verification is performed. This method assumes that when a user knows a valid project name, then that is sufficient authorization to access the project.

You specify the project existence method by enabling the **Project Validation** toggle button and disabling the toggle buttons for all validation methods on the Add Project data entry window (see Figure 2-13).

No Validation

CIMS for NT/UNIX performs no validation checking with this method. Anything the user provides is accepted as a valid project as long as the project name meets naming requirements. If the project does not exist, a record is added to the CIMS for NT/UNIX Autorization File. This method is not recommended since input such as typographical errors, or random input from the user in response to the project prompt is accepted as a valid project. In addition, these project names are propagated to other CIMS for NT/UNIX files and CIMS for NT/UNIX does not provide a mechanism to correct these project names.

The most common use of this option is inside a UNIX script file that creates a special user environment. For example, suppose you had a UNIX script that presents a menu to the user and performs some actions based on the option picked by the user. You want to be able to track how many and which users use each option.

To do this, you could retrieve the user's username and append it to the menu option that the user selected, creating a new project name. Once you have this, you could create a new project account by switching to it.

You specify no project validation by disabling the **Project Validation** toggle button and disabling the toggle buttons for all validation methods on the Add Project data entry window (see Figure 2-13).

Project Rate Tables

Rates Set-Up on page 2-49 describes how rate tables are set up for projects.

Image Accounting Set-Up

Image accounting set-up involves enabling the system-wide proprietary software option and defining software packages. CIMS for NT/UNIX uses the proprietary software option to match a software image to a defined package. A software package consists of a set of software programs. The CIMS for NT/UNIX Image Mapping File (A_imgmap.sys) contains the software package definitions.

You must define the software packages you want to track. When you first install CIMS for NT/UNIX, there are no packages defined in A_imgmap.sys. You can define them at any time, but you must perform data consolidation after you set up a package (see *Data Consolidation Overview* on page 4-2). There are some rules you should follow when defining software packages.

You also can assign different rates to software packages. *Rates Set-Up* on page 2-49 describes how to establish rates for software packages.

Enabling Proprietary Software

By default, the Proprietary Software option is disabled.

You enable/disable the system-wide proprietary software option by toggling the **Proprietary Software** toggle button on the CIMS-System Defaults data entry window (see Figure 2-4).

Defining Software Packages

Software package definition encompasses adding, removing or reporting software packages. When mapping images to software packages, you choose **Define Software Packages** from the CIMS Parameter Administration menu window (see Figure 2-4). The Image Administration menu window is displayed. Figure 2-17 presents the Image Administration menu window. You select the following buttons in accordance with the appropriate action:

■ Add—Add an Image Name to a Software Package

■ Remove—Remove an Image Name from a Software Package

■ Report—Generate Report Software Package by Image Name or Generate Report Image Name by Software Package
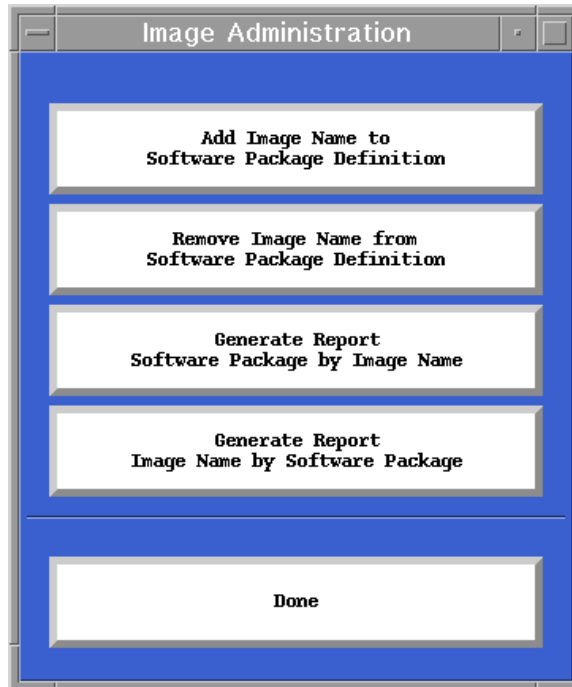
Figure 2-17 • Image Administration Menu Window

When you select **Add an Image Name to a Software Package**, the Add an Image Name data entry window is displayed. Figure 2-18 presents the Add an Image Name data entry window. You enter the image name in the Add image name: text field box and specify the appropriate package in the To package name: text field box.
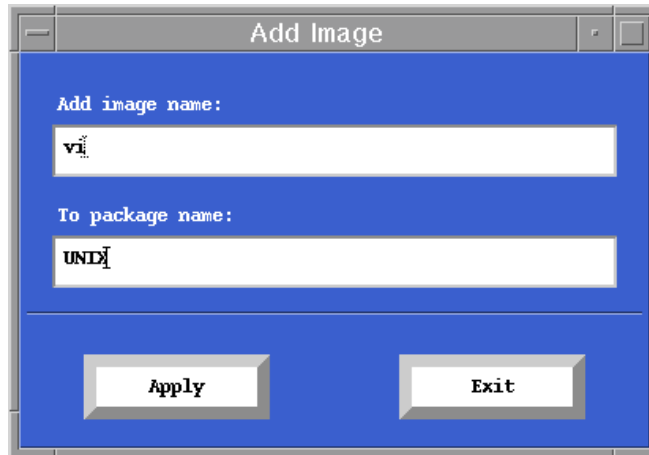
Figure 2-18 • Add Image Data Entry Window

When you select **Remove**, the Remove Image data entry window is displayed. Figure 2-19 presents the Remove Image data entry window.
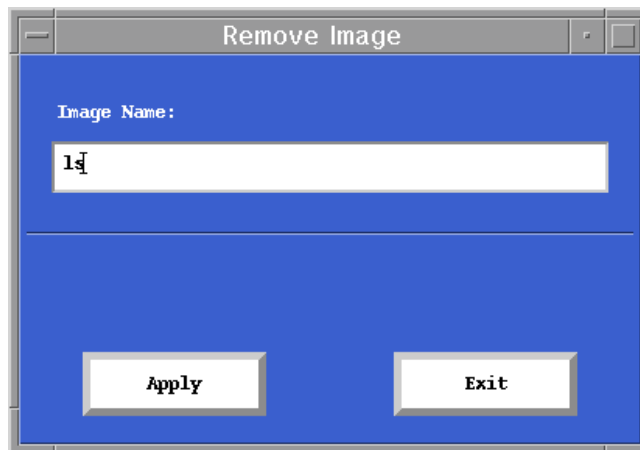
Figure 2-19 • Remove Image Data Entry Window

Image Mapping Rules

You must first gather the names of the images that make up your software package. There might be a bin directory for the package from which you can get the image names. You also might need to refer to a script that you execute to run the software package to find the image name.

When you are ready to map images, keep the following rules in mind:

■ You use the first 8 characters of the image name, with no path. Image names are case sensitive.

■ You can use 32 characters for package names, with no spaces.

■ When you want image time (wall clock time), you might only want to map the executable that "drives" the product.

■ When you want CPU time, you want to map all executables for that package.

■ Wildcards are permitted for image names. For example, A_* can be mapped to report on the utilities that make up the CIMS package.

■ Careful naming of packages can result in nice reports:

```
A_gui    −>CIMS_gui
A_graph  −>CIMS_graph
A_author −>CIMS_authorize
```

Reporting on CIMS* produces a bottom line total for the CIMS for NT/UNIX product, plus totals for the individual components of CIMS for NT/UNIX.

Database Accounting Set-Up

The considerations for setting up database accounting are:

■ Setting CIMS for NT/UNIX parameters that specify the database user/password and sample rate

■ Setting CIMS for NT/UNIX options for absolute shift and daily accounting

■ Starting the CIMS for NT/UNIX database accounting daemon.

The first two steps are database dependent and probably need to be performed by the Database Administrator (DBA).

You set up the CIMS for NT/UNIX database parameters. The CIMS for NT/UNIX Database Parameters File (A_dbinst.sys) maintains these parameters. When CIMS for NT/UNIX records the password into A_dbinst.sys, the password is encrypted. The sample frequency rate defines the rate at which CIMS for NT/UNIX samples the database accounting information. This rate is in seconds where the default is 300.

You manage the CIMS for NT/UNIX database parameters by selecting **DB Instance Parameters** from the CIMS Parameter Administration menu window (see Figure 2-4). The DBinst Administration menu window is displayed. Figure 2-20 presents the DBinst Administration menu window. You select the following buttons in accordance with the appropriate action:

Add—Add DB Instance

Modify—Modify DB Instance

Remove—Remove DB Instance

Report—Generate DB Instance Report
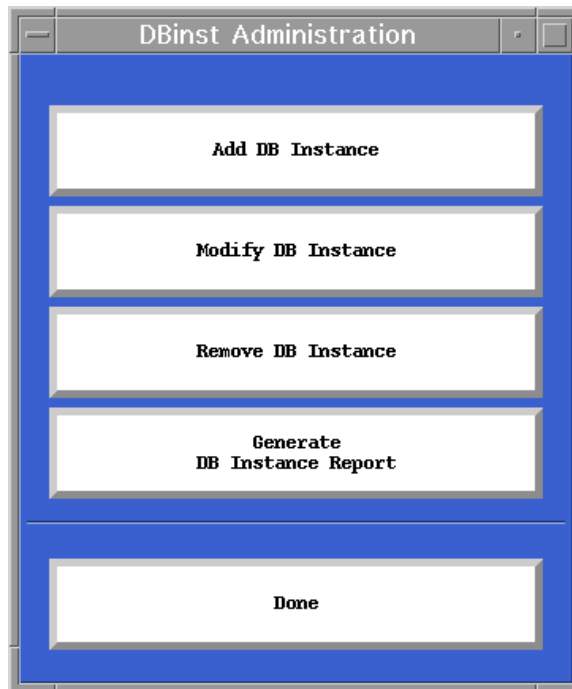
Figure 2-20 • Dbinst Administration Menu Window

You add a new database setting by selecting **Add DB Instance** that brings up the Add DB Instance window. Figure 2-21 presents the Add DB Instance window. You enter the parameters into the appropriate text field boxes: database name (for example, Oracle instance) into **DB Instance**, the database user/password into **DB Username** and **DB Password**, respectively, and the sample frequency rate into **Frequency**. You choose the type of database to which these parameters pertain by setting the **DB Type** radio button.
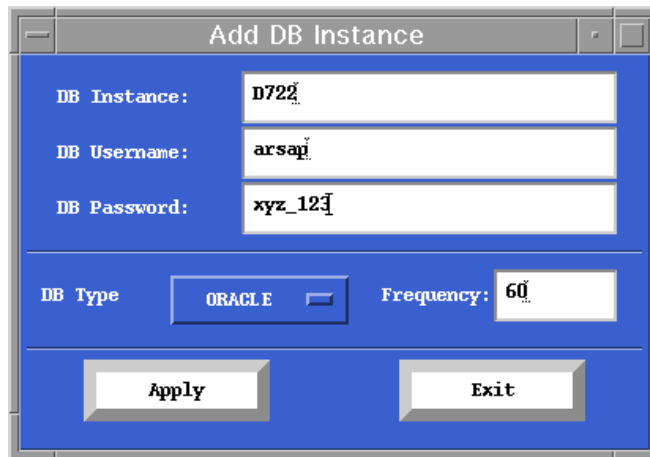
Figure 2-21 • Add DB Instance Data Entry Window

When you select modify or remove, an appropriate data entry window is
displayed. When you select **Modify DB Instance**, the Modify DB Instance
data entry window is displayed. Figure 2-22 presents the Modify DB
Instance data entry window. The Remove DB Instance data entry window
is similar to this window.
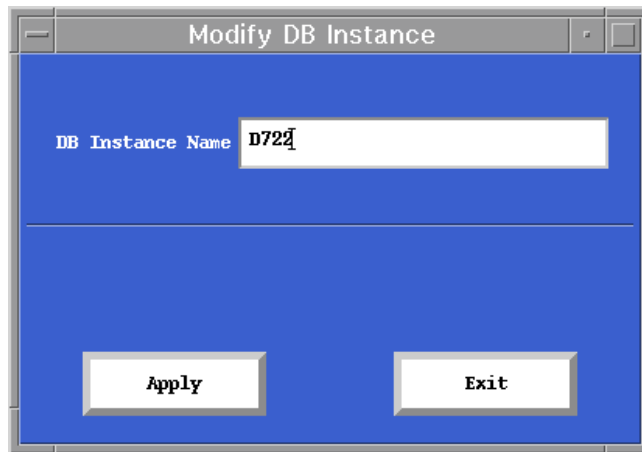
Figure 2-22 • Modify DB Instance Data Entry Window

The database absolute shift and daily accounting feature specifies that database system accounting data be collected on shift and daily boundaries, respectively. When you want to use the database absolute shift accounting feature, you need to enable the system-wide database absolute shift accounting option. When you want to use the database absolute daily accounting feature, you need to enable the system-wide database absolute daily accounting option.

You enable and disable these options by toggling DB Absolute Shift and DB Absolute Daily on the CIMS-System Defaults data entry window (see Figure 2-4).

Reporting Parameters Set-Up

Some of the CIMS for NT/UNIX features are utilized only during the data consolidation and reporting phases. Unlike project accounting or database accounting, you do not have to set up these features immediately. These features consist of options and parameters. This section discusses CIMS for NT/UNIX reporting parameters and how they are selected.

The CIMS for NT/UNIX data consolidation and reporting features are:

- Terminal by User

- Capacity Interval

- Rates

- Shifts

- Holidays

- Output Queues

- GID-Method

- Report Header

- Digit Separator

- International Reporting Features

- Memory Demand Algorithm

- Monetary Symbols

- Radix Point

Terminal-by-User Set-Up

Terminal-by-User set-up involves enabling the system-wide terminal-by-user option and defining terminal names. The CIMS for UNIX Terminal Parameter File (A_term_par.sys) contains the terminal definitions. When you first install CIMS for UNIX, the DEFAULT terminal is added to A_term_par.sys. The CIMS for UNIX Select Utility automatically adds new terminal names to this file while processing CIMS for UNIX accounting data.

You must define the terminal names you want to track. You can define them at any time, but you must perform data consolidation after you set up a terminal (refer to *Data Collection Overview* on page 3-2).

You also can assign different rates to terminals. The Rates Set-Up section on page 2-49 describes how to establish rates for terminals.

Enabling Terminal-by-User

You enable or disable the system-wide terminal-by-user option by toggling the **Terminal by User** toggle button on the CIMS System-Wide Parameters data entry window (see Figure 2-4).

Adding Terminal Definitions

You manage the CIMS for UNIX terminal definitions by selecting the **Terminal Definitions** button from the CIMS Parameter Administration menu window (see Figure 2-4). The Terminal Administration menu window is displayed. Figure 2-23 presents the Terminal Administration menu window. You select the following buttons in accordance with the appropriate action:

Add/modify—Add/Modify a Terminal Definition

Remove—Remove a Modify a Terminal Definition

Modify default record—Modify the Default Terminal Definition

Report—Generate Terminal Definition Report
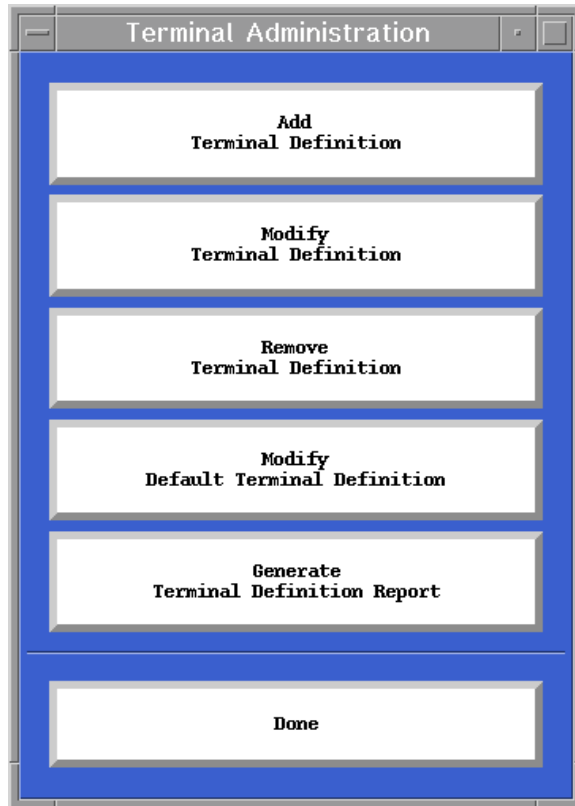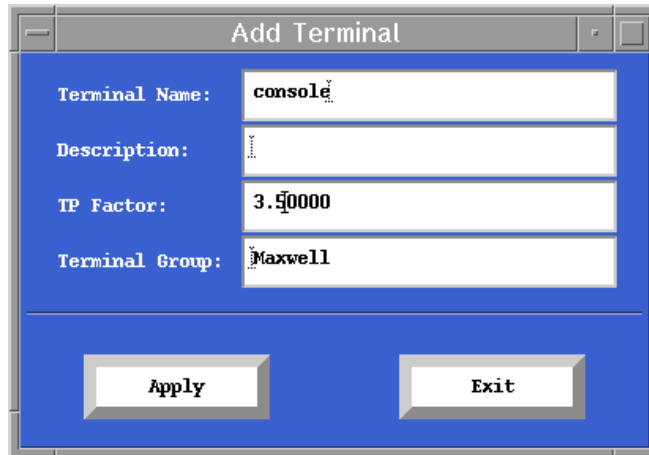
Figure 2-23 • Terminal Administration Menu Window

When you select the **Add a Terminal Definition** button, the Add Terminal data entry window is displayed. Figure 2-24 presents the Add Terminal data entry window.

Figure 2-24 • Add Terminal Data Entry Window

When you select modify or remove, an appropriate data entry window is displayed. When you select **Modify Terminal Definition**, the Modify Terminal Definition data entry window is displayed. Figure 2-25 presents the Modify Terminal Definition data entry window. The Remove Terminal Definition data entry window is similar to this window.
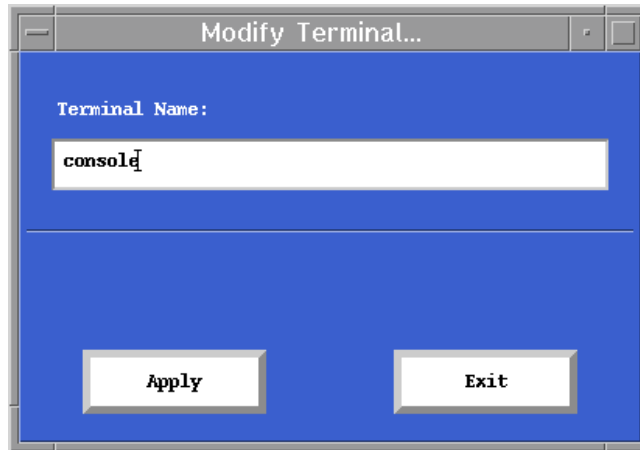
Figure 2-25 • Modify Terminal Data Entry Window

Capacity Interval Set-Up

The capacity interval sets the time interval at which capacity reporting information is generated. The smaller the interval, the greater the granularity of the capacity information produced that also determines the size of the CIMS for NT/UNIX Capacity File generated. The interval must divide evenly into an hour that makes the valid interval values: 5, 6, 10, 15, 20, 30, or 60. The interval is expressed in minutes and is set to 60 by default.

You specify the capacity interval by selecting the appropriate value from the **Capacity Interval** radio button on the CIMS System-Wide Parameters data entry window (see Figure 2-4).

Rates Set-Up

Rates are applied to the statistics that have been collected (for example, CPU minutes) to either calculate charges for resource usage, or as a factor to normalize data between different types of machines.

The rate tables are broken up into the different CIMS for NT/UNIX jobtypes. Within each jobtype record, you can assign rates to shifts, terminals, batch, and print queues when those categories apply to that jobtype (for example, there is no terminal record for the background jobtype). You can charge a different rate for CPU used by an interactive job as opposed to a background job.

The job types and the element(s) for which you can set special rates for each are as follows:

interactive—shift, terminal

background—shift

batch—shift, queue

db2—shift, database name

oracle—shift, database name

package—shift, package name

print—queue

storage—

There are many approaches to using rates in CIMS for NT/UNIX. You can use the DEFAULT_RATES table for all nodes, users, and projects. Conversely, you can create new rate tables to apply different rates to nodes, users, or projects. The DEFAULT_RATES record is applied when no other action is taken. When you want to apply other rate tables, there are two approaches.

The first approach is to apply the rates in the report description file (RDF) by specifying a rate table name. Refer to *Report Description Files* in the *CIMS for NT/UNIX Reference Guide*.

The second approach for assigning rates is to apply different rates for different nodes, users, or projects by establishing rate tables for each class of node, user, or project. You apply the rate tables to the node record for the DEFAULT user and/or project by using the CIMS for NT/UNIX Authorization Utility. You can also apply a rate table to the node record in an individual user or project account.

As you generate the charges report, the CIMS for NT/UNIX Report Utility checks the user or project record for the node record associated with the statistics for which charges are being calculated. When no node record exists for that user or project account, the CIMS for NT/UNIX Report Utility checks the DEFAULT user or project account for a node record. When the node record exists, the rate table specified in the record is used. When no node record exists the DEFAULT_RATES are used.

You choose **Rate Tables** from the CIMS Parameter Administration menu window (see Figure 2-1) to manage the rate tables. The Rate Tables menu window is displayed. Figure 2-26 presents the Rate Tables menu window.
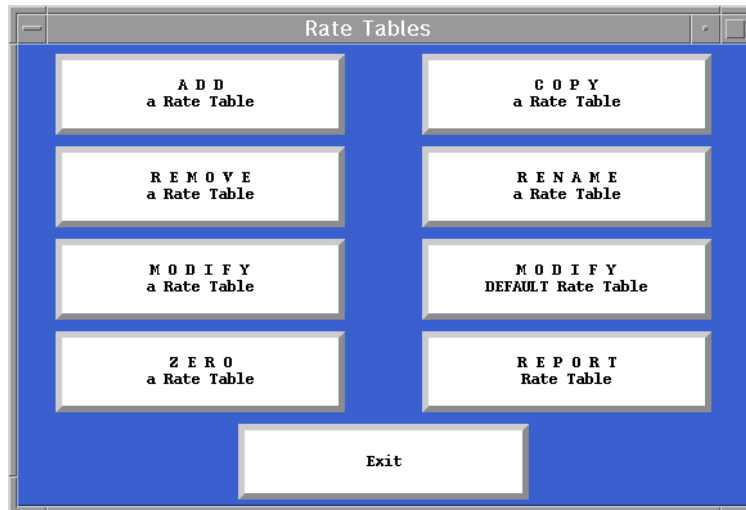
Figure 2-26 • Rate Tables Menu Window

You select the following buttons in accordance with the appropriate action:

Add—Add a Rate Table

Copy—Copy a Rate Table

Modify—Modify a Rate Table

Modify default—Modify DEFAULT Rate Table

Remove—Remove a Rate Table

Rename—Rename a Rate Table

Zero—Zero a Rate Table

You must first establish the DEFAULT_RATES table before you can add any rate tables.

CIMS for NT/UNIX DEFAULT Rate Table

The CIMS for NT/UNIX DEFAULT rate table is a template and must be created first. When a new rate table is added, the rates set in this record are copied to the new rate table. The DEFAULT_RATES table should reflect the rates appropriate for the majority of your rate tables. When CIMS for NT/UNIX is installed, the DEFAULT_RATES table that contains preliminary rates, is created.

You select the **MODIFY DEFAULT Rate Table** button from the Rates Table menu window (see Figure 2-26) to display the Default Rate Table data entry window. Figure 2-27 presents the Default Rate Table data entry window.

Figure 2-27 • Default Rate Table Data Entry Window

You choose the jobtype you want to modify from the **Job Type** radio button. The elements that you can enter are dependent on the selected jobtype. The initial value for the element(s) is <Default>. For example, the shift and terminal text field boxes are active for the interactive jobtype and all others are grayed out. You select the **Apply** or **Done** button and the Modify Rate Table data entry window for the DEFAULT_RATES table is displayed. Figure 2-28 presents the Modify Rate Table data entry window for DEFAULT_RATES.

Figure 2-28 • Modify DEFAULT_RATES Table Data Entry Window

You modify the rates for each statistic from the Modify Rate Table data entry window. For example, when you want to specify a rate for user CPU minutes, enter the value in the **ucpu** text field box.

After the DEFAULT_RATES table is established, you can add the element records to the Default Rate Table as necessary. In order to add an element to the DEFAULT_RATES table, you must add a rate table for that element. The Adding A Rate Table section on discusses how to add a rate table.

Adding A Rate Table

After you have modified the DEFAULT_RATES table, you can add other rate tables. You must add a rate table for all jobtypes and then you modify the rate table.

You select the **ADD a Rate Table** button from the Rates Table menu window (see Figure 2-26) to display the Add Rate Table data entry window. Figure 2-29 presents the Add Rate Table data entry window.

Figure 2-29 • Add Rate Table Data Entry Window

You enter the rate table name in the **Rate Table Name** text field box and leave the **Job Type** radio button set to All. The different elements associated with these job types for this new rate table contain default values. You now modify the rates for this new table as necessary. The Modifying a Rate Table section on page 2-57 explains how to modify a rate table.

Modifying a Rate Table

You select **Modify a Rate Table** from the Rate Tables menu window (see Figure 2-26) to display the Modify Rate Table data entry window. Figure 2-30 presents the Modify Rate Table data entry window.

Figure 2-30 • Modify Rate Table Data Entry Window

You enter the name of the rate table in the **Rate Table Name** text field box, choose the job type you want to modify from the **Job Type** radio button and specify the element, when applicable. The applicable element text field boxes are active and all others are grayed out. You select the **Apply** or **Done** button and the Modify Rate Table data entry window for the rate table is displayed. Figure 2-31 presents the Modify Rate Table data entry window.

Figure 2-31 • Modify Rate Table Data Entry Window

You modify the rates for each statistic from the Modify Rate Table data entry window. For example, when you want to specify a rate for connect time hours, enter the value in the **connect time** text field box.

Remove A Rate Table

You select **Remove a Rate Table** from the Rates Table menu window (see Figure 2-26) to display the Remove Rate Table data entry window. Figure 2-32 presents the Remove a Rate Table data entry window.
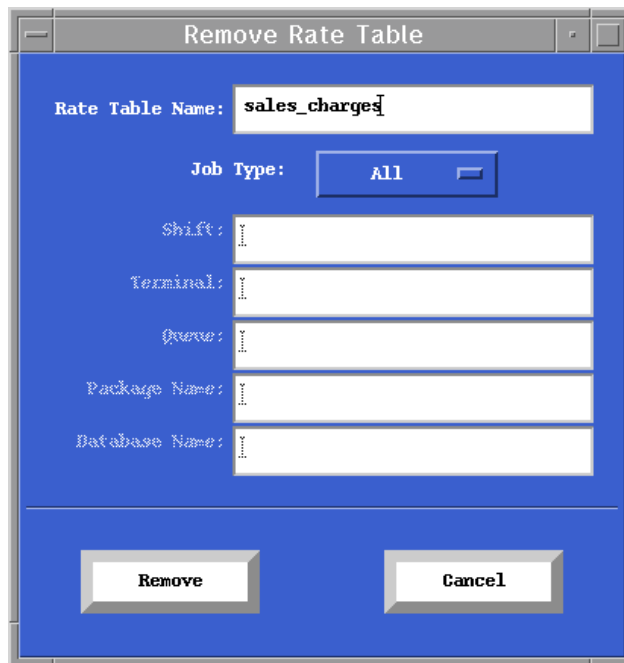
Figure 2-32 • Remove a Rate Table Data Entry Window

You specify the rate table name. You can remove all job types or just specific job types or elements in each job type. You should not remove the DEFAULT_RATES table.

Zeroing A Rate Table

You select the **Zero a Rate Table** button from the Rate Tables menu window (see Figure 2-26) to display the Zero Rate Table data entry window. Figure 2-33 presents the Zero Rate Table data entry window.
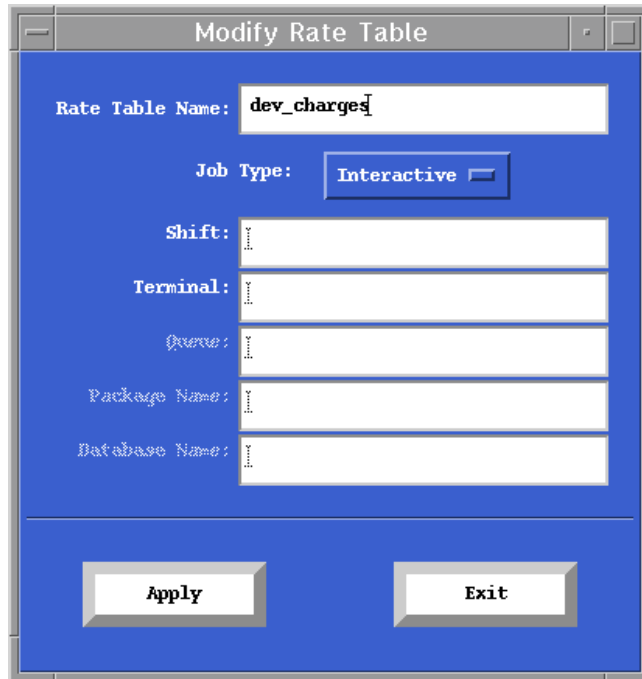

Figure 2-33 • Zero a Rate Table Data Entry Window

You specify the rate table name in the Zero Rate Table data entry window, select the jobtype you want to zero from the **Job Type** radio button and specify any element, when applicable. The applicable element text field boxes are active and all others are grayed out. This feature zeroes the rates for all records matching your specifications.

Assigning A Rate Table

You assign a rate table to a user or project account by adding a node record to a user or project account. From the Modify User or Modify Project data entry windows (see Figure 2-13 or Figure 2-14, respectively), you specify the user or project you want to add, enter the node name in the Node text field box and add the rate table name to the Rate Table text field box. This sequence adds a record for the user and node or the project and node combination.

Shifts Set-Up

Most companies work in shifts. At some companies, it might be 9:00 to 17:00 Monday through Friday. At others, it might be one shift from midnight to 8:00, another from 8:00 to 16:00, and a third from 16:00 to midnight. CIMS for NT/UNIX gives you the ability to report resource utilization by shift and charge different rates for different shifts. The product supports flexible shifts, so you can define your shifts to match your company work hours.

When you first install CIMS for NT/UNIX, these shifts are defined:

■ Prime: Monday through Friday from 8:00 to 17:00

■ Non-prime: Monday through Friday from midnight to 8:00, and from 17:00 to midnight

■ Weekend: all day Saturday and Sunday

■ Holiday: all day on a holiday.

You manage the CIMS for NT/UNIX shift parameters by selecting **Working Shift Schedules** from the CIMS Parameter Administration menu window (see Figure 2-1). The Shift Administration menu window is displayed. Figure 2-34 presents the Shift Administration menu window. When administering the shift parameters, you use the Shift Administration menu window and select the following buttons in accordance with the appropriate action:

Add—Add Shift

Remove—Remove Shift

Report—Generate Shift Report
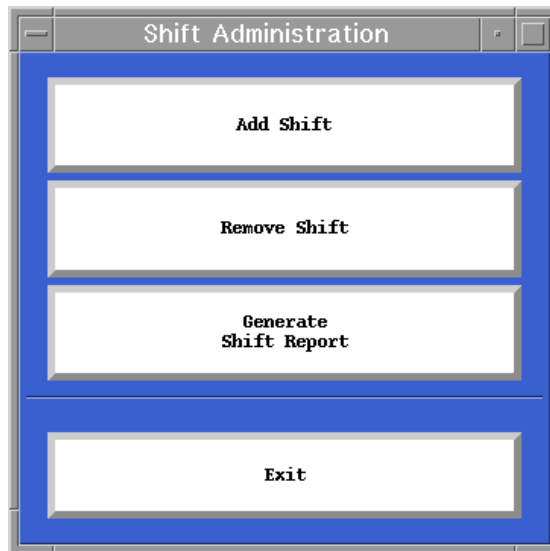
Figure 2-34 • Shifts Administration Menu Window

When you select the **Add Shift** button, the Add Shift data entry window is displayed. Figure 2-35 presents the Add Shift data entry window.

Figure 2-35 • Add Shift Data Entry Window

You must enter a shift name in the **Shift Name** text field and the shift's start time in the **Start Time** text field box. You can provide a description of the shift in the **Description** text field. You define the scope of the shift by toggling the appropriate **day** and **Holiday** toggle buttons.

When you select **Remove Shift**, the Remove Shift data entry window is displayed. Figure 2-36 presents the Remove Shift data entry window.
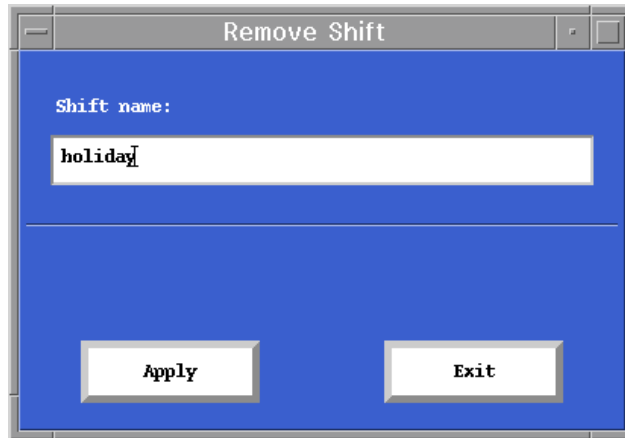
Figure 2-36 • Remove a Shift Data Entry Window

The CIMS for NT/UNIX CLI commands to manage Shift set-up are:

■ ADD/SHIFT—to add new shifts

■ REMOVE/SHIFT—to remove existing shifts

■ REPORT/SHIFT—to report on the existing shifts

Holidays Set-Up

Generally companies have holidays during the year when most employees do not work. You can then report resource usage by holiday or set a special low rate for resources used on those days. Note that you do not have to define holidays unless you plan to use a holiday shift as described in the Shifts Set-Up section on .

When you first install CIMS for NT/UNIX, there are no holidays in the CIMS for NT/UNIX Holiday File.

You manage the CIMS for NT/UNIX holiday parameters by selecting the **Holiday Schedules** button from the CIMS Parameter Administration menu window (see Figure 2-1). The Holiday Administration menu window is displayed. Figure 2-37 presents the Holiday Administration menu window. When administering the holiday parameters, you use the Holiday Administration menu window and select the following buttons in accordance with the appropriate action:

Add—Add a holiday to the schedule

Remove—Remove a holiday from the schedule

Modify—Modify a holiday in the schedule

Report—Generate Holiday Report
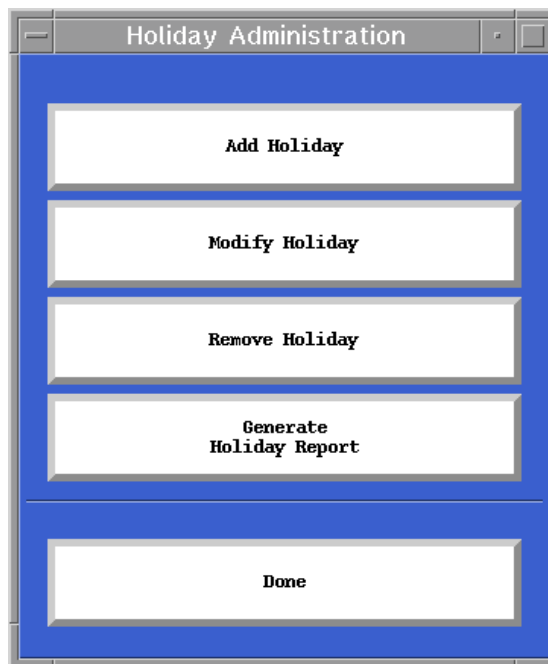
Figure 2-37 • Holiday Administration Menu Window

When you select the **Add Holiday** button, the Add Holiday data entry window is displayed. Figure 2-38 presents the Add Holiday data entry window.
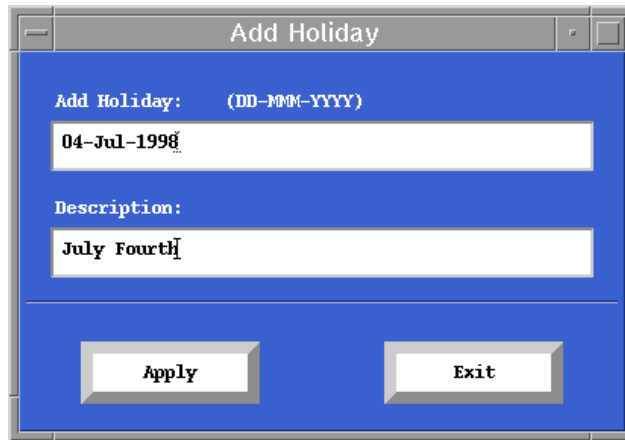
Figure 2-38 • Add Holiday Data Entry Window

You enter the holiday date in DD-MMM-YYYY format in the **Add Holiday** text field box. You can provide a description of the holiday in the **Description** text field box.

When you select modify or remove, an appropriate data entry window is displayed. When you select **Remove Holiday**, the Remove Holiday data entry window is displayed. Figure 2-39 presents the Remove Holiday data entry window. The Modify Holiday data entry window is similar to this window.
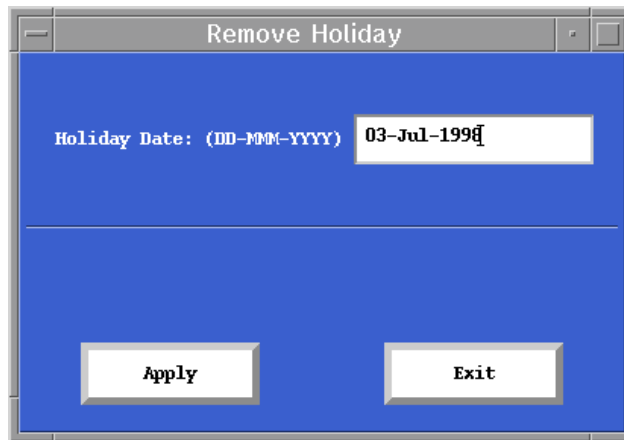
Figure 2-39 • Remove a Holiday Window

Output Queue Set-Up

You must make your batch or print queues known to the CIMS for UNIX in order to report by queue or charge special rates for queues. The CIMS for UNIX Queue Mapping File (A_queuemap.sys) contains the queue mapping definitions. When you first install CIMS for UNIX, there are no queues in A_queuemap.sys. The CIMS for UNIX Select Utility automatically adds new queue names to this file while processing CIMS for UNIX accounting data.

You manage the CIMS for UNIX queue parameters by selecting **Batch and Print Queue Definitions** from the CIMS Parameter Administration menu window (see Figure 2-1). The Queue Administration menu window is displayed. Figure 2-40 presents the Queue Administration menu window. When administering the queue parameters, you use the Queue Administration menu window and select the following buttons in accordance with the appropriate action:

Add—Add a batch or print queue

Remove—Remove a batch or print queue

Report—Generate Batch and Print Report
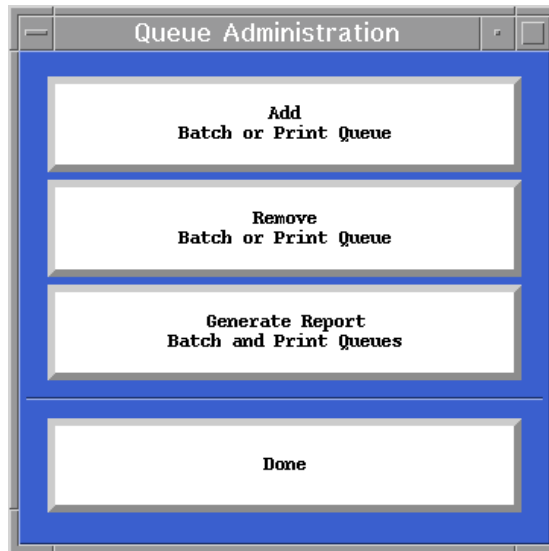
Figure 2-40 • Queue Administration Menu Window

When you select **Add Batch or Print queue**, the Add Queue data entry window is displayed. Figure 2-41 presents the Add Queue data entry window.
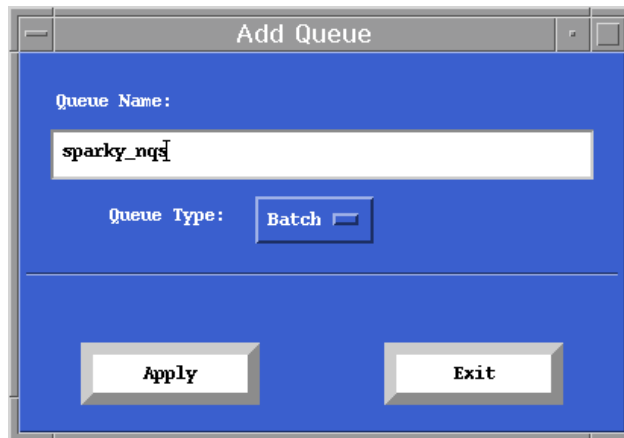
Figure 2-41 • Add Queue Data Entry Window

You enter the queue name in the **Queue Name** text field box and select the appropriate queue type from the **Queue Type** radio button.

When you select **Remove Batch or Print queue**, the Remove Queue data entry window is displayed. Figure 2-42 presents the Remove Queue window.
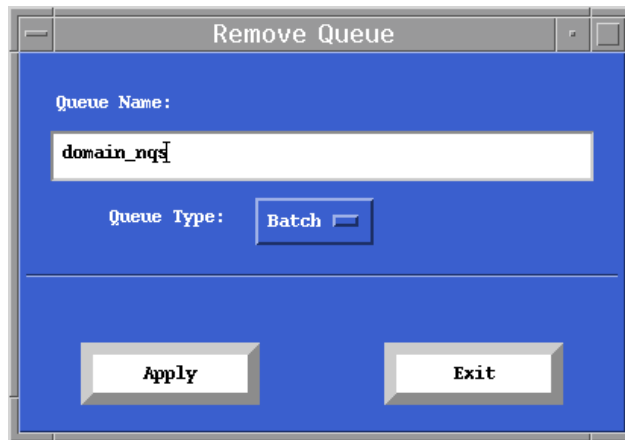
Figure 2-42 • Remove Queue Data Entry Window

GID Method Set-Up

There are two choices for GID Method: group or project. The GID Method value is an CIMS for UNIX system-wide parameter and defaults to group. The GID method implementation is discussed in the *CIMS for NT/UNIX Reference Guide*.

You specify the GID Method value by choosing either choice from the **GID Method** radio button on the CIMS System-Wide Parameters data entry window (see Figure 2-4).

Report Header Set-Up

Most reports produced by the CIMS for NT/UNIX utilities display a user-defined report header. Usually, this report header contains your company name or department.

By default, the header is set to CIMS Lab, Inc. The header can be up to 63 characters.

You specify the header by entering the string into the **Report Header** text field box on the CIMS System-Wide Parameters data entry window (see Figure 2-4).

Digit Separator

The Digit Separator parameter specifies the digit separator to be used by the CIMS for NT/UNIX Report Utility when it prints numbers that are 1000 or larger in magnitude. The digit separator is a single character.

By default, the Digit Separator is set to a comma (","). This is normal for the United States. Some European countries use a period (".") for the digit separator.

You specify the digit separator by entering the single character value into the **Digit Separator** text field box on the CIMS System-Wide Parameters data entry window (see Figure 2-4).

Memory Demand Algorithm Set-Up

Memory utilization in a virtual memory system is usually difficult to measure. However, the various UNIX systems all provide a resource statistic called "average memory usage". However, the magnitude of this number varies from one platform to another. When you have a system from company A and a system from company B, the memory usage figure can vary widely. In this case, you might want to set A's memory demand algorithm different from that of B's, so that the statistics are relatively equal for doing similar work on the two systems

For this reason, CIMS for UNIX lets you normalize the values across your various platforms. When you have all the same kind of UNIX system, you can set the memory demand algorithms to be the same for all your systems.

You can set the memory demand algorithm to a value from 0 to 5. The following table shows what the 6 values mean:

Value	Description
0	The UNIX memory statistic remains unchanged (default).
1	The UNIX memory statistic is divided by 10.
2	The UNIX memory statistic is divided by 100.
3	The UNIX memory statistic is divided by 1,000.
4	The UNIX memory statistic is divided by 10,000.
5	The UNIX memory statistic is divided by 100,000.

You specify the memory demand algorithm by selecting the appropriate value from the **Memory Demand** radio button on the CIMS System-Wide Parameters data entry window (see Figure 2-4).

Monetary Symbols Set-Up

Different countries have different conventions and locations for their monetary symbols. In the United States, the "$" (dollar sign) is the monetary symbol and it appears as a prefix to the amount (that is, it appears on the left). Other countries use different symbols, and it sometimes appears as a suffix to the amount (that is, on the right).

CIMS for NT/UNIX has two user-definable parameters called the Monetary Prefix Symbol and the Monetary Suffix Symbol. Each symbol can be up to three characters long since some countries use multiple character symbols. All CIMS for NT/UNIX utilities use these parameters when displaying monetary amounts. By default, the monetary prefix is set to a dollar sign ("$") and the monetary suffix is set to nothing.

You specify the monetary prefix and monetary suffix by entering the values into the **Monetary Prefix** and **Monetary Suffix** text field boxes, respectively, on the CIMS System-Wide Parameters data entry window (see Figure 2-4).

Radix Point Set-Up

The Radix Point parameter specifies the character CIMS for NT/UNIX uses when displaying numbers that include a fraction (*real* numbers). The radix point is a single character. By default, the Radix Point is set to a period ("."). This is normal for the United States. Some countries use a comma for the radix point.

You specify the radix point by entering the value into the **Radix Point** text field box on the CIMS System-Wide Parameters data entry window (see Figure 2-4).

Storage Accounting Set-Up

CIMS for NT/UNIX Storage Accounting set-up consists of creating and modifying the Storage Parameter File (A_storage.par). A_storage.par is created by the CIMS for UNIX Create Storage Parameter File script (create_A_storage.par) when you install CIMS for UNIX. On NT platforms, A_storage.par is created during the installation and contains an entry for each local drive. You modify A_storage.par using a text editor (for example, vi or Notepad).

A_storage.par is created during the installation of CIMS for UNIX; the UNIX filesystems excluding Network File System (NFS) filesystems and RAID filesystems are the only filesystems included in the initial A_storage.par. A_storage.par needs to be modified to reflect AFS and Migration filesystems.

AFS uses a backup subdirectory for recovery purposes. The backup directory is defined in the AFS configuration file located in /<afs_mount>/<cell>/common/uss/uss.templates. This subdirectory should be specified in A_storage.par to prevent this subdirectory from being sampled and producing duplicate storage information; in the example below, the subdirectory is OldFiles.

A_storage.par contains each filesystem to be sampled. Each filesystem is specified on a separate line. The letter *A* designates AFS and the letter *M* designates Migration filesystems. The following is an example A_storage.par:

```
/
/usr
/var
/mig1 M
/afs A OldFiles
```

A_storage.par is created during CIMS for NT installation. The default contents are c:\. You can edit A_storage.par with any ASCII text editor (for example, Notepad).

CIMS for NT/UNIX Parameter Files Set-Up

CIMS for NT/UNIX accommodates many operational considerations that must be handled to fulfill the CIMS for NT/UNIX phases through scripts. CIMS for NT/UNIX scripts administer some steps of the set-up phase. CIMS for NT/UNIX scripts also assure the data collection phase is accomplished on a scheduled basis and can recover when any problems occur. CIMS for NT/UNIX scripts also automate the data consolidation phase and incorporate client/server aspects. CIMS for NT/UNIX scripts also generate understandable text reports. The CIMS for NT/UNIX scripts utilize parameter files to accomplish their tasks.

CIMS for NT/UNIX Configuration Parameter File

CIMS for NT/UNIX incorporates into these operational scripts a common configuration file that defines parameters that need to be adjusted according to your environment. The CIMS for NT/UNIX Configuration

Parameter File contains the adjustable variables that the scripts read to set up your enterprise environment. CIMS for NT/UNIX creates the initial settings during installation in accordance with your input. However, when your needs change, you modify these parameters through a text editor (for example, vi or NOTEPAD). The CIMS for NT/UNIX Configuration Parameter File is commented and organized coincident to the operational stages. The name of this file for UNIX is `A_config.par` and for NT is `NT_config_par.bat`.

CIMS for NT/UNIX Node Parameter File

The CIMS for NT/UNIX Node Parameter File (`A_node.par`) contains the nodes defined in your client/server environment. CIMS for NT/UNIX creates the initial settings during installation in accordance with your input. However, when your client/server environment changes, you modify the node definitions through a text editor (for example, vi or NOTEPAD). The CIMS for NT/UNIX Node Parameter File has a short and long format. The short form is created during installation and contains one node name per line. The long format lets you specify transfer methods and destination directories.

Print Accounting Set-Up

Print accounting is supported on the following UNIX platforms: AIX, SunOS 4.x, IRIX, OSF/1 and Ultrix. You modify the printer configuration file to enable print accounting. Under AIX, you specify in the printer configuration file (`/etc/qconfig`) a print accounting file using the keyword `acctfile`. Under the other flavors of UNIX, you specify in the printer configuration file (`/etc/printcap`) a print accounting file using the keyword `af`.

CIMS for UNIX maps the print queue to the accounting file specified for that print queue using the CIMS for UNIX Print Parameter File (`A_print.par`). `A_print.par` contains one printer and accounting file per line. There can only be one queue name associated with a particular print accounting file. If all your print queues utilize the same accounting file, you should only have one entry in `A_print.par`. The format follows:

For example, the /etc/printcap file has the following print queue definition:

```
lp0|0|lta5|LTA5 queue on node1:\
:af=/usr/adm/lta5-acct:\
:if=/usr/lib/lpdfilters/lpf:\
:lp=/dev/tty17:\
:fc#0177777:\
:fs#023:\
:op=PORT_8:\
:ts=FRED:\
:pl#60:\
:sd=/usr/spool/lta5:
```

":af" defines the UNIX print accounting file associated with lp0.

The entry in A_print.par would be:

```
lp0 /usr/adm/lta5-acct
```

3

CIMS for NT/UNIX Data Collection

Data Collection Overview

The data collection phase encompasses accumulating the raw system and CIMS for NT/UNIX accounting files and formatting this data into the CIMS for NT/UNIX accounting and storage files. The CIMS for NT/UNIX Nightly script handles all the steps of the data collection phase on a daily basis. This script is a scheduled job (for example, UNIX Clock Daemon (cron) entry). This daily processing keeps the accounting and storage data uniform and in synch for more precise and controllable resource management and chargeback. The CIMS for NT/UNIX accounting and storage file names contain the day's date in YYYYMMDD format.

CIMS for NT/UNIX Nightly Script

The CIMS for NT/UNIX Nightly scripts call the following CIMS for NT/ UNIX scripts:

> CIMS for NT/UNIX Turnacct
>
> CIMS for NT/UNIX Sampler
>
> CIMS for UNIX Prtacct
>
> CIMS for NT/UNIX Runacct
>
> CIMS for NT/UNIX Send

These scripts utilize the CIMS for NT/UNIX Configuration Parameter file to perform the data collection phase in accordance with your needs. This parameter file contains environment variable settings that affect the operations performed by these scripts.

The names of these scripts differ between UNIX and NT, but they perform the same functions. The CIMS for NT/UNIX Nightly script for UNIX is called `arsap_nightly` and for NT is called `NT_arsap_nightly.bat`.

Data Accumulation

The accumulation step involves gathering the various forms of accounting data. The accounting data originates from the operating system (that is, UNIX and NT), batch systems (that is, CXbatch and NQS), and CIMS for NT/UNIX. The CIMS for NT/UNIX `turnacct` script and the CIMS for NT/UNIX `sampler` script handles the data accumulation step.

CIMS for NT/UNIX Turnacct Script

The CIMS for NT/UNIX `turnacct` script turns over the raw system and CIMS for NT/UNIX accounting files by moving them into the `ARSAP_HISTORY` directory. This script appends the day's date in YYYYMMDD format to the names of these files. The command line parameter `turn` is used for this action. These accounting files are:

- UNIX `wtmp`, `wtmpx` and `pacct` Files

- NT security and application event logs

- CIMS for UNIX Activity File

- Convex Batch (`CXbatch`) Accounting File (optional)

- NQS Batch Accounting File (optional)

- CIMS for UNIX Oracle Accounting File (optional)

- CIMS for UNIX IBM DB2 Accounting File (optional)

Note • **The NT event logs are turned over by a call to the CIMS for NT Format Utility (`NT_format`) that accepts a TURN command.**

The CIMS for NT/UNIX `turnacct` script reinitializes these files for the next day's activity. This script handles the optional files according to their associated settings in the CIMS for NT/UNIX Configuration Parameter File:

- When `PROC_CXbatch` is set to **Y** and `BACCT_FILE` is designated, the `CXbatch` Accounting File is processed.

- When `PROC_NQSbatch` is set to **Y** and `NQS_BACCT_FILE` is designated, the NQS Batch Accounting File is processed.

- When `A_ORACLE_ACCT` is set to **Y**, CIMS Oracle Accounting File is processed.

- When `A_DB2_ACCT` is set to **Y**, CIMS DB2 Accounting File is processed.

The CIMS for UNIX `turnacct` provides the options to turn UNIX accounting on or off. The command line parameters are **on** and **off**, respectively.

CIMS for NT/UNIX Sampler Script

The CIMS for NT/UNIX Sampler script (`sampler`) invokes the CIMS for NT/UNIX Sampler Utility (`A_sampler`). `A_sampler` traverses filesystems that include specific directory trees in accordance with the CIMS for NT/UNIX Storage Parameter File (`A_storage.par`). These filesystems are: locally mounted UNIX, RAID, AFS, and Migration filesystems. `A_sampler` writes the sampled disk space utilization information to the CIMS for NT/UNIX Storage File (`A_storage.sys`). `A_sampler` accumulates the amount of file space allocated by UID and GID.

`sampler` moves `A_storage.sys` to the `ARSAP_HISTORY` directory with the name, `str_<date>.dat` where date is in YYYYMMDD format.

`Sampler` is executed only when `ARSAP_SAMPLE` is set to **Y** in the CIMS for NT/UNIX Configuration Parameter File.

Data Formatting

The formatting step formats the accumulated accounting files into the CIMS for NT/UNIX accounting file. Each raw accounting file is formatted into specific accounting records. The record reflects a specific jobtype. Since these files contain raw data (that is, binary format), they must be formatted on the machine on which the data was accumulated. The CIMS for NT/UNIX Format Utility formats the accumulated data with intermediate CIMS for NT/UNIX accounting files that are located in the ARSAP_DATA directory. These accounting files are sorted chronologically into the CIMS for NT/UNIX accounting file. The CIMS for NT/UNIX accounting file can be transferred to a specified common repository. The CIMS for UNIX Print Accounting script (prtacct), the CIMS for NT/UNIX Runacct script and the CIMS for NT/UNIX Send script handle the data formatting step.

In addition, the CIMS for NT/UNIX Redo Nightly script formats the CIMS for NT/UNIX historical data. This script calls the CIMS for UNIX Redo Print script. This process might need to be performed because of a formatting problem where the CIMS for NT/UNIX accounting file was not produced.

CIMS for NT/UNIX Send Script

The CIMS for NT/UNIX Send script lets you transfer the CIMS for NT/ UNIX accounting file from the `ARSAP_HISTORY` directory to a designated `ARSAP_SERVER` node. This script incorporates the needs of the client/server environment. When the CIMS for NT/UNIX accounting data is being collected on multiple nodes, you can transfer this data into a common repository on the `ARSAP_SERVER`. This common repository lets you accomplish the data consolidation and data reporting phases more easily.

The CIMS for NT/UNIX Send script provides the means to transfer via ftp, rcp, COVUE or DECnet. The settings are specified in the CIMS for NT/ UNIX Configuration Parameter File. The variables utilized are `ARSAP_SEVER`, `TRANSFER_VIA` and `ARSAP_DEST`.

For a non-interactive ftp, the `.netrc` file must exist. This can be an existing `.netrc` file or the CIMS for NT/UNIX Send can create the `.netrc` file on the fly, removing the file upon completion.

When you do not want to perform this transfer from each `ARSAP_CLIENT` node on a nightly basis, CIMS for NT/UNIX furnishes another operational script, the CIMS for NT/UNIX Get Accounting File script that is performed on the `ARSAP_SERVER` node prior to processing the accounting data. This script is described in the *CIMS for NT/UNIX Reference Guide*.

CIMS for NT/UNIX Redo Nightly Script

The CIMS for NT/UNIX Redo Nightly script formats the historical raw accounting data; this recovery script processes the accumulated accounting files should an error occur causing the CIMS for NT/UNIX Nightly script to fail. You use this script to create CIMS for NT/UNIX accounting file(s) from the raw accounting files in the `ARSAP_HISTORY` directory. In order to use this script, the raw accounting files must exist in the `ARSAP_HISTORY` directory.

The CIMS for NT/UNIX Redo Nightly script accepts one command line argument that can be a date in YYYYMMDD format or **all**. The date specifies that one day's accounting files are processed. The **all** argument indicates that all historical accounting files are processed. When no argument is supplied, the current date specified by **today** is the default; therefore, the accounting files for the current day are processed.

The CIMS for NT/UNIX Redo Nightly script invokes the CIMS for NT/UNIX Runacct and Send scripts. These formatting scripts operate in the same manner as previously discussed. Therefore, when CIMS for NT/UNIX accounting files exist, they are overwritten. When you want to save any existing CIMS for NT/UNIX accounting files, you must move them out of the current CIMS for NT/UNIX accounting file repository (for example, the accounting subdirectory (ARSAP_DEST) on the ARSAP_SERVER).

CIMS for UNIX Redo Print Script

The CIMS for UNIX Redo Print script (redo_print) formats the historical print accounting data. This script performs the same function as the CIMS for UNIX Print Accounting script (prtacct) but processes the print accounting data that has been turned over to the ARSAP_HISTORY directory.

4

CIMS for NT/UNIX Data Consolidation

Data Consolidation Overview

The data consolidation phase processes the CIMS for NT/UNIX accounting file(s) produced on each `ARSAP_CLIENT` into a centralized statistics file. The data collection phase centers on each node because data must be collected on each node. The data consolidation phase lets you process data on each node or group of nodes. Once the data is consolidated into the statistics files, you can generate reports.

The frequency of data consolidation and reporting depends on the needs of your site. You can set up periodic reporting (for example, daily, weekly, monthly). You can also process and generate a large variety of interim reports at any time.

The type of statistics file determines the type of report you can generate. Since the statistics file is the product of the data consolidation phase, you must choose the correct processing options. This determines the type of reports you can generate. When you want to produce resource management reports, you must generate the CIMS for NT/UNIX Merged Statistics File. When you want to produce session audit reports, you must generate a CIMS for NT/UNIX Audit Statistics File. When you want to produce capacity reports, you must generate a CIMS for NT/UNIX Capacity Statistics File.

You also must determine the reporting period that suits your needs. You define the data reporting period by determining the beginning (**SINCE**) and ending (**BEFORE**) date you want to report on (for example, from 01-Jun-1997 until 01-Jul-1997). You also determine the data window that is the range of accounting files that you look at to generate a statistics file for the reporting period. Therefore, the data window is the reporting period, plus a number of days back (**RANGE_BACK**) and ahead (**RANGE_AHEAD**).

When you consolidate the data with project accounting enabled, there are times when a project login record cannot be associated with a session. You have several options for assigning a project to this session. These options range from using the last project found for the user associated with this session to using the group name associated with the process as the project. Refer to the *CIMS for NT/UNIX Reference Guide*, for more information on these and other options.

Data consolidation has been automated so that processing for several nodes is easy. This automated process can be run to process a single node as well. You can run each of the steps interactively using the CIMS for NT/UNIX CLI. The steps in the data consolidation procedure include copying or linking the accounting files for a node into the ARSAP_DATA directory, running the CIMS for NT/UNIX Select Utility and then the CIMS for NT/UNIX Merge Utility, and removing the accounting files from the ARSAP_DATA directory. This step is repeated for each node for which you want to generate a report.

A site with a very large number of machines can consolidate the data simultaneously on several machines, with a final consolidation on the ARSAP_SERVER using the CIMS for NT and UNIX Super Merge Utility. This approach drastically reduces the amount of time necessary to consolidate large amounts of data.

Sites with any mix of UNIX, NT, and OpenVMS platforms might want to consolidate all data on a centralized platform for enterprise-wide reporting.

Processing Multiple Nodes

The CIMS for NT/UNIX Process Multiple Node(s) script automates the data consolidation phase for multiple nodes. This script is located in the ARSAP_ETC directory. You can invoke this script through the CIMS for UNIX GUI or from the shell command line. You must enable the system-wide clump support to process multiple nodes. This option lets you attach the node name to the data you are processing for resource or audit reports. In addition, the CIMS for NT/UNIX Node Parameter File (A_node.par) must contain the node name of all nodes you want to process.

When **Clump Support** is enabled, you are presented with a list of all nodes contained in the CIMS for NT/UNIX Node Parameter File (A_node.par). You can highlight any combination of these nodes to be processed or toggle the **Select All** toggle button to process all possible nodes.

You toggle the **Execute in Background** toggle button to enable or disable background execution. You should enable this option. Otherwise, nothing else can be done until the processing is done.

You toggle the **Continue on Node Error** toggle button to let the consolidation continue even when processing on a single node has failed.

You select the types of reports that you want to generate by toggling the appropriate report toggle buttons. You automatically process for resource reports. You can add capacity reporting and auditing.

The accounting date range defines the period for which you are consolidating data. For example, to process for the month of February 1999, the **Since Date** should read 1-Feb-1999, and the **Before Date** should read 1-Mar-1999. This data reporting period processes data through the end of February.

The **Range Ahead** and **Range Back** text field boxes define the data window specification. These numbers must be positive. The Data Window section explains the data window concepts.

You have the option to create a new statistics file, add to an existing statistics file, or zero out statistics for the nodes you have selected.

To use additional select qualifiers such as /UNKNOWN_PROJECT=LAST_PROJECT, you must add the qualifiers to the SELECT_QUALS environment variable in the CIMS for NT/UNIX Configuration Parameter file. The CIMS for NT/UNIX Select Utility section describes these select qualifiers.

You should send standard out and standard error to a log file. The syntax for creating a log file when running this script from sh or ksh is as follows:

```
# proc_multi 1-jan-1999 1-feb-1999 new range continue 1> $ARSAP_HOME/log/proc.log
2>&1
```

The syntax for creating a log file in csh is as follows:

```
# proc_multi 1-jan-1999 1-feb-1999 new range continue >& $ARSAP_HOME/log/proc.log
```

5

CIMS for NT/UNIX Data Reporting

Data Reporting Overview

The data reporting phase involves making decisions on what types of reports and on which data you want to generate reports. Report generation depends on decisions made during the data consolidation phase (see *Data Consolidation Overview* on page 4-2). When you produce a CIMS for NT/UNIX Merged Statistics File (A_stat.dat), you can generate resource reports. When you produce a CIMS for NT/UNIX Audit Statistics File (A_audit.dat), you can generate audit reports. When you produce a CIMS for NT/UNIX Capacity Statistics File (A_cap.sys), you can generate capacity reports. In addition, various system-wide reporting parameters might need to be defined (refer *Reporting Parameters Set-Up* on page 2-44).

You can produce textual and graphical reports. The CIMS for NT/UNIX Report Utility produces textual reports. This utility utilizes a Report Description File (RDF) that defines the data you want to report on and the format of the report. The CIMS for UNIX Graphic Utility produces graphical reports. This utility utilizes a Graphical Description File (gdf) that describes the type of graphical report and composition of the report you want to generate

When you decide to report under CIMS for OpenVMS, you can generate UNIX reports using the CIMS for OpenVMS Reporting Utilities. Only textual reports can be generated under CIMS for OpenVMS.

Resource Reports

Resource reports display system usage statistics for a specified time period contained in A_stat.dat. System usage attributed to users, projects, terminals, software packages, print and batch queues, and more can be output in a format described by the user in a Resource Description File (rdf).

The user-defined data selection determines the available resource reports. The following list is a small subset of the resource reports that can be generated:

- Users and the projects, broken down by shifts

- All users that accessed a certain project

- All projects accessed by a certain user

- All users that used a certain software package

- Project report showing resource usage

- User report showing resource usage

- Project report showing charges incurred for usage

- User report showing charges incurred for usage

- All activity for a certain user, broken down by shifts, terminal, and software package

- Disk usage for all projects

- Multi-tiered report showing all projects grouped by department, grouped by section, grouped by site

- Disk usage report broken down by uid

- Disk usage report broken down by gid

- Print report showing print usage on all your systems, broken down by project

- Batch report showing batch queue usage on a Convex machine

- Activity broken down by shift

- Software package report

- Charges report for all users in all cost centers

■ Charges report for all users in a particular cost center

Session Audit Reports

Session audit reports display statistics for session-by-session system usage contained in `A_audit.dat`. There are several different jobtypes for audit sessions. An interactive session begins at login time and ends when you log out. A background session exists for each background job or each group of background jobs running the same image. A batch session exists for each batch job. A print session exists for each print job. The session-by-session system usage attributed to these jobtypes can be output in a format described by you in an Audit Description File (`adf`).

The data selection you define determines the audit reports that can be generated. The following list is a small subset of the audit reports that can be generated:

■ Session-by-session display of users and projects, broken down by shifts

■ Session-by-session display of users that accessed a certain project

■ Session-by-session display of projects accessed by a certain user

■ Session-by-session display of users that used a certain software package

■ Session-by-session display of projects showing charges incurred for usage

■ Session-by-session display of users showing charges incurred for usage

■ Session-by-session display of a certain user, broken down by shifts, terminal, and software package

■ Session by session display of print jobs on all your systems, broken down by project

■ Session-by-session display of batch queue usage on a Convex machine

Capacity Reports

Capacity reports display statistics for resource utilization by node contained in A_cap.sys. Resource utilization attributed to one or more nodes can be output in a format described by the user in a Capacity Description File (cdf). A capacity report is a historic trend report of resource utilization on each node.

The data selection defined by the user determines the capacity reports that can be generated. The following list is a small subset of the capacity reports that can be generated:

■ Capacity reporting display of all nodes broken down by hours

■ Capacity reporting for one node broken down by days

■ Capacity reporting for certain nodes broken down by weekdays

■ Capacity reporting for all nodes broken down by month

Generating Textual Reports

Generating textual reports consists of two distinct steps: creating RDFs and running the CIMS for NT/UNIX Report Utility. You generate textual reports through the CIMS for UNIX GUI or through the CIMS for NT/UNIX CLI.

Generating Textual Reports with CIMS for UNIX GUI

The CIMS for UNIX GUI provides two buttons on the Welcome to CIMS main menu screen (refer to Figure 1-1) to generate textual reports. The two buttons are: **Design Text Reports** and **Generate Text Reports**. The **Design Text Reports** button provides control windows to create customized RDFs. The **Generate Text Reports** button provides the list selection box to generate text reports from your RDFs.

Generating Textual Reports with CIMS for UNIX GUI

You generate a textual report from a pre-defined RDF through the **Generate a Report** file selection box. You display this window by selecting the **Generate Text Reports** button. Figure 5-1 presents the **Generate Text Report** file selection box.
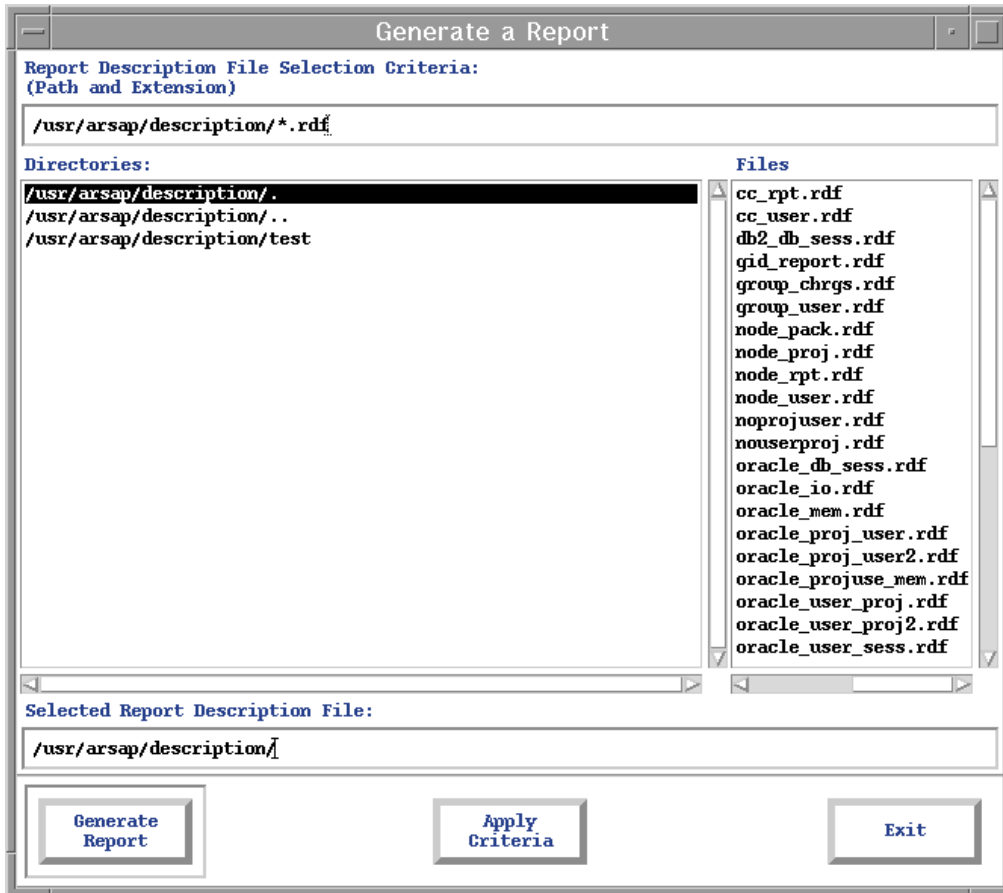

Figure 5-1 • Generate a Report File Selection Box

You select the appropriate RDF from this window. The selection is displayed in the **Selected Report Description File** text field. You then select the **Generate Report** button that displays the SelectReport_Dialog window. You select the generate button that corresponds to your report type:

■ Resource report—Generate Resource Report

■ Audit report—Generate Audit Report

■ Capacity report—Generate Capacity Report

When CIMS for UNIX reporting data is found, CIMS for UNIX displays the generated report in the CIMS System Log display (refer to Figure 2-5).
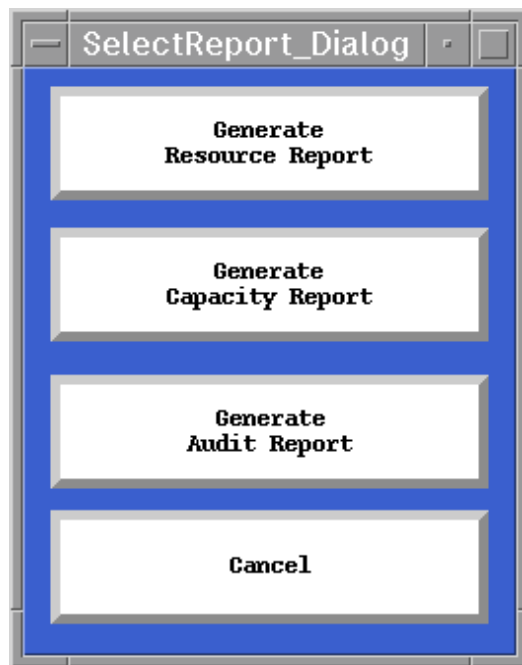

Figure 5-2 • Select Report Dialog Menu Window

Creating Report Description Files with CIMS for UNIX GUI

You create and modify RDFs through two CIMS for UNIX GUI control windows. The layout of these windows relates to the structure of the RDF.

The Design Report—Select Records control window is displayed by selecting the **Design Text Reports** button. This window presents the select and sort sections of the RDF. The Design Report—Design Layout control window is displayed by selecting the **Next Screen** button from the Design Report—Select Records control window.

The Design Report—Select Records control window consists of three divisions. The top part presents a list box of pre-defined RDFs. The middle of the window contains the controls to specify the RDF select

section. The bottom part contains the controls to define the RDF sort section. Figure 5-3 presents the Design Report—Select Records control window.
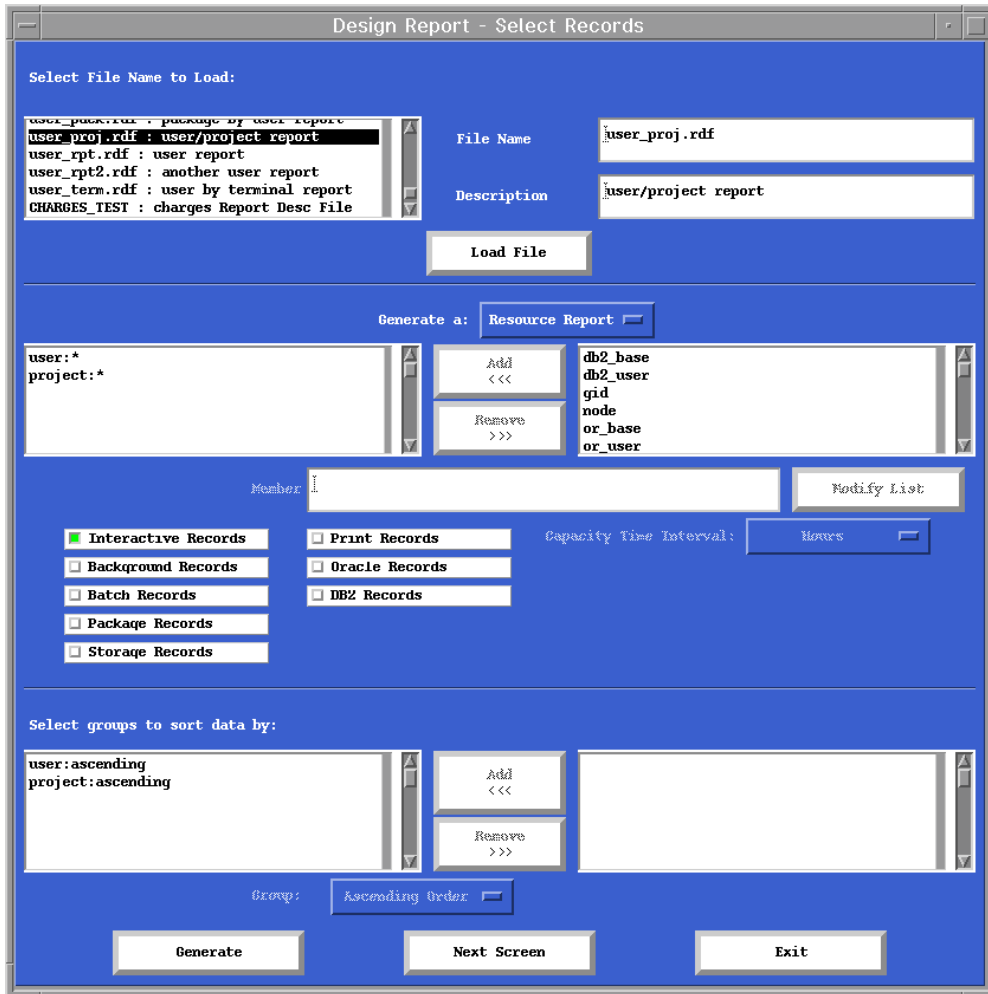

Figure 5-3 • Design Report–Select Records Control Window

The CIMS for UNIX GUI populates the pre-defined RDFs list box with file names and associated descriptions from the CIMS for UNIX Description Directory File (`A_descr.dir`). This file is located in the `ARSAP_HOME/` description directory. You can load a pre-defined RDF by highlighting the appropriate file name and either double clicking or selecting the **Load File** button.

Select section consists of two list boxes: the **select keyword** list box on the right and the **select section** list box on the left. The CIMS for UNIX GUI populates the **select keyword** list box according to the setting of the **Report Type** radio button. You populate the **select section** list box by highlighting a select keyword and either double-clicking or selecting the left arrow button. When you want to remove an entry from the **select section** list box, highlight the entry and either double-click or select the right arrow button.

The Design Report—Design Layout control window is divided into two parts. The top of the window shows the RDF select and sort sections. These boxes are just for display. The second part contains the controls to establish the RDF body section. Figure 5-4 presents the Design Report—Design Layout control window.

Figure 5-4 • Design Report–Design Layout Control Window

Generating Textual Reports with CIMS for NT/UNIX CLI

The CIMS for NT/UNIX CLI interfaces directly with the CIMS for NT/ UNIX Report Utility. The CIMS for NT/UNIX CLI does not provide a utility to create RDFs. You must create RDFs through a text editor (for example, vi).

The CIMS for NT/UNIX Report Utility uses a command that determines the type of report and two optional qualifiers: /DESC_FILE and /OUTPUT. The commands are REPORT, AUDIT, and CAPACITY that produce resource, audit and capacity reports, respectively.

The /DESC_FILE qualifier specifies the description file used to generate the report. When a path name is needed, you must enclose it in quotes ("). When you do not use this qualifier, the default resource description file, A_rpt_desc.sys, the default audit description file, A_audit_desc.sys, or the default capacity description file, A_cap_desc.sys that must be located in the ARSAP_DATA directory, is used.

The /OUTPUT qualifier designates an output file to which the report is written. When you do not use this qualifier, the report is displayed to standard out. When a path name is needed, you must enclose it in quotes (").

You generate a textual report through the CIMS for NT/UNIX CLI by performing a command similar to the one that follows:

```
# A_report
A_REPORT> REPORT/DESC_FILE=node_user.rdf/OUTPUT=node_user.out
%RPT-I-LISTMSG1, writing listing file
%RPT-I-LISTMSG2, listing file node_user.out is complete
A_REPORT> EXIT
#
```

The CIMS for NT/UNIX Report Utility produces a flat ASCII file. This format lets you post process this output according to your needs. Post processing can involve importing this file into a spreadsheet or accounting package, formatting the report using an awk script, or transfer this file to an MVS platform to incorporate this data into your mainframe accounting package.

CIMS for NT/UNIX provides numerous reporting scripts that invoke awk to generate reports with a report header, column headers, subtotals and totals. These scripts are located in the `ARSAP_HOME/scripts/reports` directory. This directory is organized by report categories.

Graphic Reports

You generate graphic reports through the CIMS for UNIX Graph Utility. The CIMS for UNIX Graph Utility generates a temporary RDF and then invokes the CIMS for UNIX Utility that produces a flat, #-delimited output file. The CIMS for UNIX Graph Utility then graphs the resulting data.

The CIMS for UNIX GUI provides two buttons on the Welcome to CIMS for UNIX main menu screen (refer to Figure 1-1) to generate graphical reports. The two buttons are: **Generate Graphic Reports** and **Design Graphic Reports**. The **Generate Graphic Reports** button provides the list selection box to generate graphical reports from your Graphic Description File (GDF). The **Design Graphic Reports** button invokes the CIMS for UNIX Graph Utility.

You can invoke the CIMS for UNIX Graph utility from the UNIX command line. You can supply a GDF when invoking the CIMS for UNIX Graph utility from the command line.

Generating Graphic Reports with CIMS for UNIX GUI

You generate a graphic report from a pre-defined GDF through the Generate a Graph file selection window.

The Generate a Graph file selection window is displayed by selecting the **Generate Graphic Reports** button. Figure 5-5 presents the Generate a Graph Report file selection box. You select the appropriate GDF from this window. The selection is displayed in the **Selected Graph Selection File** text field. You then select the **Generate Graph** button that displays the CIMS Graph window (refer to Figure 5-6) with the options and parameters set according to the GDF. When CIMS for UNIX reporting data is found, CIMS for UNIX Graph generates the graph from the GDF.
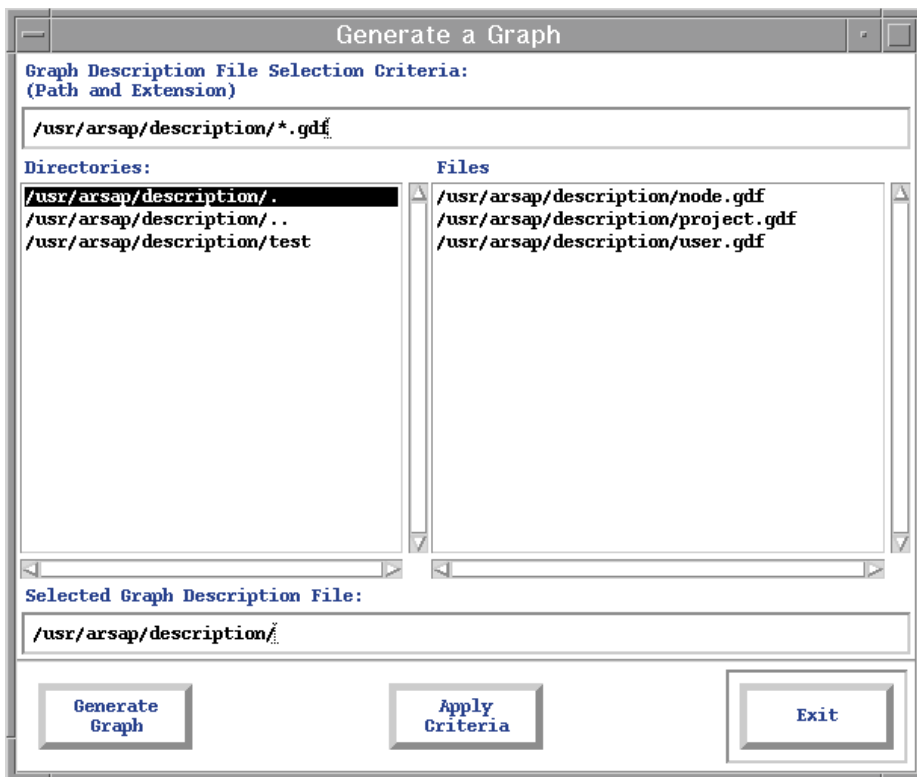
```
┌──────────────────── Generate a Graph ────────────────────┐
│                                                            │
│ Graph Description File Selection Criteria:                 │
│ (Path and Extension)                                       │
│ ┌────────────────────────────────────────────────────────┐│
│ │/usr/arsap/description/*.gdf                             ││
│ └────────────────────────────────────────────────────────┘│
│ Directories:                      Files                    │
│ ┌──────────────────────────┐  ┌──────────────────────────┐ │
│ │/usr/arsap/description/.   │  │/usr/arsap/description/node.gdf │
│ │/usr/arsap/description/..  │  │/usr/arsap/description/project.gdf │
│ │/usr/arsap/description/test│  │/usr/arsap/description/user.gdf │
│ │                          │  │                          │ │
│ └──────────────────────────┘  └──────────────────────────┘ │
│                                                            │
│ Selected Graph Description File:                           │
│ ┌────────────────────────────────────────────────────────┐│
│ │/usr/arsap/description/                                  ││
│ └────────────────────────────────────────────────────────┘│
│   ┌──────────┐      ┌──────────┐      ┌──────────┐         │
│   │ Generate │      │  Apply   │      │   Exit   │         │
│   │  Graph   │      │ Criteria │      │          │         │
│   └──────────┘      └──────────┘      └──────────┘         │
└────────────────────────────────────────────────────────────┘
```

Figure 5-5 • Generate a Graph Report File Selection Window

CIMS for UNIX Graph Utility

The **Design Graphic Reports** button invokes the CIMS for UNIX Graph Utility. The CIMS Graph window consists of a file pull-down menu and numerous widgets: buttons, selection list boxes and text field boxes.

These widgets are organized functionally into the Data Parameters and the Chart Parameters classes. Figure 5-6 presents the CIMS Graph window.
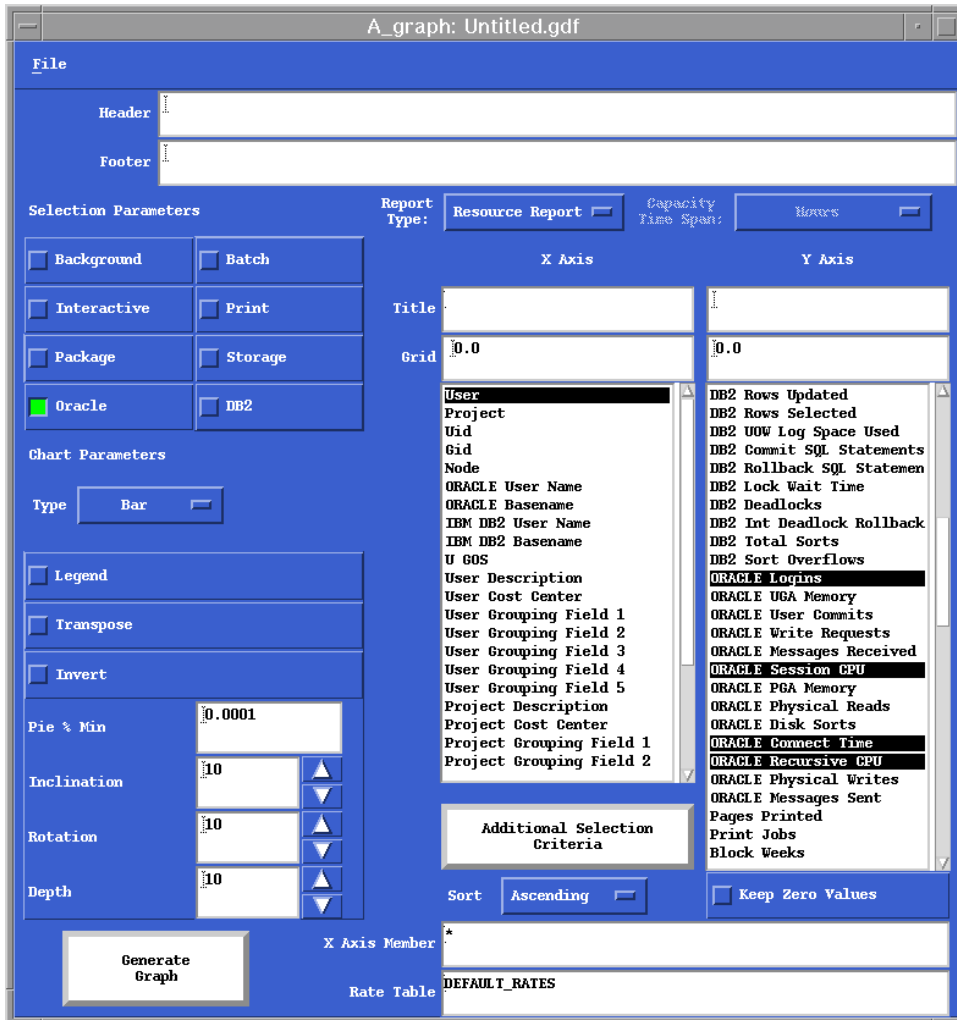

Figure 5-6 • CIMS Graph Utility Window

The File menu contains eight items: **Info**, **New**, **Open**, **Save**, **Save As**, **Graph**, **Environment** and **Exit**.

The **Info** menu item is a pop-up menu that contains two items: **Identify** and **Tech Support**. You select the **Identify** item to display the product version information window. The **Tech Support** item displays a technical support information window.

The **New** item clears the current settings on the window and sets the default values.

The **Open**, **Save** and **Save As** items behave the same. When you select one of these items, the Generate a Graph Report file selection window is displayed (refer to Figure 5-5).

The **Graph** item behaves like the **Generate Graph** button (refer to *Generate Graph Button* on page 5-25).

When you want to view and modify the current CIMS for UNIX environment variables that CIMS for UNIX Graph uses, you select the **Environment** item. The A_graph Environment data entry window is displayed. Figure 5-7 presents the A_graph Environment data entry window. Each environment variable has a text field box with its current setting. You modify an environment variable by changing the current

setting for the appropriate variable and selecting the **Modify** or **Cancel** button. When you are just viewing the variables, you select the **Cancel** button.
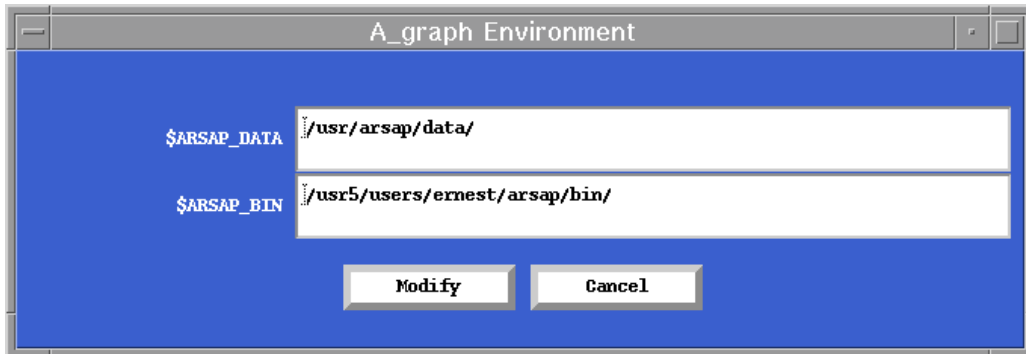
Figure 5-7 • A_graph Environment Data Entry Window

The Exit item ends the current CIMS for UNIX Graph session.

Data Parameters

The data parameters define the RDF that establishes what data is in the report. The data parameters are: report type, jobtype(s), selection criteria, sort criterion, statistics and rate table for charge statistics. These parameters are read only when the graph is generated. When you change a data parameter, you must regenerate the graph for this change to take affect.

Selection Parameters

The **Selection Parameters** toggle buttons specify the jobtypes that should be included in the graph. You can report on background, batch, interactive, package, print, Oracle, DB2 or storage records or any combination of these jobtypes. By default, only interactive and background are enabled.

Report Type

The **Report Type** radio button determines the type of report to generate. The report types are: resource (default) and capacity. When you select capacity, the **Capacity Time Span** radio button becomes active. You then select the capacity category. The default capacity category is **Hours**.

X Axis (Selection Criteria)

The selection list box, the **X Axis Member** text field box and the **Additional Selection Criteria** button located under the X Axis label represent the graphic report selection criteria. The selection criteria specify the records that are included in the report.

Selection Keywords

The selection keywords selection list box is located below the X Axis label. This selection list box contains the selection keywords in accordance with the selected report type. The selection keywords are discussed in the Select Section section. You can select only one item from this list. By default, no item is highlighted.

X Axis Member

The X Axis Member text field box restricts selected records to those that match the specified patterns. The select member list syntax is discussed in the Select Section section. The default member list is to display all records (that is, "*").

Additional Selection Criteria

You can further refine your report by providing additional selection criteria. You select the **Additional Selection Criteria** button that displays the Restrict X Axis To: window. This window displays the label `Select <keyword>(s) where: Is Equal To:` where *<keyword>* indicates the primary selection criteria whose text field also is grayed out in the text field list. A text field box is presented for the additional select keywords. You choose additional criteria by entering a value in the appropriate text field boxes. Figure 5-8 presents the Restrict X Axis To: window.
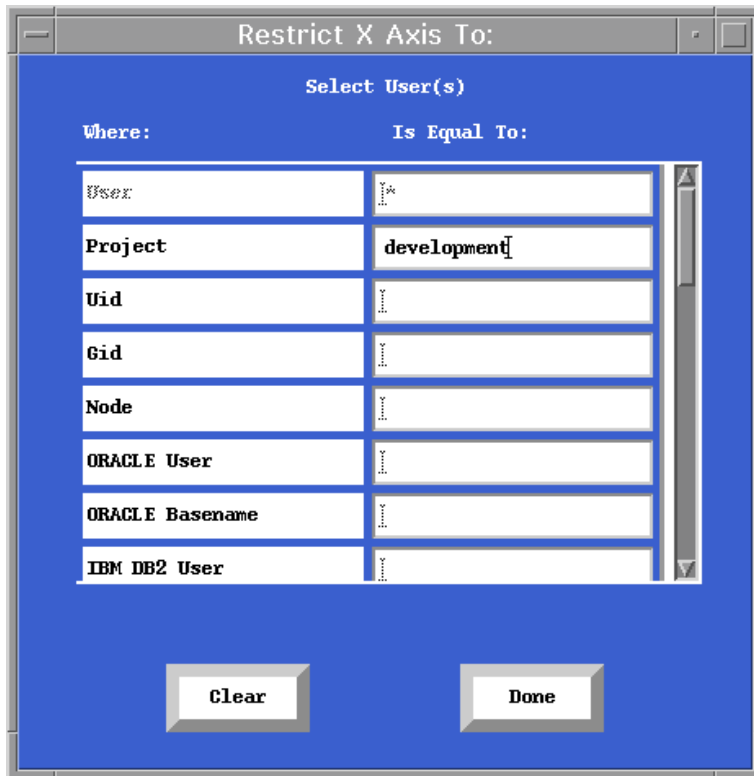
Figure 5-8 • Restrict X Axis To: Data Entry Window

Sort

The **Sort** radio button specifies how the selected records are sorted for display. Records can be sorted into either ascending or descending order. The default is ascending order.

Y Axis (Statistics)

The statistics keywords selection list box is located below the Y Axis label. This selection list box contains the valid statistics keywords. The statistics keywords are discussed in the *CIMS for NT/UNIX Reference Guide*. You must select at least one item from this list. By default, no item is highlighted.

Rate Table

The **Rate Table** text field box specifies the rate table to be applied to the charge statistics. The valid values are:

Value	Description
user	Apply the user record rates as defined in the CIMS for NT/UNIX Authorization File.
project	Apply the project record rates as defined in the CIMS for NT/UNIX Authorization File.
DEFAULT_RATES	Apply the DEFAULT rate record.
<ratetable>	Apply the specified <ratetable> to all records. When the <ratetable> does not exist in the CIMS for NT/UNIX Rates File, the DEFAULT_RATES table is used.

The default value is DEFAULT_RATES.

Keep Zero Values

The **Keep Zero Values** toggle button specifies whether records whose statistics are all zero should be included in the chart. The default is to exclude records with zero statistics (that is, disabled).

Chart Parameters

The display of a graphic report can be customized. The chart parameters let you adjust the presentation of your graphic reports. Changes to these parameters take effect immediately.

Header

The Header text field box specifies text to be displayed above the date range on the chart. The default header is blank.

Footer

The Footer text field box specifies text to be displayed below the chart. The default footer is blank.

Title

The title fields specify the axis labels on the graph. The Title text field box beneath the X Axis label specifies the label for the X axis. The Title text field box beneath the Y Axis column specifies the label for the Y axis. The default for title are blank.

Grid

The Grid fields specify the interval between grid lines on the chart. The Grid field beneath the X Axis column specifies the interval for grid lines along the X axis. The Grid field beneath the Y Axis column specifies the interval for grid lines along the Y axis. The default grid Fields is 0.0 that does not display grid lines.

Type

The **Type** radio button specifies the type of graphic report. The graphic report types are: **bar**, **area**, **pie**, **plot** and **stacked bar**. The default is **bar**.

Legend

The **Legend** toggle button indicates whether the chart legend is displayed beneath the chart. By default, the legend is not displayed.

Transpose

The **Transpose** toggle button indicates whether the data sets are to be transposed. When this button is depressed, the data sets are grouped by the statistic list on the Y Axis list instead of by the item from the X Axis List. By default, data is not transposed.

In some instances, transposing the data might not be possible and CIMS for UNIX Graph displays a blank chart.

Invert

The **Invert** toggle button indicates whether the data should be displayed along the horizontal axis or along the vertical axis. By default, data is displayed along the horizontal axis (disabled).

The invert setting has no effect on pie charts.

Note • **When you have a large data set, the labels along the horizontal axis might overlap and become unreadable. You can correct this by enlarging the** `GRAPH Chart Screen` **or by inverting the chart.**

Minimum Pie Percentage

The `Pie % Min` text field indicates the minimum percentage that is displayed on a pie chart. Valid values for this field are 0 to 100. The default value is 0.0001%.

This parameter is valid only for pie charts.

Inclination

The `Inclination` text field box with increment and decrement arrows controls a 3 dimensional effect that causes the rear of the graph to appear raised n degrees above the horizon. Valid values for n are 0 to 45. The default value is 10 degrees.

This parameter affects only the bar, stacked bar and pie charts.

Rotation

The Rotation text field box with increment/decrement arrows controls a 3 dimensional effect that causes the rear of the graph to appear shifted n degrees to the right. Valid values for n are 0 to 45. The default value is 10 degrees.

This parameter affects only the bar and stacked bar charts.

Depth

The Depth text field box with increment/decrement arrows controls a 3 dimensional effect that causes the width of the vertical axis to increase or decrease. Valid values for this field are 0 to 500. By default, this field is set to 10.

This parameter affects only the bar, stacked bar, and pie charts.

Generate Graph Button

The **Generate Graph** button generates the appropriate graph. When CIMS for NT/UNIX reporting data is found, CIMS for UNIX Graph uses the data parameters to generate the #-delimited flat file. CIMS for UNIX Graph produces the graphic report based upon the flat file and the chart parameters.

Print Graph

CIMS for UNIX Graph can produce a file suitable for printing on several printer types. Supported printer formats are: Postscript, HP Laserjet, HP Paintjet and IBM 3812. In addition, CIMS for UNIX Graph can produce an X-window dump file. When a graph is displayed, the window has a file pulldown menu. Figure 5-9 presents an example of a generated graph.
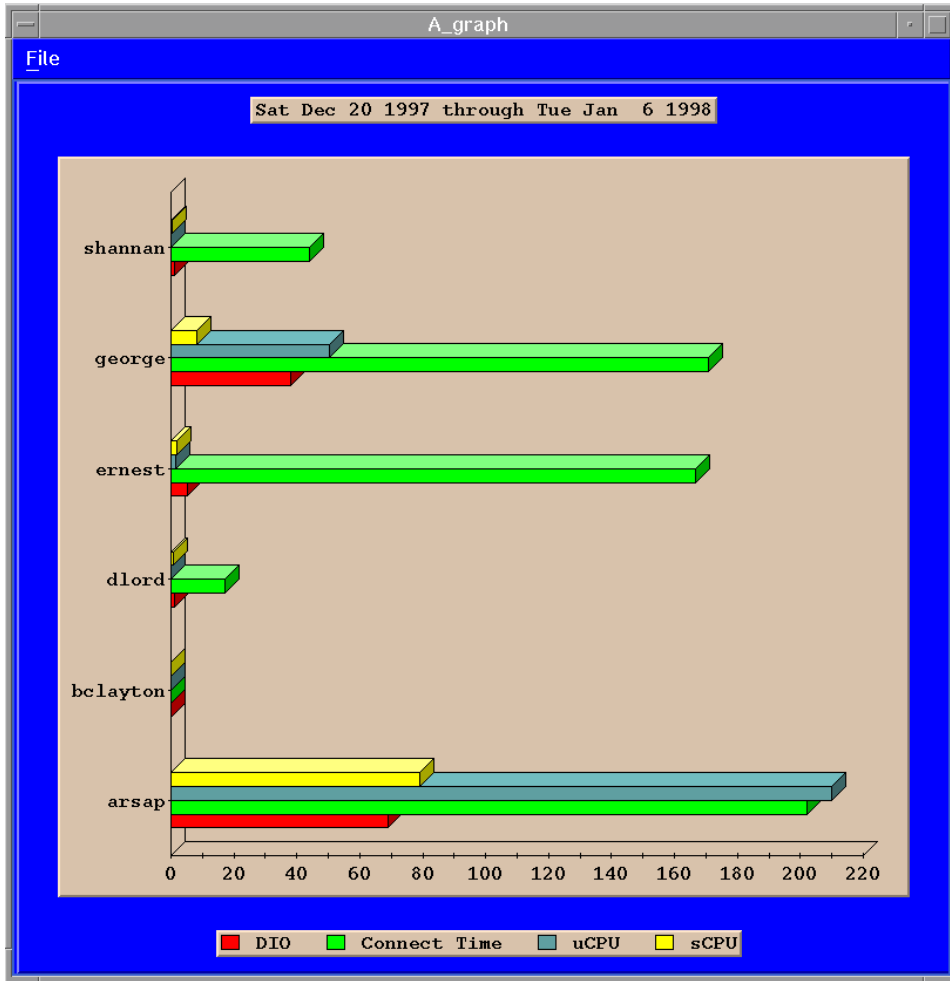
Figure 5-9 • An Example of a Generated Graph

The File menu contains two items: **Save As** and **Exit**. The **Save As** item displays the Print Graph data entry window. Figure 5-10 presents the Print Graph data entry window. You enter the file name and select the print format. You then select the **Print** button that displays the Print Parameter data entry window. Figure 5-11 presents the Print Parameter data entry window. You set the print parameters in accordance with the selected print format.
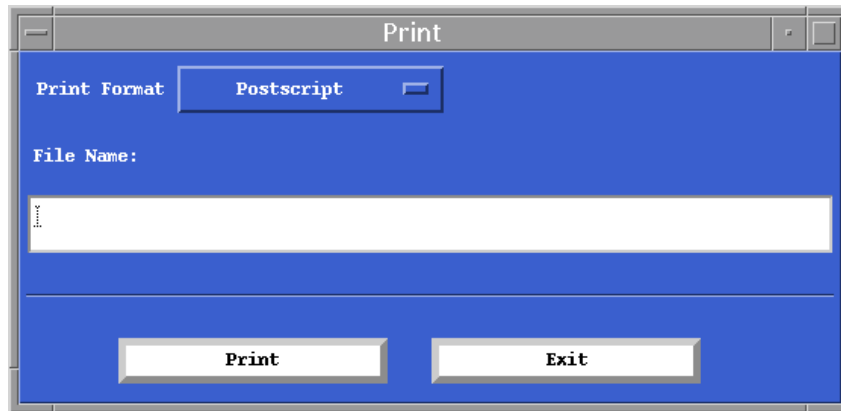
Figure 5-10 • Print Graph Data Entry Window
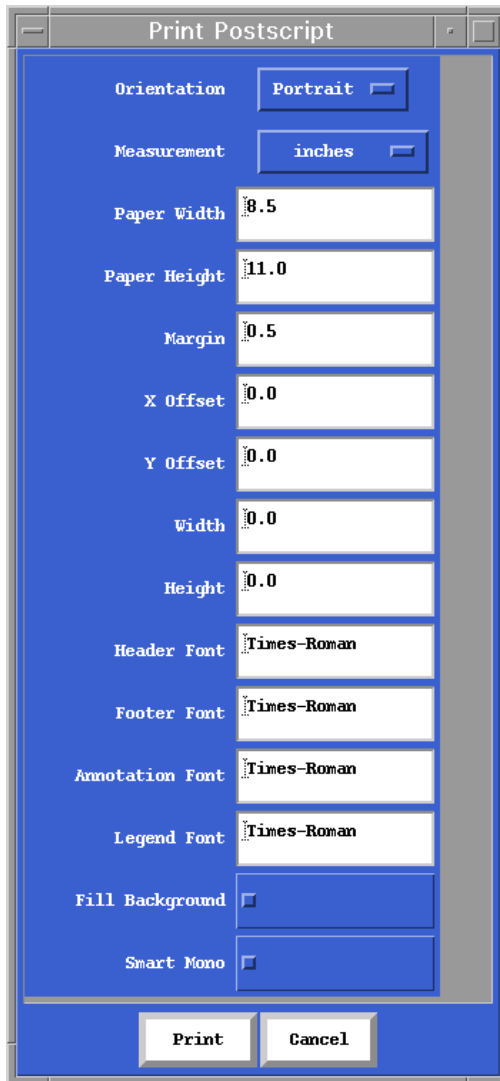
Figure 5-11 • Print Parameter Data Entry Window

Integrating Data with CIMS Desktop

To generate data to be put into CIMS Desktop, you must run one of the following scripts, gen_cims_sum, NT_gen_cims_sum, gen_cims_detail, and NT_gen_cims_detail. Here is a summary of what each script does:

■ gen_cims_sum—procedure for generating summary CIMS Resource Accounting records from consolidated CIMS for UNIX Accounting data.

■ gen_cims_detail—procedure for generating detail CIMS Resource Accounting records from consolidated CIMS for UNIX Accounting data.

■ NT_gen_cims_sum—procedure for generating summary CIMS Resource Accounting records from consolidated CIMS for NT Accounting data.

■ NT_gen_cims_detail—procedure for generating detail CIMS Resource Accounting records from consolidated CIMS for NT Accounting data.

These scripts can be setup as a job to run every night, every week, or once a month. For more information on these scripts, refer to the *CIMS Desktop Integration Guide*.

Index

CIMS Data Collector for UNIX User Guide