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SAS[®] IT Charge Management 2.4

User's Guide

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SAS® IT Charge Management 2.4: User's Guide

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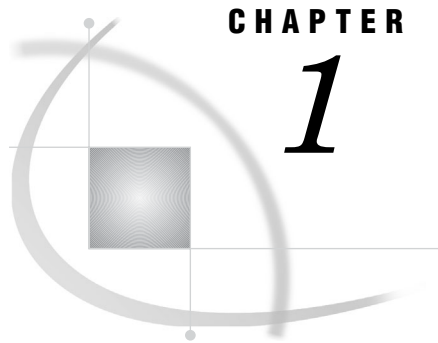
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CHAPTER

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Document Conventions

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About This Documentation

The *SAS IT Charge Management User's Guide* is a usage and reference text for the SAS IT Charge Management product.

SECTION	DESCRIPTION
Introduction	provides an overview of the basic elements of SAS IT Charge Management, its relationships with SAS IT Resource Management software and MXG software, and a description of the intended audiences for the <i>SAS IT Charge Management User's Guide</i> .
Getting Started with SAS IT Charge Management	describes how to launch SAS IT Charge Management.
Site Administration	describes administration functions.
Operation	explains the operational processing methods.
Data Exploration and Reporting	covers data exploration and reporting.
Administrative Status	explains the use of SAS IT Charge Management Administrative Status.
Maintenance	provides maintenance instructions.
Appendix 1	describes File/Library Structures in detail.
Appendix 2	shows how to set up accounting codes in the style of CA-MICS in SAS IT Resource Management to input into SAS IT Charge Management key fields.
Glossary	is a dictionary of terms used with SAS IT Charge Management.

Using This Documentation

Conventions

The following conventions are used to display information in this guide:

Bold type	identifies window items. Window titles appear in bold with initial letters in uppercase type. SAS and SAS IT Charge Management keywords appear in uppercase bold type.
<i>Italic type</i>	is the style used for special terms defined in the text or the appendices and to emphasize important information.
Monospace	is used for SAS Code, scripting and JCL examples. Monospace is also used to show the values of character variables in the text.

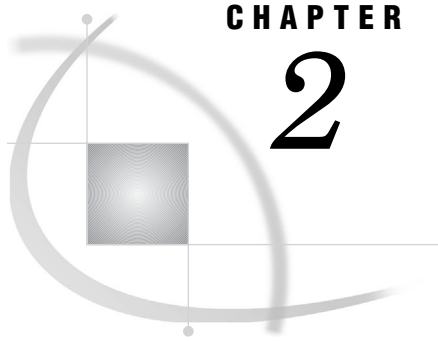
Window Images in Documentation

Window images are manipulated to fit the text of this user's guide. The images on your window can appear different from the ones in the user's guide.

Technical Support

Please be sure you include the following information when you contact us:

- the version and release of SAS IT Charge Management you are using
- the name and version of your operating system on the client and server
- the version and release of the following SAS products:
 - Base SAS software on client
 - Base SAS software on server
 - SAS/CONNECT software
 - SAS IT Resource Management MXG
- any error messages or output related to the problem.



CHAPTER

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Introduction

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SAS IT Charge Management: Overview

The challenge of a chargeback system is to keep pace with the constantly changing work environment, for example:

- multiple platforms
- new technologies
- distributed applications
- services
- dedicated equipment.

A chargeback system must track and bill for these new resources while supporting production procedures for all the traditional chargeback resources. New chargeback methodologies need to be added quickly and without increased staffing.

SAS IT Charge Management software provides an open architecture to quickly implement accounting for any measurement. With IT Charge Management's interactive client/server interface, administration is reduced to a fraction of the effort required with traditional chargeback software.

Open Architecture

IT Charge Management enables you to implement whatever accounting methodology best fits your environment. Features can be selected individually. Chargeback

methodologies can be mixed. Chargeback items can be selected at your discretion and identified based upon site-specific standards. And if your applications produce measurement data, you can implement activity-based costing.

SAS IT Charge Management is a usage-based chargeback application that generates charges by applying billing rates to selected resource consumption quantities. IT Charge Management provides an intuitive and straightforward mechanism for specifying which customers are billed, which resources they will be billed for, and which billing exception conditions (charging qualifications) will be applied. IT Charge Management lets you audit the origination and calculation of all charges and use a primary currency other than the US dollar.

Extensive Data Sources for z/OS

SAS IT Charge Management for z/OS functions with SAS IT Resource Management for z/OS. IT Resource Management invokes Merrill Consultants' MXG macros to read mainframe data.

Note: MXG currently supports more than 120 sources, essentially every data source available. △

Extensive Data Sources for Open Systems

SAS IT Charge Management uses SAS IT Resource Management for Open Systems to access UNIX and distributed network measurement data from HP-OVPA (HP OpenView Performance Agent); Sun SunNet Management and Solstice; Aprisma Spectrum; and IBM NetView for AIX.

The SAS IT Resource Management Generate Source Facility and Generic Collector Facility are simple yet flexible mechanisms that can be used to add any other data source to the system.

Data Sources for Windows

SAS IT Charge Management uses SAS IT Resource Management for Windows to process data from data sources such as NTSMF.

Integration with Other SAS Software

SAS IT Charge Management utilizes a suite of SAS software solutions to provide a seamless multi-platform data warehouse. The integration of IT Charge Management with IT Resource Management software provides a superior computer measurement repository, which includes an extensive list of data sources. The IT Charge Management user interface functions as a single point of control for all supported platforms by exploiting the power of SAS/CONNECT software.

The power of SAS/EIS is used by IT Charge Management AccountView to generate interactive reporting. Several graphs and multidimensional reports are available for exploration. Enterprise Reporter sample reports and data are distributed with IT Charge Management. The sample reports show how IT Charge Management data can be used to address data center management and customer needs.

Relationships with SAS IT Resource Management Software

SAS IT Charge Management augments SAS IT Resource Management. SAS IT Charge Management uses existing IT Resource Management utilities and exit points. IT Charge Management adds new data tables to existing SAS IT Resource Management Performance Data Warehouse data structures, making it seamlessly integrated into existing IT Resource Management functionality.

Client/Server Components

SAS IT Charge Management has a user interface that significantly reduces system administration time. Software maintenance is simple and straightforward. You can tailor the system by means of window panels, which link to a relational structure of system tables. Syntax errors are identified immediately upon entry, rather than at some later point in processing.

The maintenance and administration of SAS IT Charge Management are handled through a point and click GUI located on a personal computer running Microsoft Windows. Server library updates are performed automatically by means of a SAS/CONNECT session.

SAS IT Charge Management for Open Systems

SAS IT Charge Management for Open Systems utilizes a personal computer running Windows as the client and the UNIX host system as the server.

SAS IT Charge Management for z/OS

SAS IT Charge Management for z/OS utilizes a personal computer running Windows as the client and the z/OS host system as the server.

SAS IT Charge Management for Windows

SAS IT Charge Management for Windows utilizes a personal computer running Windows as the client and a Windows Server platform as the server.

Target Audience

SAS IT Charge Management was designed primarily for the chargeback administrator who has to "do it all". This means collect the data, apply the charges, maintain customer information, know who to charge what and how much, generate invoices and reports, enter supplemental charges, administer discounts, and so on. However, at some sites these tasks can be distributed among several individuals. This section describes how these tasks can be broken down and which sections of this user's guide are pertinent to each task group.

Installation and Maintenance

The tasks performed for this function include the initial installation of SAS IT Charge Management, the verification that the client runs properly on the personal computer, and the verification that batch jobs or scripts run properly on the server. Additionally, the individual or group performing these tasks can be responsible for the application and verification of periodic maintenance.

The SAS IT Charge Management user's guide sections that are appropriate for these tasks are:

- Introduction. Start with "SAS IT Charge Management: Overview" on page 3.
- Getting Started. Start with "Getting Started with SAS IT Charge Management: Overview" on page 7.
- Maintenance. Start with "Maintenance: Overview" on page 111.

Chargeback Administration

The chargeback administrator is the primary user of SAS IT Charge Management. The administrator selects the resources to charge for, defines new resources, implements rates and rate modes, assigns profiles to customers, defines the accounting calendar and invoicing schedule, and verifies the invoice and reports before they are turned over to the end users.

The chargeback administrator should review the entire user's guide.

Operations/Data Entry

The person or group that performs this function is responsible for running batch jobs or scripts and for verifying that each job or script completed successfully. Additionally this individual or group can be responsible for entering supplemental charges (debits and credits).

The user's guide sections appropriate for these tasks are:

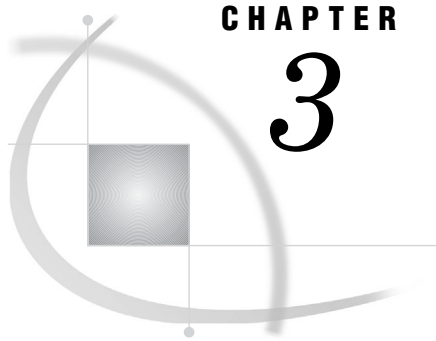
- Introduction. Start with "SAS IT Charge Management: Overview" on page 3.
- Operation. Start with "Operation: Overview" on page 67.

End User Functions

The individuals who perform these functions are usually those being charged (data center customers) or those in control of the resources (data center management). They are interested in exploring the data and reviewing the reports.

Direct the end users to the following sections of the user's guide:

- Introduction. Start with "SAS IT Charge Management: Overview" on page 3.
- Data Exploration and Reporting. Start with "Data Exploration and Reporting: Overview" on page 89.



CHAPTER

3

Getting Started

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Getting Started with SAS IT Charge Management: Overview

Note: We are in the process of changing how we refer to the mainframe operating system. During the changeover, you may see references to MVS, or OS/390, or z/OS. △

The following sections cover these topics:

- “Launch SAS IT Charge Management” on page 7
- “Run the SAS IT Charge Management Demonstration” on page 9
- “Define a New Site in SAS IT Charge Management” on page 9
- “The ECEXIT0 Exit” on page 11
- “The ECEXIT1 Exit” on page 13
- “Change Site Properties” on page 14.

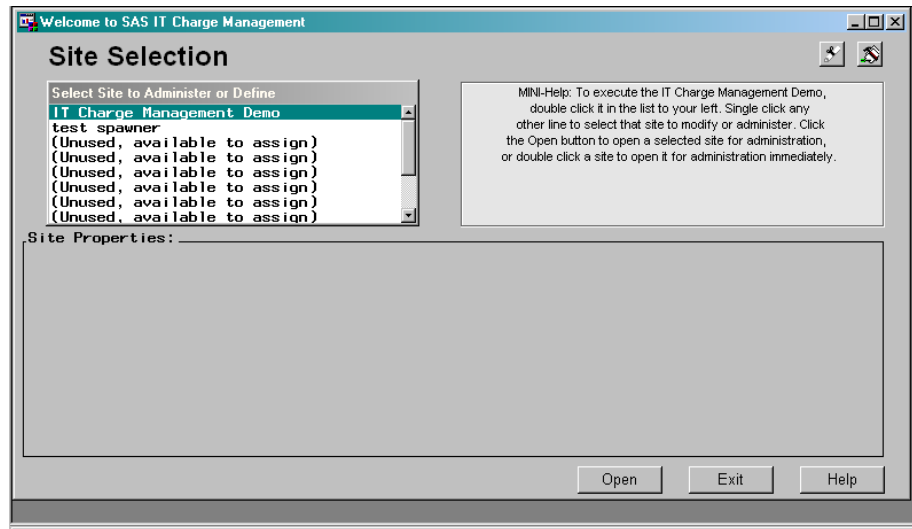
A customization checklist is included in the “Customize SAS IT Charge Management” on page 14 topic at the end of this section. It will walk you through the steps required for SAS IT Charge Management to be operational.

Launch SAS IT Charge Management

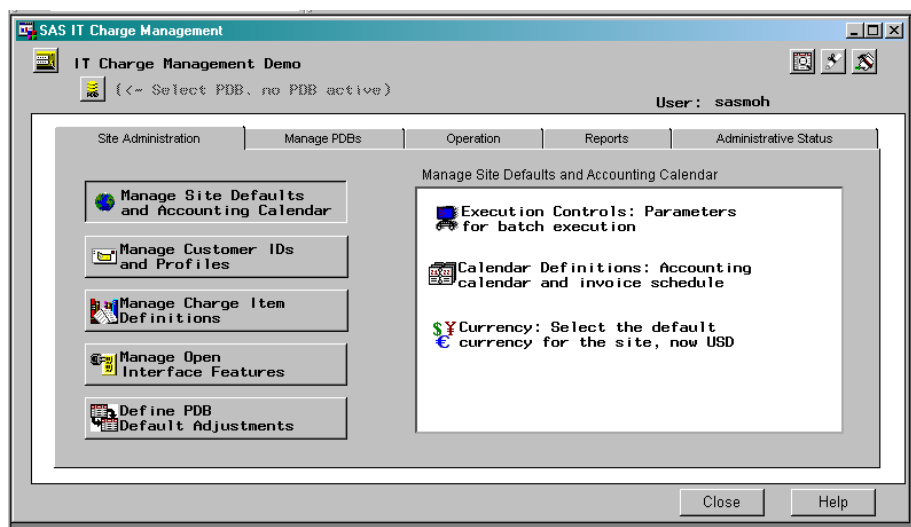
Launching SAS IT Charge Management involves connecting to the server host defined for the site you want to administer. You define the server location to SAS IT Charge Management by means of the Site Selection dialog window in SAS IT Charge Management. After the site is defined, follow the steps below:

- 1 If the server is on z/OS, log off the server host to free any allocated data sets.
- 2 From the list in the **Site Selection** box as shown below, choose the site that you want to work with. Then select to connect to that site. If you want to use a

TCP/IP connection, you can connect to the server with SAS/CONNECT script. (For more information about this, see the documentation for SAS/CONNECT in the online SAS Help and Documentation.) If you want to set up a new site, see “Define a New Site in SAS IT Charge Management” on page 9.



- 3 You will be prompted for a logon userid and password for the site you selected. For z/OS, the userid is the one for your TSO application that is specified in the SAS/CONNECT script. For UNIX, the userid is the one for your UNIX machine that is specified in the SAS/CONNECT script.
- 4 The first time a SAS IT Resource Management server host is selected for use with SAS IT Charge Management (by selecting **Site Selection**), a new set of libraries is created and populated on the server. These libraries contain the server specific code and data for SAS IT Charge Management. The libraries are created and loaded automatically. You will see boxes pop up on the client window showing file transfer messages between the server and the client.
- 5 After the logon is complete, the SAS IT Charge Management main menu is presented.



- 6 If the server is on z/OS, the TSO userid that you use to log on determines where your PDBs are stored. When a SAS IT Resource Management administrator defines a PDB on z/OS, SAS IT Resource Management creates an entry identifying that PDB in an internal table. IT Resource Management stores this table in the SASUSER library. There is a unique SASUSER library for each userid. Thus, if you use SAS IT Charge Management with a userid that has never accessed certain PDBs, then those PDBs will not be listed in the Manage PDBs window in SAS IT Charge Management.

Run the SAS IT Charge Management Demonstration

SAS IT Charge Management software includes a sample site. This site uses Windows as the server and has a PDB with data from Windows servers. To access this demonstration,

- 1 launch SAS IT Charge Management
- 2 on the Site Selection window, select the site called **SAS IT Charge Management Demonstration**
- 3 select in the lower right corner of the window.

This enables you to explore all of the features and functions of SAS IT Charge Management without having to load your data first.

Define a New Site in SAS IT Charge Management

Site Properties are only displayed after a site is selected from **Select Site to Administer or Define**.

Note: However, if you select the SAS IT Charge Management demonstration site, no site properties will be displayed. △

On the bottom half of the Site Selection window, you can specify the **Site Properties**. **Site Properties** identify the server to the client. The **Site Properties** include the following information on the server: SAS IT Resource Management data set high-level qualifier, path or root directory, and the location of the site library you want to use. Site properties for the client include your TCP/IP node name and SAS/CONNECT logon script name for use with the site specified. After the prefix and site library are specified, use to save the site information for use with SAS IT Charge Management.

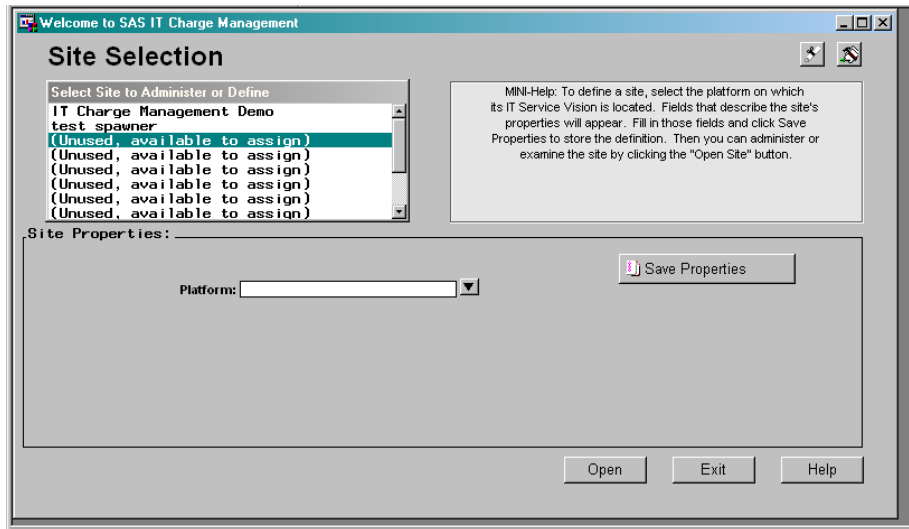
- **Select Site:** In the **Select Site to Administer or Define** selection box, select an unassigned site name to identify a new site in SAS IT Charge Management. [Unassigned sites are identified by the comment **Unused, available to assign.**] The **Site Properties** section of the window shows the **Platform** field.

A description of each of the fields in **Site Properties** follows. The list of fields differs depending on the platform you choose. The descriptions of two exit points (ECEXIT0 and ECEXIT1) in the client/server connection are included in this list as well.

- **Platform Field:** If you select an unassigned site name, under **Site Properties**, the **Platform** field appears. By selecting the **Platform** field, you are presented

with a pull-down menu of the platform and connection-type combinations that are available. Select the platform desired. That platform name will be used to fill in the field. Depending on the platform you choose, you must specify different information based on your server's requirements. You might be requested to provide a TCP/IP name or an IP address for your server in the TCP/IP Node field or to specify an emulator short session name.

If you select **MVS via Spawner**, you are prompted to enter the **Remote Host Name and Port** and the **Logon Script Name** fields.



- **Site Description:** After the platform is specified, additional fields are displayed, including **Site Description**. This name uniquely identifies the SAS IT Resource Management data from a particular server installation that you want to use as input to SAS IT Charge Management. The Site Description must be between 1 and 32 characters in length. It can contain embedded blanks. Leading and trailing blanks are ignored.
- **Remote Host Name and Port:** You must specify the name of your remote host along with the alias of the port for the spawner connection to MVS. The format for this field is: *remotehostname:port*. This is an example of an entry for this field: *s390deva.mvs.company.com:5478*.

Note: This field is only available if you selected a platform of *MVS via Spawner*. △

- **Logon Script File:** You can specify the path and filename of your SAS/CONNECT logon script. The SAS/CONNECT logon script sets up the SAS/CONNECT environment for SAS IT Charge Management. You can use one of the default logon scripts that are provided with SAS IT Charge Management or a user-provided script. When you select this field, an Open File dialog box appears. Use this dialog box to provide the location of your script, then select **OK**.

If you selected the *MVS via Spawner* platform in the earlier step, the **Logon Script File** field is optional. If you choose to use the script file, do not specify the “nosasuser” option after issuing the command that executes SAS in your remote system. This is an example:

```
type 'ex 'sasjtr.tso.clist(ads3)' '; /* executeSAS in the remote system */
type ' ' ' o('dmr,comamid=TCP,noterminal,no$syntaxcheck')' ' LF;
```

- **IT Charge Mgmt Site Prefix:** Specify the SAS IT Charge Management prefix that you want to use on the server in the **SAS IT Charge Management Site**

Prefix field. SAS IT Resource Management has two groups of libraries: libraries common to the entire site and libraries specific to a PDB. If the server is on z/OS, each of these groups of libraries has its own high-level qualifier. If the server is on Open Systems or Windows, each has its own path. There is one Site group of libraries per server installation of SAS IT Resource Management and one PDB group of libraries for each PDB. The SAS IT Charge Management Site Prefix can be the same as the SAS IT Resource Management prefix, but SAS IT Charge Management does not require it to be the same as SAS IT Resource Management.

For example, if the server is on z/OS and the name of the SAS IT Resource Management PDB that you want to use for chargeback has data set names that begin with **SASPROD.CPE.SMFPDB** and your SITELIB is **SASPROD.CPE.SITELIB**, then you specify the prefix as **SASPROD.CPE**.

Note: Neither quotes nor a trailing period is required. △

Press **Enter** or select **OK**. The SITELIB line is filled in with the *prefix.SITELIB*, for example, **SASPROD.CPE.SITELIB**. If you have trouble determining your site prefix, please contact SAS Technical Support.

- **IT Resource Mgmt Sitelib:** After you specify the SAS IT Charge Management Site Prefix, the **SITELIB** field is automatically filled in for you as *prefix.SITELIB* or *prefixpath/sitelib*. If you have a different SAS IT Resource Management site library that you want to use, you can overwrite the library name with the one you want to use.
- **Save Properties:** After you are satisfied with your specifications, select **Save Properties**. The list box in the upper left corner of the window shows the **Site Description** of the newly defined site.
- To specify additional sites, select another **unused, available to assign** line in the list box and repeat the above steps.

The ECEXIT0 Exit

ECEXIT0: The ECEXIT0 exit enables the SAS IT Charge Management administrator to change any previously defined global macro variables. This exit is included before the SAS/CONNECT signon. The most common use of the exit is to assign z/OS allocation parameters to the global macro variables called ECLIBNEW and ECLIBMOD.

Here are some of the global macro variables that can be changed or tested in this exit.

- The value of ECLIBNEW is the disposition parameter appended to LIBNAME and FILENAME statements that allocate all new SAS IT Charge Management libraries on the server machine (z/OS host). You can use it to add UNIT=, VOLSER=, STORCLAS=, and DISP= parameters to the FILENAME and LIBNAME statements that allocate SAS IT Charge Management libraries on the server machine. You *cannot* use it to change the following: RECFM=, BLKSIZE=, LRECL=, SPACE=. ECLIBNEW is a macro variable that is usually changed in this exit by using a macro assignment statement, such as:

```
%LET ECLIBNEW=value;
```

- The value of ECLIBMOD is the allocation parameter appended to FILENAME statements that allocate temporary SAS IT Charge Management work files on the server machine (z/OS host). ECLIBMOD is a macro variable that is usually changed in this exit by using a macro assignment statement, such as:

```
%LET ECLIBMOD=value;
```

- The value of ECS_P is the platform type that can be APPC, MVSEHLL, MVSTCP, UNIXTCP, WINSC, or DEMO. The value comes from the pull-down menu for the

Platform field on the **Site Properties** area of the Site Selection window. ECS_P can be used in ECEXIT0 to limit the changes to a particular platform. ECS_P is a macro variable that is usually tested in this exit by using a macro comparison, such as:

```
%IF X&ECS_P EQ XMVSEHLL %THEN %DO;.....;
%END;
```

- The value of ECS_SNAM is the site name that is exactly the name of the site as listed in the **Select Site** list box (specified in **Site Description** under **Site Properties** on the Site Selection window). ECS_SNAM can be used in ECEXIT0 to limit the changes to a particular site. This is a macro variable that is usually tested in this exit by using a macro comparison, such as:

```
%IF X&ECS_SNAM EQ XCARY %THEN %DO;.....;
%END;
```

- EC_DFMT is another global macro variable. The value of EC_DFMT is the SAS date format you want SAS IT Charge Management to use. This format is used to display date values throughout SAS IT Charge Management. Always specify the complete format name (including the period). The default value of EC_DFMT is DATE9. This global macro variable is directly assigned to a SAS date format, such as:

```
%LET EC_DFMT=DATE9.;
```

Since ECEXIT0 is included prior to the SAS/CONNECT signon, it can also be used to set any necessary SAS/CONNECT options. Some sample option settings that might be required for connections that use the APPC access method are:

```
options comamid=appc set appc_secure_prompt
      set=appc_lu62mode mappc=32 remote=remotelu
      set=luprefix sascon set=lufirst 01 set=lulast 30;
```

The default location of the exit is: **drive:\[SAS Install Path]\cpe\chm\ec\ecsite\ecexit0.sas**

Use the SAS editor or another text editor to update the contents of ECEXIT0.SAS. The contents of ECEXIT0.SAS as shipped are:

```
/* ecexit0 point */
/* placement before connect signon */
```

The above code means that the default values are to be used. The default allocations use no VOLSER, and the default UNIT is the same as the one that would be used by default in any SAS FILENAME statement.

The example below assumes the server is on z/OS. In this example, the default value of ECLIBNEW sets the disposition of the new libraries to NEW,CATLG, and the default value of ECLIBMOD sets the disposition of the sequential work files to MOD,DELETE,DELETE:

```
%let eclibnew=%STR(DISP=(NEW,CATLG));
%let eclibmod=%STR(DISP=(MOD,DELETE,DELETE));
```

Member ECEXIT0.SAS can be coded and placed in the ECSITE directory *on the SAS IT Charge Management client*. The ECSITE directory default path is: **drive:\[SAS Install Path]\cpe\chm\ec\ecsite**

Code parameters as they would be specified on a SAS FILENAME or LIBNAME statement.

Here are examples of what ECEXIT0.SAS can be altered to contain:

1 Adjusting z/OS Allocations for All Sites

This first example can be used for a SAS IT Charge Management installation that either has only one defined z/OS site, or that has multiple z/OS sites defined, which will all use the same values for ECLIBNEW and ECLIBMOD.

UNIT and VOLSER are added to the FILENAME and LIBNAME statements for allocating SAS IT Charge Management libraries on the z/OS host.

```
/* ecexit0 point */
%let eclibnew=%STR(DISP=(NEW,CATLG)
                  UNIT=MYDISK VOLSER=DISK97);
%let eclibmod=%STR( UNIT=MYDISK VOLSER=DISK97 );
/* placement before connect signon */
```

2 Adjusting z/OS Allocations for Selected Sites

This second example can be used for a SAS IT Charge Management installation that has multiple defined sites that are not all z/OS sites.

In this example, the macro variable ECS_P is tested to limit the changes to z/OS sites only. z/OS sites at this installation use STORCLAS for file allocations.

```
/* ecexit0 point */
%IF X&ECS_P EQ: XMVS %THEN %DO;
%let eclibnew=%STR(DISP=(NEW,CATLG) STORCLAS=X);
%let eclibmod=%STR( STORCLAS=X);
%END;
/* placement before connect signon */
```

The ECEXIT1 Exit

The ECEXIT1 exit enables the SAS IT Charge Management administrator to send commands to the server immediately after the connection is completed. This exit is included after the SAS/CONNECT signon. The most common use of the exit is to perform remote submits.

The default location of the exit is: **drive:\SAS\cpe\chm\ec\ecsite\ecexit1.sas**

Use the SAS editor or another text editor to update the contents of ECEXIT1.SAS. The contents of ECEXIT1.SAS as shipped are:

```
/* ecexit1 point */
/* placement after connect signon, before first executable */
```

The above code means that the default is to do nothing.

Member ECEXIT1.SAS can be coded and placed in the ECSITE directory *on the SAS IT Charge Management client*. The ECSITE directory default path is: **drive:\[SAS Install Path]\cpe\chm\ec\ecsite**

Code that is to be sent to the server must be surrounded by **RSUBMIT;** and **ENDRSUBMIT;** statements.

Here is an example of what ECEXIT1.SAS can be altered to contain:

Using Exits to Submit Code to the Server

This example can be used for a SAS IT Charge Management installation that wants to send SAS system options to SAS running under the APPC server. The options are passed immediately after signon.

```
/* ecexit1 point */
rsubmit;
options noerrorabend s=0;
```

```
endrssubmit;
/* placement after connect signon, before first executable */
```

Change Site Properties

Sometimes you need to change where a site's libraries are to be stored or to update a high-level qualifier part of a library. To make the changes:

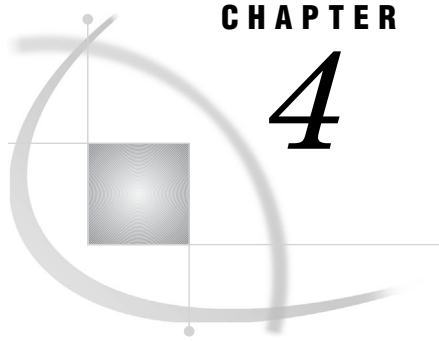
- 1 launch SAS IT Charge Management
- 2 select the site you want to modify from the Select Site window's list box and press
- 3 when the lower half of the window displays the **Site Properties** for the selected site, move your cursor to the field that you want to change and make your changes
- 4 Select .

Customize SAS IT Charge Management

This customization section provides an overview of customizing SAS IT Charge Management. The length of time that it will take you to complete this checklist depends on the complexity of your environment and on the number of SAS IT Charge Management features that you choose to exercise. Many features are optional or have the most commonly used value specified as the default.

Steps for Customization are:

- 1 Complete the tasks under the Site Administration tab. (Start with "Site Administration: Overview and Navigation" on page 16.)
- 2 Complete the tasks under the Manage PDBs tab. (See "Manage PDBs" on page 56.)
- 3 Execute one or more daily process and reduce steps. (For more information on this topic, see "Update the Process and Reduce Tasks" on page 69.)
- 4 Execute a partial Invoice Period Consolidation using the steps under the Operation tab. (Start with the "Operation: Overview" on page 67.)
- 5 Assign any charges that are currently unassigned. See the topic on *Unassigned Charges and Suspend Processing in the Operation* section called "Daily SAS IT Charge Management Administrator Tasks" on page 77.
- 6 Set up and run reports using the Data Exploration and reporting tab. (Start with the "Data Exploration and Reporting: Overview" on page 89.)
- 7 Analyze results.
- 8 Repeat these steps until satisfied.



CHAPTER

4

Site Administration

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Site Administration: Overview and Navigation

This section describes in detail how to administer SAS IT Charge Management by using the Site Administration and Manage PDBs tabs on the SAS IT Charge Management main menu. The order of this section follows the menu flow of the SAS IT Charge Management client GUI. Each tab is discussed in turn, along with tasks and action items.

Navigation

The SAS IT Charge Management GUI has tab menus that reflect the major functional areas of Site Administration, PDB Management, Operations, and Reporting. Additionally, the Administrative Status tab displays a dynamic list of the activities completed for each Site and PDB selected. The following functions are available on many of the dialog boxes in SAS IT Charge Management:

Site Selection



Site Selection on the top left of the window enables you to change the site you are working with. (See “Getting Started with SAS IT Charge Management: Overview” on page 7.) Next to the button is the name of the active site.

PDB Selection



PDB Selection on the top left of the window (just below **Site Selection**) enables you to change or close the PDB you are working with. (See “PDB Selection” on page 55.) Next to the button is the name of the active PDB. If no PDB is active, *No Active PDB* is displayed in gray.

Display Status



This button takes you directly to the Detailed Status section. (For more information, see “Detailed Status” on page 77.)

About



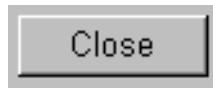
The button with a scroll shows the “About” information for SAS IT Charge Management.

Maintenance Information



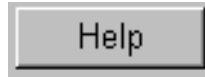
The button with tools shows the latest maintenance status for this SAS IT Charge Management client.

Close Site or
PDB



This button either closes the Site and disconnects you from the server, or it enables you to deactivate the active PDB, after which you can choose to activate another PDB or leave all PDBs deactivated.

Help



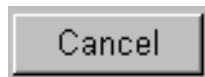
This button displays a window from which you select information specific to the SAS IT Charge Management topic you are looking at, the **About** information, or topics from the SAS IT Charge Management User's Guide.

OK



OK accepts your changes and returns to the previous window.

Cancel



Cancel removes your changes and returns the fields to the previous values.

Apply



Apply accepts your changes but does not return to the previous window. This enables you to make multiple changes and see their effects without leaving the dialog box.

Reset



Reset removes all changes and returns all fields to their default values.

Functional Area
Tabs



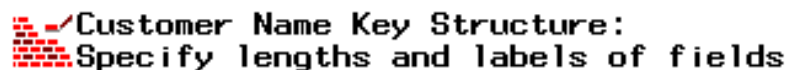
Functional Area tabs enable you to select the main operational areas of SAS IT Charge Management. Selecting a tab moves that tab and its menu to the front of the window.

Menu



Menu buttons are on the left side of the Site Administration, and Manage PDBs tab. Selecting a menu button causes the sub-window on the right side of the current tab to be updated.

Sub-window
Task's Action
Items

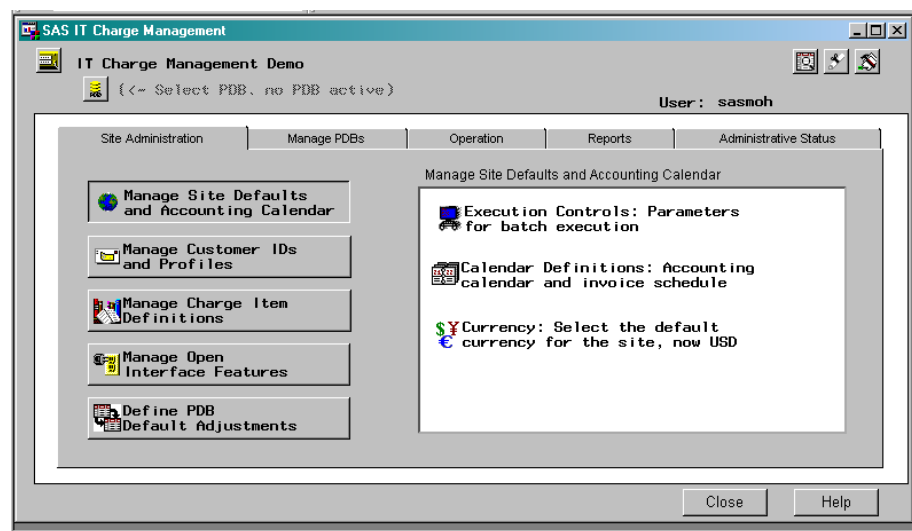


The sub-window is the right side of the Site Administration and Manage PDBs tabs. The sub-window lists the action items for the menu button that you selected. Selecting one of the task's action items takes you to a dialog box for that action item.

Site Administration Functions

The Site Administration tab is the first tab on the SAS IT Charge Management main menu. If its contents are not visible, select the tab.

The Site Administration functional area is where you define and maintain all operations and parameters that are either site-level defaults or that never vary across the PDB environment. When you open a site for the first time, Site Administration opens. (The Site Administration window follows the rules discussed in the Navigation section.)



Manage Site Defaults and Accounting Calendar

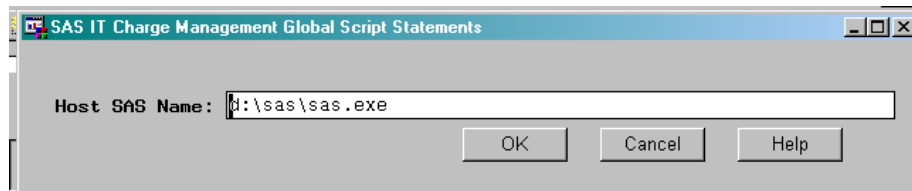
Manage Site Defaults and Accounting Calendar is the top button on the left side of the Site Administration tab. This area is used to specify parameters common to all PDBs in the site (server installation of SAS IT Resource Management). The types of parameters you can specify here are execution controls, JCL (z/OS only), fiscal calendars, and invoicing dates.

Selecting **Manage Site Defaults and Accounting Calendar** changes the right side of the tab to show a list of the action items you can perform. Selecting the menu selection area for an action item takes you to the dialog box for that action item.

Execution Controls

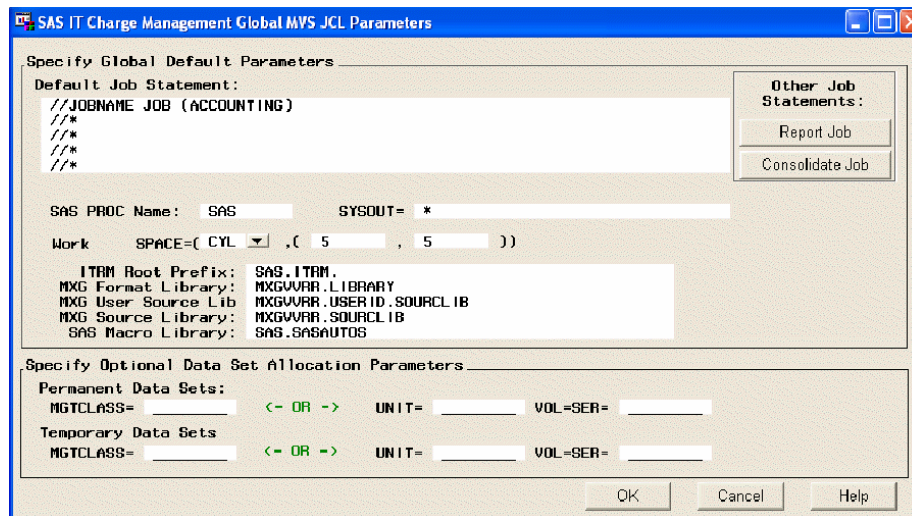
Execution Controls is the first task under Manage Site Defaults and Accounting Calendar. This task enables you to specify the location of the program that executes SAS that you want to use on the server. If the server is on z/OS, the Execution Controls window provides space for the additional information that is required for setting up JCL.

If the server is on UNIX or a Windows platform, the Global Script Statements dialog window displays:



Specify the name of the SAS program on the server (UNIX or Windows machine) that you want SAS IT Charge Management to use. You do not need to specify an extension or a path. If you do not want to save your changes, select **Cancel**. If you make a change and want to save it, select **OK**.

If the server is on the z/OS platform, the Global Script Statements dialog window displays:



The purpose of this dialog window is to gather information about your z/OS environment so that the JCL can be generated for various SAS IT Charge Management jobs. The upper-right corner of the window shows the jobs for which the JCL parameter values apply. If you want to specify parameters for a different job, select the button for that job. When you are finished with your specifications, select **OK**. If you want to return to the parameters that were displayed when you entered the dialog, select **Cancel**. The following table shows each of the parameters on the window, descriptions of these parameters, and the default values:

Table 4.1 Table of Parameters

Field	Description	Defaults
Default Job Statement	Specify the job control cards exactly as you want them to appear in the JCL. CAUTION: If the Job Statement is not valid according to your site's standards, SAS IT Charge Management will be unable to proceed, often without a message to that effect. △	No valid default.
SAS PROC Name	The SAS procedure that you want the job to use in the EXEC statement.	Defaults to SAS.
SYSOUT=	Output class for print.	Defaults to *.
Work SPACE=	Type and amount of primary and secondary storage for work area. Depending on the amount of data to be processed, you can increase these values from the default.	Defaults to CYL,5,5.
SAS IT Resource Management Root Prefix	The high-level qualifiers of the SAS IT Resource Management software that you want to use with SAS IT Charge Management. Do not put quotes around the value.	Defaults to SAS.
MXG Format Library	Fully qualified data set name for the library that contains the MXG SAS formats. Do not put quotes around the value.	Defaults to MXG $vvrr$.LIBRARY where vv is the MXG version number and rr is the MXG release number.
MXG User Source Library	Fully qualified data set name for the PDS that contains your changes to MXG source modules. Do not put quotes around the value.	Defaults to MXG $vvrr$.USERID.SOURCLIB where vv is the MXG version number and rr is the MXG release number.

Field	Description	Defaults
MXG Source Library	Fully qualified data set name for the library that contains the distributed MXG source modules. Do not put quotes around the value.	Defaults to MXG \overline{vvrr} .SOURCLIB where \overline{vv} is the MXG version number and \overline{rr} is the MXG release number.
SAS Macro Library	Fully qualified data set name for the file that contains your SAS System macros. Do not put quotes around the value.	Defaults to SAS.SASAUTOS.
MGTCLASS=	SMS Management Class specification. If you specify this parameter, you can neither specify UNIT= nor VOL=SER=. If the value is specified, then the parameter and its value are included in the JCL.	The default is a null value (do not specify).
UNIT=	Storage unit specification. If you specify this parameter, you cannot specify MGTCLASS=. If the value is specified, the parameter and its value are included in the JCL.	The default is a null value (do not specify).
VOL=SER=	Volume serial specification. If you specify this parameter, you cannot specify MGTCLASS=. If the value is specified, the parameter and its value are included in the JCL.	The default is a null value (do not specify).

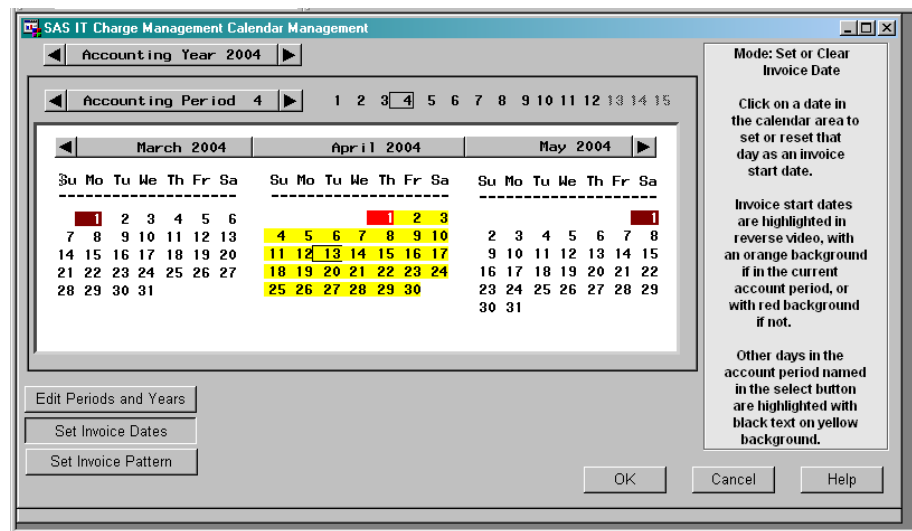
Accounting Calendar

Calendar Definitions is the second task under **Manage Site Defaults and Accounting Calendar**. This window enables you to define a fiscal calendar that differs from the Gregorian calendar. The derived fields of E0DAY, E0MONTH, and E0YEAR are stored as CLASS variables in the SAS IT Charge Management output files. An additional variable, the Invoice Period Start Date, is added to the summarized files.

Note: The Gregorian calendar is the default calendar. Similarly, by default, invoices are produced monthly. Use the SAS IT Charge Management Accounting Calendar window to adjust the accounting periods and invoicing schedules to the needs of your organization. △

Define the fiscal calendar

- 1 Select **Site Administration ► Manage Site Defaults and Accounting Calendar ► Calendar Definitions**
- 2 The following dialog window appears:



- 3 Use the left and right arrow keys to select the **Accounting Year** and **Accounting Period**. If you plan to backload data from previous years, contact SAS Technical Support to learn about additional considerations.
- 4 Select **Edit Periods and Years** to define the Accounting Calendar. After the Accounting Calendar is selected, other buttons display that enable you to specify the accounting calendar by specific dates or to select a predefined pattern.
- 5 If you want to use a predefined pattern, select **Set Year Pattern**. If any of the standard year patterns are suitable, select the pattern name in the list. The calendar updates automatically.
- 6 Otherwise, click **Edit Period** in order to specify each period's start and end dates on the calendar that is provided. For more information, see the mini-help box on the right side of the window.

Invoice Schedule

This facility enables the user to define an Invoice Schedule. The accounting calendar dialog box is used to set the anticipated schedule for invoice generation. The schedule is referenced as charges accumulate.

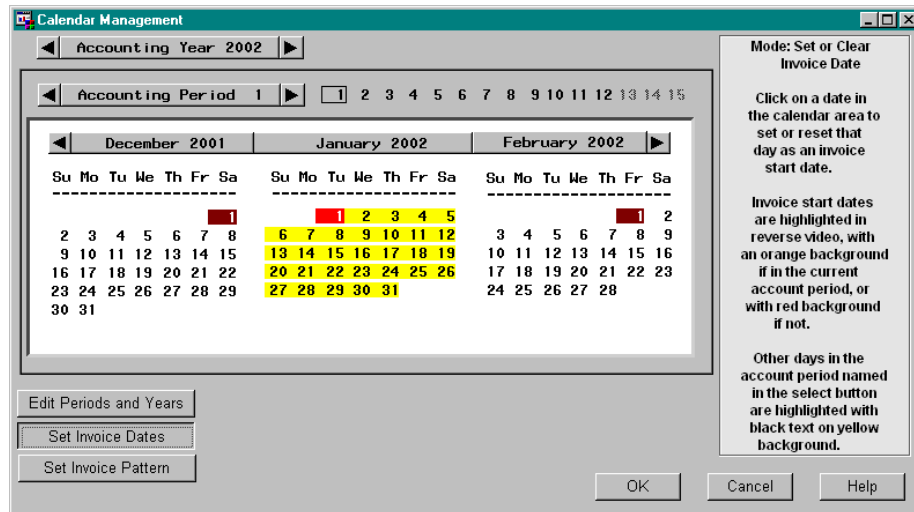
The invoice period variables are used to subset data for invoicing and reporting.

Tip: The dates specified in the Invoice Schedule are the dates that the invoice periods end - not the dates on which the invoices are issued.

Note: By default, invoices are produced monthly. Use the SAS IT Charge Management Accounting Calendar window to adjust the accounting periods and invoicing schedules to the needs of your organization. △

Set the Invoice Schedule

- 1 Select **Site Administration ► Manage Site Defaults and Accounting Calendar** to display the following window:



- 2 Use the left and right arrow buttons to select the **Accounting Year** and **Accounting Period** that you want to use.
- 3 Select **Set Invoice Dates** at the bottom of the window.
- 4 You can use **Set Invoice Pattern** to select an invoice schedule from a predefined pattern list.

Default Currency

Description:

The **Currency** task item enables you to choose a site-level currency. This currency will be used to display initial currency values in various windows in the SAS IT Charge Management client. It is used on all reports and data exploration areas in SAS IT Charge Management, unless you override it in an invoice profile or in a rate model. See “Customer Profile Information” on page 29 to specify the currency at the profile level.

Default:

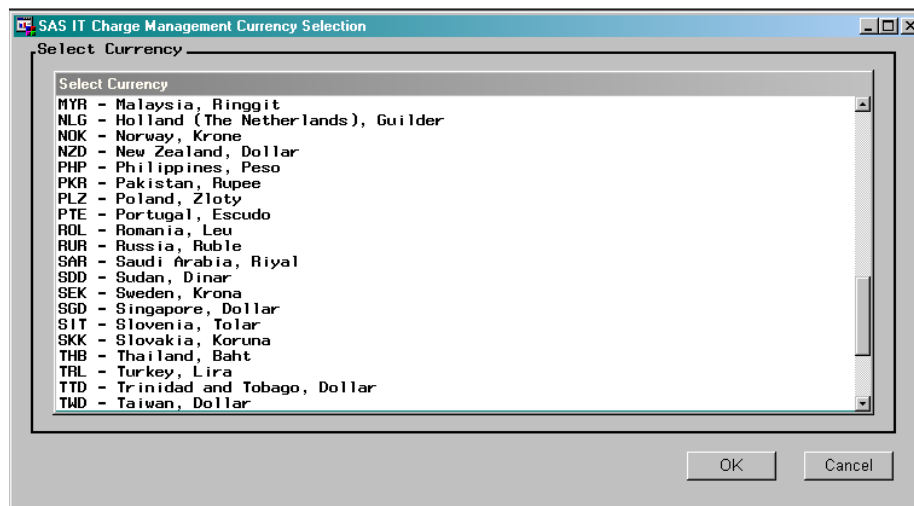
The default value is the U.S. dollar.

Location:

Select **Site Administration ► Manage Site Defaults and Accounting Calendar ► Currency**

Activation:

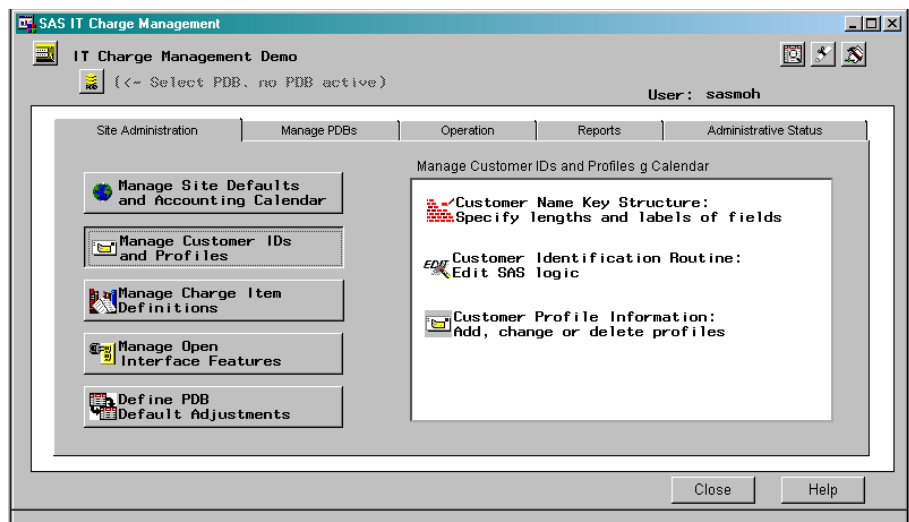
- 1 Select the **Currency Default** option. A scrollable list appears with all currencies that are recognized by SAS IT Charge Management.



- 2 Select the desired default currency from the list by clicking it. This highlights the selected currency.
- 3 Select **OK** to accept the selection, or **Cancel** to keep the previously selected default currency. Selecting either button returns you to the Site Administration tab. The default currency is listed in the **Currency** option area on the right side of the window.

Manage Customer IDs and Profiles

This functional area lets you maintain information that identifies customers. Select **Site Administration ► Manage Customer IDs and Profiles** to list the customer definition tasks. The sub-window on the right side of the Site Administration tab changes to list the action items for this area:



Customer Name Key Structures

Description:

SAS IT Charge Management maintains up to nine variables of character data that can be used collectively as the primary component of the variable list on the CLASS statement during table summarization. Each of these "customer keys" (E0CUST1 - E0CUST9) is a separate and distinct variable in the table summarization key and helps to identify the customer. You can customize the **LENGTH** and **DESCRIPTION** attributes of the customer keys. The **AUDID** field is available for storing any values that might help in an audit trail. The **AUDID** variable is kept on the SAS IT Charge Management files in the SAS IT Resource Management Detail level only.

On the right side of the dialog box is a box labeled **Number of Keys for Invoicing**. This box must contain a number from 0 through 9. The customer key fields have a hierarchy. The higher the number on customer key field names, the deeper the level of the hierarchy. For example, Key 1 is the highest level in the hierarchy, and Key 9 is the deepest level of the hierarchy. Specify the level that should be issued the invoices. Zero (0) in the box indicates that you do not want to use the following standard features: customer profiles, budgets, invoice formats, or charge item groups.

Note: The number specified in the box is used to build the key file which contains all the values of all the keys encountered in the data processed. It is used to populate the "assign keys" window when creating a new customer profile. △

Default:

The defaults are as follows:

Table 4.2 Default Table for Customer Name Keys

Field	Length	Description
Key 1	1	(undefined)
Key 2	1	(undefined)
Key 3	1	(undefined)
Key 4	1	(undefined)
Key 5	1	(undefined)
Key 6	1	(undefined)
Key 7	1	(undefined)
Key 8	1	(undefined)
Key 9	1	(undefined)
AUDID	1	Audit ID

Location:

Select **Site Administration ► Manage Customer IDs and Profiles ► Customer Profile Information**

Activation:

1 Select **Manage Customer IDs and Profiles ► Customer Name Key Structure**The Customer Name Key Structure window opens:

Field	Length	Description
Key 1:	32	Division
Key 2:	12	Department
Key 3:	1	(undefined)
Key 4:	1	(undefined)
Key 5:	1	(undefined)
Key 6:	1	(undefined)
Key 7:	1	(undefined)
Key 8:	1	(undefined)
Key 9:	1	(undefined)

AUD ID: 32 Audit ID

Number of keys to use for profile assignment: 2

OK Cancel Help

- 2 For each key, enter the desired values for the length and description attributes. (The key can contain up to 70 characters.)
- 3 Select **OK** to save your changes or **Cancel** to delete your changes.

Note: When you change a customer's key structure (length or description), SAS IT Charge Management only updates the data dictionary definitions for the "E" tables; it does not delete any data from those tables. For example, if you were charging for table SAPR3S, the EAPR3S table dictionary information would be updated, but the charge data itself would remain intact in the dataset. SAS IT Charge Management will delete all data and dictionary definitions for the ETRACK table and then will rebuild that table to reflect any changes made to the customer name key structure by means of the GUI. △

Customer Identification Routine

Description:

Charge data comes from many sources and represents resources consumed by data center customers. This task lets you specify how to assign chargeable resources to those you bill. In some cases, the data center customers are internal to the organization, while in other cases, such as with outsourcers, they are external to the organization. Use of these resources must be mapped back to the consumers in order that those identified can be billed. The key identification routine is invoked during the generation of charges, which applies site-dependent logic to populate the E0CUST1 - E0CUST9 customer key variables.

E0CUST1 - E0CUST9 contents vary in length according to what is specified in the Customer Name Key Structure window. The contents of each of these variables also vary according to the data source. The macro variable CPTABLE can be useful here because it enables you to determine the variables that can be used to map resources back to their consumer. For example, "SMF type 30" data on z/OS can contain information about TSO usage. CPU resources consumed can be matched to the consumer by means of a TSO logon id. However, in a network file, you need to map a terminal identifier back to the consumer by means of a user-defined lookup table. If you have user-defined lookup tables or formats, refer to the sample process and reduce jobs in the Operation section. (See "Update the Process and Reduce Tasks" on page 69.)

Default:

The default routine contains comments only.

Location:

Select **Site Administration ► Manage Customer IDs and Profiles ► Customer Identification Routine**

Activation:

Customer Name Key assignments are made by using SAS code. Assignments can differ based on the SAS IT Resource Management table data that is being used as input. You can test a macro variable called CPTABLE to determine the SAS IT Resource Management table name. By default, the routine contains only comments. Within the comments is a sample routine. You can enter any valid SAS code that can be placed within a DATA step. Cut and paste functions are available while editing the routine.

Define the Identification Routine

- 1 Select **Customer Identification Routine** from the Manage Customer IDs and Profiles task list. An Identification Routine Edit window appears:

```

Customer Identification Routine Edit
00008 /*
00009 /* You may also set the value of the SUSPEND variable to 0
00010 /* or 1 in this routine. If you set it to 1 then the
00011 /* current observation will be put in the suspend file. If
00012 /* the SUSPEND variable is set to 0 then the record will be
00013 /* processed normally.
00014 /*
00015 /* The charge summarization variables have different names
00016 /* depending on where the variables are referenced.
00017 /* Location Name
00018 /* -----
00019 /* Administration Panels Key1-Key9
00020 /* Charge Modification Exits E_CUST1-E_CUST9
00021 /* Consolidation File and
00022 /* Report Programs E0CUST1-E0CUST9
00023 /*
00024 /* Since the logic will vary with each SAS/ITSV file being
00025 /* coded, the value of the ITSV variable CPTABLE must be
00026 /* tested prior to applying identification logic. Note that
00027 /* the value being tested is converted to upper case.
00028 /*
00029 /* Example:
00030 /* %IF &CPTABLE EQ %UPCASE(XJOBS) %THEN %DO;
00031 /* E_CUST1 = PUT(SUBSTR(JOB,1,2),%CMPFMT.);
00032 /* E_CUST2 = PUT(SUBSTR(JOB,1,2),%DIVFMT.);
00033 /* E_AUDID = 'JOB=' ||JOB ||' '||
00034 /* 'JESNUM=' ||JESNMNR ;
00035 /* SUSPEND=0;
00036 /* %END;
00037 /* %ELSE %IF &CPTABLE EQ %UPCASE(XDASD) %THEN %DO;
00038 /* E_CUST1 = PUT(SUBSTR(DSNHLQ,1,2),%CMPFMT.);
00039 /* E_CUST2 = PUT(SUBSTR(DSNHLQ,1,2),%DIVFMT.);
00040 /* E_AUDID = 'HLQ=' ||DSNHLQ ||' '||
00041 /* 'VOLSER=' ||VOLSER ;
00042 /* SUSPEND=0;
00043 /* %END;
00044 /* %ELSE %DO;
00045 /* E_CUST1 = 'UNASSIGNED';
00046 /* E_CUST2 = 'UNASSIGNED';

```

Note: The SAS Notepad screen is displayed. All Preview Edit window functions and commands are available. △

- 2 Edit the identification routine. Add code here to assign values to the Customer Name Key variables from the data in the SAS IT Resource Management tables. If Suspend Processing is to be used, code the criteria for setting the value of the EC_SUSP variable.
- 3 When you close the Identification Routine Edit window, the changes you made to the routine are saved.

Data Suspend Processing

Suspend Processing is optional. The default is that Suspend Processing is turned off.

The *resource use identification logic* can assign appropriate values to the customer keys based only on known data values in SAS IT Resource Management.

In many customer sites, the information that is used to assign values to the customer keys is somewhat dynamic. This makes it highly probable that some

customer keys cannot be correctly assigned. Thus, Data Suspend Processing makes it possible for these unassigned values to be reviewed and correctly assigned.

The suspend mechanism sets the variable EC_SUSP to zero immediately prior to the macro call for E_IDRTE (identification routine). Immediately following the identification routine and prior to entering the rate model test, a check is made for EC_SUSP not equal to zero. If EC_SUSP is not zero, the current SAS IT Resource Management observation is written to the suspend file. The observation includes the additional field ECS_DSUS (date of suspension). This field is automatically populated by SAS IT Charge Management. If an observation is written to the suspend file, it is not written to the SAS IT Charge Management revenue tables.

When the process and reduce job is run, data that goes into the suspend file is placed into special tables. Tables that are parallel to all SAS IT Resource Management tables being charged for are created. These tables are in the ECSUSP library with the same name as the SAS IT Resource Management table. They contain all of the same variables as the SAS IT Resource Management table with the addition of two new variables: SU_INFO and SU_DSUS. The variable SU_DSUS is the date the data went into the suspend file. The variable SU_INFO is an audit character field. This field can be populated in the identification routine. SAS IT Charge Management standard reporting does not currently use it. The field exists for ad hoc reporting and auditing purposes only. It defaults to a null value.

Currently, SAS IT Charge Management does not delete observations from the suspend file that do not have matching criteria. The suspend file can become very large and require cleaning. If suspend processing is turned on but %ECPROCES is not run (after updating the identification routine), all the data remains in the tables in the suspend file. Cleaning must be performed manually outside of SAS IT Charge Management by means of a SAS session or batch job. SAS IT Charge Management reports on suspend data by date. Data Suspend Processing writes reports in the process and reduce job SASLOG. Samples of these reports can be found in the examples of Suspend Reports located in “Daily SAS IT Charge Management Administrator Tasks” on page 77. A macro is provided to reprocess the suspended data into SAS IT Charge Management. The macro is called ECPROCES. This macro is used in place of a job or script.

```
Example (z/OS)
*----- Sample ECPROCES Job for z/OS -----;
* This job reprocesses suspended data so that it can be ;
* added to the chargeback tables. ;
OPTIONS SASAUTOS=( ' SASCPE.MXG.V1409.USERID.SOURCLIB'
                   ' SASCPE.MXG.V1409.SOURCLIB'
                   USRSRCE
                   SASAUTOS )
          MAUTOSOURCE NOIMPLMAC ERRORABEND DQUOTE;
%INCLUDE ECSCNTL(ECSTART);
%CPSTART(MODE=BATCH,SYSTEM=z/OS,
         ROOT=SAS.R6V09.CPE,
         PDB=SASCPE.PDBSMF.,
         DISP=OLD,
         MXGLIB=SASCPE.MXG.V1409.LIBRARY,
         SITELIB=SASCPE.SITELIB,
         SITEACC=SHR,
         MXGSRCE=( ' SASCPE.MXG.V1409.USERID.SOURCLIB'
                   ' SASCPE.MXG.V1409.SOURCLIB' ));
```

```
%ECSTART(SITEPFX=SASCPE,
          PDBPFX=SASCPE.PDBSMF,
          PROCESS=SUSPEND);
%ECSPROC;          * Suspend data reprocessing;
%CMPROCES(,EXITSRC=ECSITE.ECEXIT2,
          COLLECTR=GENERIC,
          TOOLNM=SASDS,
          GENLIB=ECWORK);
%CPREDUCE( );
```

Data Suspend Administration

During each process task (%C_xPROCES), data that meets the suspend criteria is placed in a separate file. The list below explains how to administer the suspended data.

- 1 Update the identification routine to activate Data Suspend Processing. The *resource use identification logic* can indicate to SAS IT Charge Management that a particular observation that was input from SAS IT Resource Management must be "suspended" for later processing. This can be accomplished by using criteria to set EC_SUSP=1 (or some other nonzero value) when customer keys are not assigned correctly.
- 2 Run the SAS IT Resource Management process and reduce tasks (%C_xPROCES and %CPREDUCE). Verify that the job finished without errors.
- 3 Review the suspend reports. If they indicate that 0 records were suspended, no further action is required.
- 4 Review the suspend tables. View the tables in the ECSUSP library. (You can use SAS procedures or other tools of your choice to view these tables.) Look at the variables that were used to assign the customer key name structure. Compare these values to formats and other criteria specified in the identification routine.
- 5 Find out who the data should be assigned to. This can mean consulting with another person or group to determine the proper assignment.
- 6 Update the identification logic (or SAS format) used in the identification routine to recognize the new information so that it can appropriately assign values to the customer keys. Launch SAS IT Charge Management and then select **Site Administration ► Customer Information ► Edit the Identification Routine**. Make the appropriate changes and select .
- 7 Run %ECPROCES. This is a SAS IT Charge Management macro that reprocesses the suspended data and enables the identification logic to correctly assign values to the customer keys.
- 8 Steps 3 through 7 can be repeated as needed until the suspend reports show 0 records suspended.

Customer Profile Information

A customer profile lists billing attributes for a given customer.

Select **Site Administration ► Manage Customer IDs and Profiles ► Customer Profile Information ► Customer Invoice Profile Entry**

The following functions are discussed below:

- 1 Edit an Existing Customer Invoice Profile
- 2 Create a New Customer Invoice Profile
- 3 Assign a Customer Profile Key
- 4 Edit a Budget.

Edit an Existing Customer Invoice Profile

To edit an existing customer invoice profile, complete the following steps:

- 1 Select **Manage Customer IDs and Profiles ► Customer Profile Information**A list of existing profiles is presented.
- 2 Select the customer whose profile you want to change.
- 3 Click **Edit** to open the Invoice Profile Entry window for the selected customer.
- 4 Modify the customer information as desired.
- 5 Select **OK** to accept the changes, or **Cancel** to return to the previous settings. The customer profile is updated and you return to the Select Invoice Profile.

Create a New Customer Invoice Profile

To create a customer invoice profile, complete the following steps:

- 1 Select **Manage Customer IDs and Profiles ► Customer Profile Information**The Invoice Profile Selection window opens which lists existing profiles.

Note: If there are no existing profiles, SAS IT Charge Management opens an empty Customer Invoice Profile Entry window immediately. You do not have to click **New** as in the following step. △

- 2 Click **New** to open an empty Customer Invoice Profile Entry window.
- 3 Enter the customer information: Profile Name, Contact Name, Email Address, Phone Number, Fax Information, Address, Currency, Invoice Format, and Charge Item Group. At this point, you can:

assign customer profile keys by clicking **Assign Keys** and create or edit the budget by clicking **Edit Budget**.

Click **OK** or **Cancel** to return to the Customer Invoice Profile Entry window.

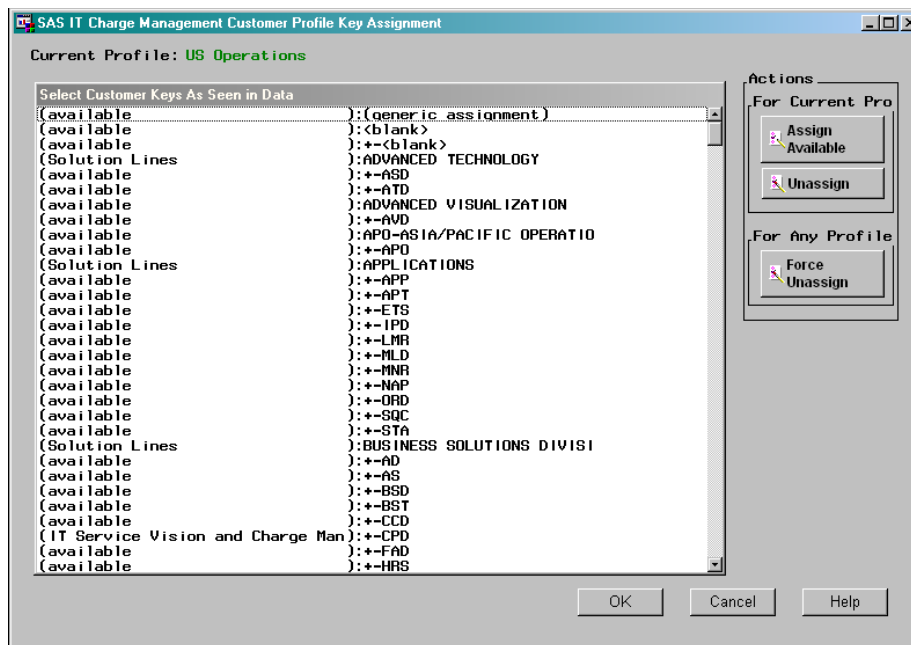
- 4 Then, click **OK** to accept the changes, or **Cancel** to return to the previous settings. The new customer invoice profile is created, and you return to the Invoice Profile Selection window.

Assign a Customer Profile Key

The SAS IT Charge Management Customer Profile Key Assignment dialog assigns customer key values to a customer invoice profile. The values of the customer keys are taken from a table built during the consolidation process. [For more information about this, see “Consolidate Data” on page 80.] Thus, you must complete at least one process and reduce and a partial consolidation before you can assign customer key values to a profile. If this window does not have key values, make sure that the **Number of Keys to Use for Profile Assignment** on the Customer Name Key Structure window is not set to zero. [For more information about this, see “Customer Name Key Structures” on page 25.]

Access the Customer Profile Key Assignment window from the Site Administration tab by selecting: **Manage Customer Ids and Profiles ► Customer Profile**

Information Select a profile that you want to work with and click on **Edit**. You can also click on **New** to create a new profile. The SAS IT Charge Management Customer Invoice Profile Entry window opens. Click **Assign Keys** to open:



The top of the window shows the name of the Current Profile that is being used for assigning keys. The current profile is the profile that you selected for Edit on the prior window. A scrollable area displays a list of customer profile keys found in the consolidated data. The left side of the area shows profiles currently assigned the key value or the word "available", which indicates that the key value has not yet been assigned to a profile. The right side of the area shows the key values in a hierarchical

form. Customer Key 1 is represented by values that begin immediately after the "):" while Customer Key 2 values are represented by values that begin after the string "):+-" and so on. The number of Customer Key levels displayed here is determined by the number specified in the box labeled **Number of Keys to Use for Profile Assignment** in "Customer Name Key Structures" on page 25.

The right side of the window displays three actions items: **Assign Available** and **Unassign** (both of which apply to the current profile), and **Force Unassign** which can apply to any profile. Click to select one or more key values in the window. Selected values are highlighted.

Note: To select multiple key values that are not listed sequentially, hold down the **Ctrl** key and click on the values you want to use. To select keys that are in a contiguous group, hold down the **Shift** key and click the first and last key values of that group. △

□ *Assign Available*

If you click on **Assign Available** without selecting at least one key value, nothing happens. If you use the **Shift** key to select a group where one or more key values are already assigned to another profile, those key values will retain the already-assigned profile. They will not be changed to the new profile.

To force these key values to be changed, select the value and click on **Force Unassign**. The key values will change from the existing (non-current) profile to **available**.

□ *Unassign*

The **Unassign** button enables you to change any key value from the current profile value to **available**. You can select multiple profiles and click **unassign**. If there are key values that are assigned to a profile other than the current profile, they will not be unassigned. These key values will keep the existing profile assignment.

□ *Force Unassign*

When you click **Force Unassign**, SAS IT Charge Management forces the highlighted key value to be unassigned from the profile, whether or not it is the current profile. The profile changes from its current value to **available**. If you select a block of key values before you click this button, all selected key values will have a profile key value of **available**.

Note: Changes made in this window are not saved until you click **OK** on the Invoice Profile Selection window. This causes the table **EC_PR** in the library **ECSITEH** (on the server) to be saved. △

Edit a Budget

To create a new budget or edit an existing budget, select **Edit Budget** on the Invoice Profile Entry window.

Profile: US Operations ☐ Show active items

Budget for Year: 2003

USD - United States of America, US Dollars

001001	Total page-ins	XCITRAN	0
001002	Elapsed UOR cpu time for thread	XCITRAN	0
001003	Database i/o-s	XCITRAN	0
001004	Dedb calls	XCITRAN	0
001005	Dedb read operations	XCITRAN	0
001006	Data base deletes issued	XCITRAN	0
001007	Data base inserts issued	XCITRAN	0
001008	Data base replaces issued	XCITRAN	0
001009	Database i/o duration	XCITRAN	0
001010	Total dl/i calls	XCITRAN	0
001011	Task cpu tcb count	XCITRAN	0
001012	Task cpu tcb time	XCITRAN	0

OK Cancel Help

In each profile, there is one budget amount per charge item and currency. All budget amounts are annual amounts. Use the arrows to increment (or decrement) the year. Budgets for current and future years are specified by means of the slider. Data entry is manual only. Budget amounts appearing on invoices are year-to-date, with variances reported against the year-to-date amounts. The way to tell SAS IT Charge Management that a budget is not specified is to use a zero amount. The budget data is kept in a separate table. Budget data is never permanently combined with consolidation data. The files are combined temporarily for the generation of invoices only. Keeping budget information is an optional feature of SAS IT Charge Management.

Before budget information is specified, the Accounting Calendar and the Invoice schedule must be specified. The **Show Active Items** check box subsets the list of charge items to those actively being charged for at this site. For the **Show Active Items** check box to display the active charge items, you must select a PDB and that PDB must have active charge items.

Note: Only the active charge items for the PDB are displayed. The active charge items for the entire site, that is, for all PDBs, are not displayed. △

For more information on these topics, see “PDB Selection” on page 55 and “Activate Chargeback - Charge Items” on page 57.

Manage Charge Item Definitions

The third menu button on the Site Administration tab displays the **Manage Charge Item Definitions** tasks which enable you to update **Charge Item Properties** and define **Charge Item Groups**.

The Charge Item Table contains the SAS IT Resource Management table name, SAS IT Resource Management variable name, variable description, and default charge rate. The table has a unique charge item identifier for each resource or service used for billing.

SAS IT Resource Management warehouses the data that it processes from various sources that monitor, among other things, the workloads that take place on computer systems. Many different kinds of activities are measured by the monitors that collect data and input the data to SAS IT Resource Management, like batch, CICS, IMS, DB2, UNIX accounting data, storage and so on. The data is stored in the SAS IT Resource Management warehouse in conveniently sized packages called tables. Each SAS IT Resource Management table contains measurements (or metrics) about the activity, and many tables record the identification of the people or groups that submitted the workload to the computer.

SAS IT Resource Management defines most of these data tables in a central location. Then, operationally convenient groups of tables are allocated to be placed in the same physical segments of the warehouse. These sets of tables are called PDBs (performance databases), and the sum of all the PDBs is the SAS IT Resource Management warehouse.

SAS IT Charge Management defines in a central location the set of all metrics in SAS IT Resource Management tables for which it will permit charges to be accumulated. SAS IT Charge Management calls each of these chargeable metric definitions a *charge item*. In order to charge for a metric (or a function of one or more metrics) in a SAS IT Resource Management table, you have to define a charge item in the SAS IT Charge Management Site Administration tab.

To produce charges for the metrics you've defined as charge items, the tables containing the metrics must be installed in a SAS IT Resource Management PDB. To begin charging, the IT Charge Management administrator accesses IT Charge Management PDBs, selects a PDB from the set of all PDBs that have been defined to SAS IT Resource Management, and opens the Site Charge Item Definitions window. All the charge items defined as having a source in the tables in the selected IT Resource Management PDB are listed. The SAS IT Charge Management administrator selects which items to charge for, and how much to charge per engineering unit of the metric (per CPU second, per 1000 i/o operations, per track of storage, and the like).

Rate Models The rates applied to these metrics can change over time. The rates for a common time period might vary according to the time of day, day of week, the processor on which the work was done, or the user who requested the work to be done. For that reason, SAS IT Charge Management enables rates to be applied by groups of specifications called rate models. This is analogous to a hotel offering different rates for rooms rented in different seasons, rates by the week, or giving different rates to the general public, to groups like AARP, AAA, or to the hotel's frequent visitor program.

Shift Differentials: SAS IT Charge Management enables shift differential charges or discounts to be applied to selected charge item rates, so that rates might be varied by time of day and by day of the week (according to the definitions of shift made to SAS IT Resource Management). SAS IT Charge Management enables processor differential charges or discounts to be applied according to which machine (for example, the batch data MACHINE identifier) of a pool of processors of varying speed executed the work. Finally, SAS IT Charge Management enables entire rate models to be defined such that different rates might be charged for different groups of users, and the schedules of those rates might advance on different dates.

Example 1

If there is no definition of a particular metric as a charge item, the SAS IT Charge Management administrator must:

- 1 Add the table to a SAS IT Resource Management PDB.
- 2 Add the charge items for those metrics as a definition by means of the SAS IT Charge Management Site Administration charge item edit function.

- 3 Click **PDB Selection** to select the SAS IT Resource Management PDB in which the table is installed. Click the **Manage PDBs** tab and select **Charge Items** from the sub-window on the right.
- 4 Check the **Act** box to activate the new charge item.
- 5 Fill in a rate for which to charge.
- 6 Repeat 4-5 as many times as necessary if there are multiple charge items.
- 7 Run the database definition utility job.

Example 2

If the charge item is already defined to the site, do items 1 and 3-7 of Example 1.

Example 3

If a charge item is active and charged for in a SAS IT Resource Management PDB, and then the user installs another PDB with the same table and wants to produce charges for the second PDB, do items 3-7 of Example 1.

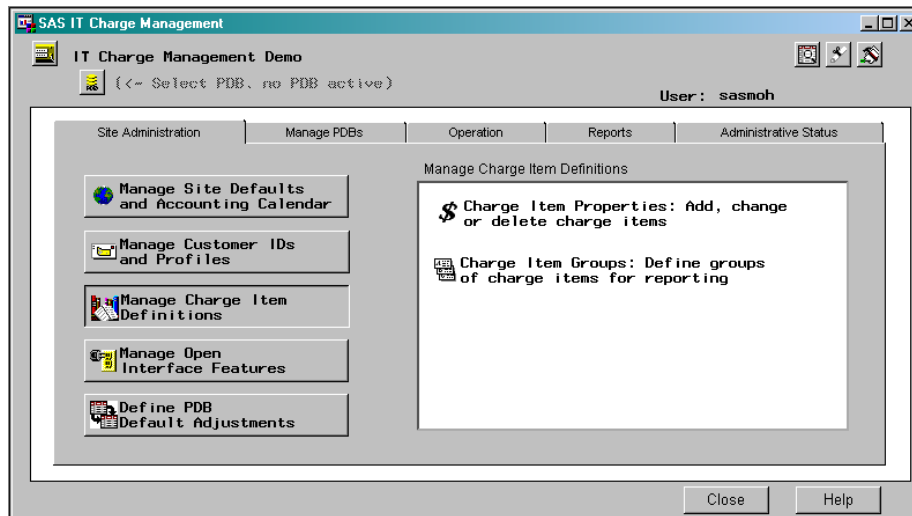
Example 4

If new rates are to take effect on a given day, the SAS IT Charge Management administrator has to:

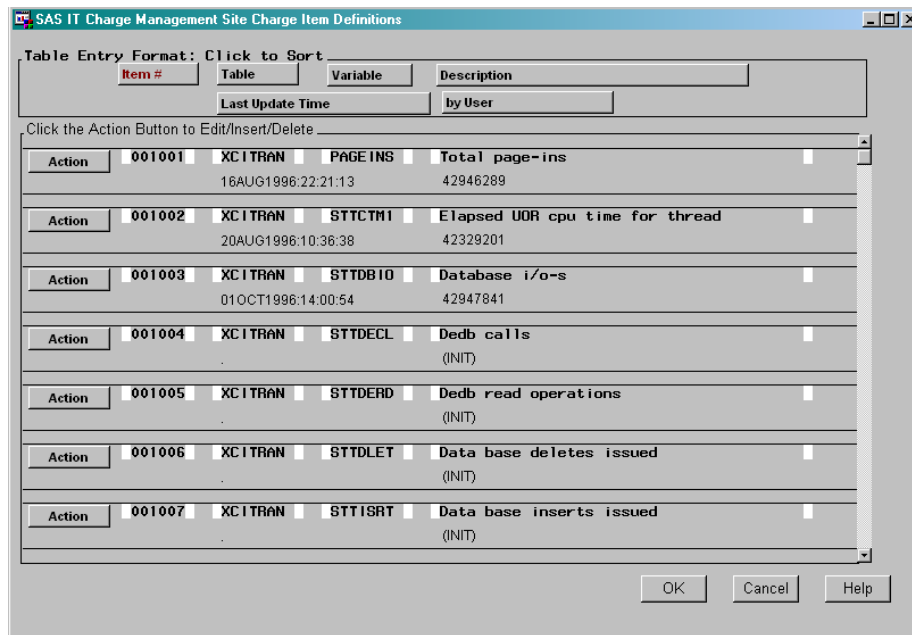
- 1 Click **PDB Selection** to select the SAS IT Resource Management PDB in which the table is installed. Click the **Manage PDBs** tab and select **Charge Items** from the sub-window on the right.
- 2 Select the rate model that you want to change, and the latest effective date of that rate model (for example, DEFAULT 25JAN1999).
- 3 Add a new rate model of the same name and a new effective date (for example, DEFAULT 25APR1999).
- 4 Select additional charge items to be active as necessary, or select the charge items whose status or rate changes.
- 5 Fill in the new rates that you want to charge.
- 6 Repeat steps as many times as necessary if there are multiple rate models or charge items.

Charge Item Properties

Select **Site Administration ► Manage Charge Item Definitions**



Select the **Charge Item Properties** task action item to display:



From the Site Charge Item Definitions window, you can perform these functions:

- 1 edit a charge item
- 2 modify the computation for a computed charge item (a variable whose name is preceded by a C_ or an X_)
- 3 delete an entry
- 4 clone an entry (non-computed items only)
- 5 insert a new entry.

Descriptions of these functions follow the Table of Charge Item Entries.

Charge Item Definition Table

Charge Item Definition table entries contain the following fields:

Table 4.3 Charge Item Definition Table Entries

Field	Description
Item #	Unique numeric identifier called: Charge Item
Table	SAS IT Resource Management Table this Charge Item is derived from
Variable	SAS IT Resource Management or user-defined variable name
Description	SAS IT Resource Management or user-defined variable description
Last update	Date of last update to this Charge Item definition
By user	Name of user who performed the last update

Note: Charge items whose names start with **c_** are calculated in the normal course of processing charges. **x_** elements are calculated in the same way, but only after *all* other data elements, including **c_s** have been assigned or calculated, and the totals for all charges are available to the **x_** charge items. Because of the way **x_** charge items are processed, they can be used to calculate maximum charges, minimum charges, or volume discounts. △

Edit a Charge Item Definition

You can change the definition of any user-defined charge item. A charge item whose definition is supplied by SAS IT Charge Management cannot be changed. However, you can make a copy of a supplied charge item, then edit the copy.

- 1 From the Site Charge Item Definitions window, click the action button of the charge item you want to edit. A pull-down menu of operations appears.
- 2 Select **Edit This Entry**. The fields that you can edit are highlighted.
- 3 Edit the fields as desired.
- 4 Click **OK** to accept the changes or **Cancel** to return to the previous definition. The Charge Item table is updated.

Delete a Charge Item Definition

- 1 From the Site Charge Item Definitions window, click the action button of the charge item you want to delete. A pull-down menu of operations appears.
- 2 Select **Delete This Entry**. If the item is user defined, the item is immediately deleted from the Charge Item table.

Copy a Charge Item

If you want to change calculations for supplied calculated charge items, you must first copy the charge item to make a charge item with a different Charge Item Number, and then overwrite the calculations that were supplied.

- 1 From the Site Charge Item Definitions window, click the action button of the charge item that you want to copy. A pull-down menu of operations appears.
- 2 Select **Clone This Entry** from the pull-down menu. A duplicate of the entry appears. The fields you can edit are highlighted.

Note: A Charge Item Number will be assigned. You can change the Charge Item Number as long as the new number is unique. △

- 3 Edit the fields as desired and click **Enter**.
- 4 Select **OK** to save the changes. The Charge Item table is updated.

Modify the Computation Routine

Sometimes there are charge items for which your site has particular calculations. An example is to charge per 60 lines of print or per 100 pages of print. These calculations require altering the Computation Routine. Variables whose names are preceded by a C_ or an X_ are computed.

For computed charge items, you must specify code that puts a value in the quantity variable. We recommend that code entered into SAS IT Charge Management for computed charge items or for any routine be kept to a minimum. Code can be entered into SAS IT Charge Management by means of macro invocations or %INCLUDE statements which will access code from other locations on the host (server) system. By using a %INCLUDE, you can enter and maintain such code using tools you are familiar with. The code that is to be included using %INCLUDE statements or the autocall macro definition can be placed on the server. If the server is z/OS, place the code in **siteprefix.EC.AUTOS** for z/OS. If the server is on UNIX or Windows, place it in **!sasroot/chm/EC/AUTOS** or **SAS\CPE\chm\ec\autos**, respectively.

- 1 From the Site Charge Item Definitions window, select the action button of the computed charge item whose Computation Routine you want to change. A pull-down menu of operations appears.
- 2 Select **Edit Computation**. A **Computation Routine** panel appears.

Note: The **Edit Computation** selection is available only when the selected charge item is a computed charge item, that is, it begins with C_ or X_. △

- 3 Edit the Computation Routine.
- 4 Select ☐ (close window) in the upper-right corner to close the window. The Computation Routine for the selected Charge Item is updated.

Insert a New Charge Item Definition

Although SAS IT Charge Management provides many supplied charge item definitions, there can be an occasion when the charge item that you require is not supplied. Additional charge items can be added to SAS IT Charge Management using any variable (or by using a formula based on any variable) that is available in the SAS IT Resource Management table.

Additionally charge items can be defined for use with the SAS IT Charge Management Import feature and for use with Supplemental Charges feature, which enables the addition of debits and credits. In both of these cases, use a meaningful table name and variable name for your charge item.

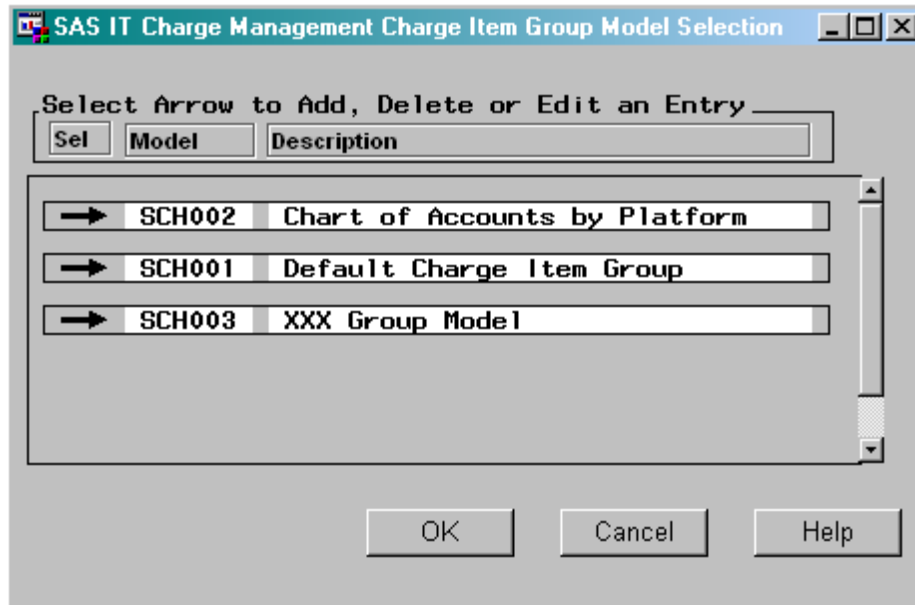
When you add charge items, they are automatically assigned Charge Item Numbers beginning at 500,000. Each item that you add will have a number incremented from this number. If you delete user-defined charge items, the Charge Item Number is not reused.

You can change the Charge Item Number to any combination of six characters, numbers, or national characters, except for the following: &, %, ', and ". Leading and trailing blanks are preserved.

- 1 From the Site Charge Item Definitions window, click any action button. A pull-down menu of operations appears.
- 2 From the pull-down menu, select **Insert A New Entry**. A blank charge item entry appears. The fields that you can enter are highlighted.
- 3 Fill in the fields as desired. If you specify a variable name with a prefix of C_ or X_, you also need to enter the Computation Routine.
- 4 Click the ☐ (close window) in the upper-right hand corner to close the window. The Charge Item table is updated.

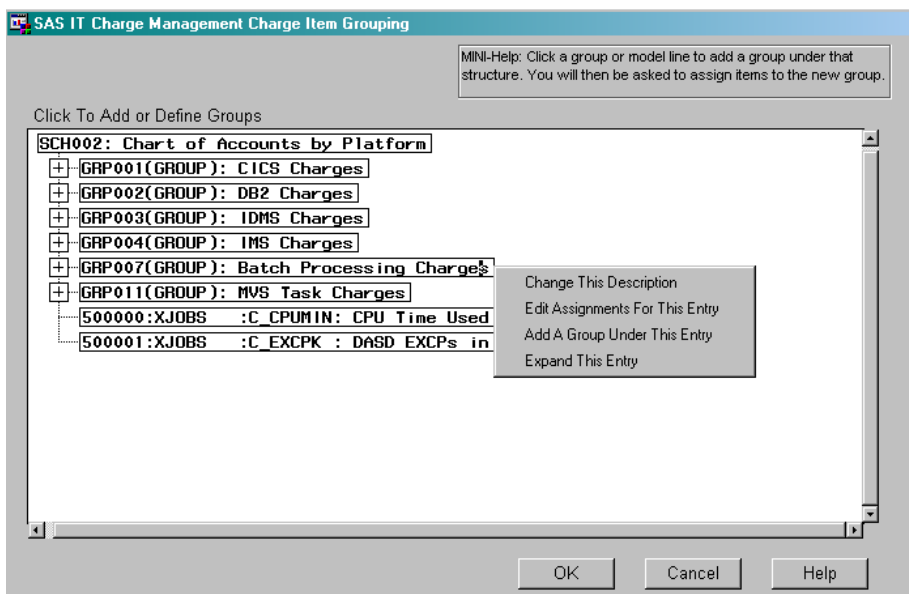
Charge Item Groups

Charge Item Groups enable you to add a hierarchical layer to the charge items for rate model qualification and reporting. Usually groups are defined for functional areas such as Network, TSO, or Storage. They can also be used to define a group of all the charge items that constitute a unit of work.



When you select an entry on the Charge Item Group Model Selection window, a pop-up menu opens that enables you to add a new entry or edit or delete an existing entry. If you select **Insert a New Entry** and enter the description of the new group model, the Charge Item Grouping window opens.

Note: By clicking on the group, you can choose any item from the pull-down menu in order to edit the entry. △



Open Interface

SAS IT Charge Management has an open architecture. Data can be imported or exported, existing SAS formats can be used, or new user-defined SAS formats can be created. ODBC compliance ensures an easy import from or export to all other ODBC compliant applications, such as Microsoft Excel.

The [Manage Open Interface Features](#) button on the Site Administration tab of the SAS IT Charge Management GUI has three action items. They are:

- 1 Debits and Credits
- 2 Import/Export
- 3 AccountView Data Extract.

The following sections discuss each of these action items.

Debits and Credits

Description:

Debits and Credits provide the facility to make adjustments to your existing charges, add one time discounts or surcharges, and supply data entry charges. If you have recurring charges that require more than five to ten entries, consider using the SAS IT Resource Management Generic Collector facility to create a table to be used with SAS IT Charge Management.

Each Debit and Credit must be associated with a Charge Item Number. If the supplied Charge Item Definitions are not sufficient to cover your Debits and Credits, add new charge item definitions under Site Administration. In the consolidation file, you can tell which charges were added as Debits and Credits by testing the E0TYPE field. This facility is for manual data entry only. It is not intended for recurring adjustments.

Note: For a list of variables that can be used with Debits and Credits, see “Variables in EC_SC (Debit and Credit File)” on page 119. △

Default:

No debits or credits are defined.

Location:

You can access Debits and Credits by selecting the Site Administration tab from the SAS IT Charge Management main menu, and selecting [Manage Open Interface Features](#). The first feature on the right is Debits and Credits.

Activation:

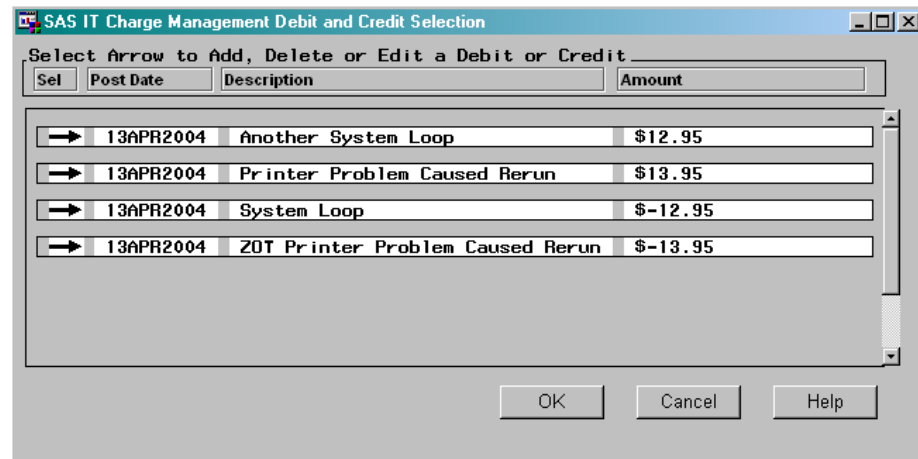
- 1 Access the Debits and Credits Entry window as described immediately above, in Location to open:

- 2 In this window, you can specify the following items: whether this will be a debit or credit, a description and Charge Item Number for the debit or credit, the amount (do not specify a negative amount), the currency (it will default to the common currency selection), a date to which this debit or credit should be posted, and the customers to whom this debit or credit applies.

Note: If you select credit, the amount you enter will automatically be made negative by SAS IT Charge Management. You can see this on the Debit and Credit selection window. An example of this window is included in Item 7 of this list. △

- 3 If you are unsure of the Customer Name Key values, select **Fill Keys**. The Fill Keys function is available only after at least one process and reduce job and one consolidation job have successfully completed. The Customer Key Selection window opens which displays an interactive expandable and collapsible listing of all known **Customer Name Key** values:

- 4 Selecting any entry in this window causes a pull-down list to appear. The list enables you to select the entry, expand or collapse the selection, or examine another key. Right click on a value to select it. After you select a key value, you return to the Debit and Credit Entry window.
- 5 When you are satisfied with your entries, select **OK** to save your changes. Alternatively, you can select **Cancel** to remove your changes.
- 6 The debits and credits for the invoice period are automatically combined with all other SAS IT Charge Management data when the consolidation job runs.
- 7 After adding debits and credits and leaving the data entry window, return visits to the Debits and Credits window show another summary window. The summary window lists all of the debits and credits. For each debit or credit, the summary window lists the date posted, description, and amount:



- 8 From this window, you can select an entry to copy, edit, or delete, or you can insert a new entry. Inserting a new entry takes you to the Debit and Credit Entry window (shown above). After you are satisfied with your changes, select **OK** to save your work. If you do not want to save your changes, select **Cancel**.

Import/Export

Import Data Definitions

Description:

This is an exit at which you can use the SAS System to import additional data such as profile information. Any valid SAS code can be specified here. You can code a data import exit or deactivate an existing data import exit.

Specifying an exit will activate the creation of a utility batch job or script. You must submit the batch job or script for execution or add it to your scheduling package.

Default:

No exits are specified.

Location:

From the SAS IT Charge Management main menu, select **Site Administration ► Manage Open Interface Features ► Import/Export Definitions**

Activation:

- 1 Select **Import/Export Definitions** as described above, in Location.
- 2 Select **Code a Data Import Exit** from the pull-down list.
- 3 The SAS Notepad screen is displayed. Enter your SAS code to import your data.
- 4 When you are finished, select Save Changes from the pull-down menu to save your updates.

See also “Invoice Period End Processing” on page 79.

Import Template

Purpose

The purpose of this template is to help you code a data import routine for SAS IT Charge Management. Most data is processed into SAS IT Charge Management from SAS IT Resource Management. Occasionally, there is a need to process data into SAS IT Charge Management on an infrequent basis or in very small quantities. In these situations it might not be practical to load this data into the SAS IT Resource Management data warehouse. In order to accommodate this need, SAS IT Charge Management offers two features: data import (see “Import/Export” on page 42 and “Import Data” on page 80) and supplemental charges (see “Debits and Credits” on page 40).

Both features add observations in the server SAS IT Charge Management library ECDATAH. When z/OS is the server, this library is siteprefix.EC.DATA. On UNIX, this library is /cperoot!/ec/data. On Windows NT, this library is c:\sas\cpepathprefix\ec\data. In the ECDATAH library, the table, EC_SC, is used. Supplemental charges are added manually through the SAS IT Charge Management Client. When there is too much data to enter manually, the import feature can be used in batch to load the data.

The import routine adds observations to the EC_SC table. The import routine reads the input file, creates observations for EC_SC containing the variables listed below, and populates those variables using the data in the input file as well as any necessary logic. For a list of variables in the EC_SC table, see “Variables in EC_SC (Debit and Credit File)” on page 119.

- DEBUG=Y or DEBUG=YES is available on the invocation of macro ECSTART to turn on source for debugging.
- SAS formats in ECSITEH.ECUSER are available.
- Entries are made in Detail Status at the start and end of the Import process.
- Old observations must be removed manually.
- Summarization occurs in the consolidation file. The EC_SC data set is not summarized.
- Currency and Charge Item Numbers are not validated. If the Charge Item Number is not defined in Site Charge Item Definitions, it will not have a description associated with it. Nor can it be assigned to charge item groups.
- ECTYPE variable (charge type) is set to 0500 for imported data.
- Calculations for computed charge items are available as macros named according to the following convention: The macros can be named %CXnnnnnnn, where nnnnnn is the 6-character name of the charge item. This formerly was restricted to 6-digit numbers in the range of 500000-599999, but now can be any alphanumeric.
- Consolidation takes input from all "ready" status PDBs and EC_SC to build the consolidation file. The consolidation file is summarized but import data will have

ECTYPE=0500 and the ECTYPE variable is part of the summarization sequence. Thus, summarized imported data can be viewed in the consolidation file.

- Because quantity times rate equals charge, and rate is part of the key structure of the consolidation files, supplemental charge and imported data should set rate to 1 and should set quantity to the charge in the appropriate currency. This will enable mass-loaded data to summarize. If you set quantity to 1 and vary rate, you get only slight benefit of summarization if you have large numbers of different charges.
- The import template includes a PROC SORT with the NODUP option. This procedure step is recommended to guard against the accidental inclusion of the same data multiple times.

Steps to implement an Import routine:

- 1 Review your raw data.
- 2 Determine which of the above variables can be directly assigned and which need to be derived.
- 3 Determine charge items.
- 4 Update Charge Item Definitions in the GUI. Update this section for import feature.
- 5 Make a copy of the import template.
- 6 Update the parameters for the ECSTART macro call. Use IMPORT for the process parameter and leave the PDBPREFIX parameter as a null value.
- 7 Code the data input section to read the raw data file.
- 8 Assign values to all variables in the EC_SC table.
- 9 Generate the import job.
- 10 Ensure that you have a good current backup of SAS IT Charge Management site data library. This library is called **[siteprefix].EC.DATA** on the z/OS server. The library is called **cperoot!\EC\DATA** on the Windows server and **cperoot!/\EC/DATA** on the UNIX server.
- 11 Run the import job.
- 12 Review the log for errors and review the output of the frequency procedures.
- 13 Review the contents of EC_SC. If the contents do not contain what you expect, modify the import code and repeat steps 11 and 12.
- 14 Once you are satisfied with the results, move the generated import job to your production scheduler so that it executes before the consolidation job.

Example

The IS department is providing service to verify a department's Y2K compliance. This is single occurrence billing. Time sheet data is kept in simple SAS data set. The SAS IT Charge Management Administrator has defined a new charge item in the SAS IT Charge Management client. The definition is as follows:

Item	Table	Variable	Description
500005	IMPORT	RESOURC	Hours Worked

The input file looks as follows (only the first 5 observations are printed):

	Div	Depart	Datetime	Sysid	Resourc	Qty	Rate
1	Corporate	TSUP	14DEC1999:08:00	PROD	HOURS	5	50.00
2	Corporate	TSUP	14DEC1999:08:00	TEST	HOURS	8	40.00
3	Corporate	TSUP	15DEC1999:08:00	PROD	HOURS	7.5	50.00
4	Corporate	TSUP	15DEC1999:08:00	TEST	HOURS	6	40.00

5 Corporate TSUP 16DEC1999:08:30 PROD HOURS 6.5 50.00

Import Routine:

This sample import routine has ***IN DATA*** in the comments of all variables that come from the data input file. Other variables are assigned values in the import routine. The **SYSPARM** value of **AUTOINV** is used to place the data in the correct invoice period.

```

libname import 'e:\data\import';          /* input data */
filename ecscntl 'c:\itsv\itcm23\ec\scntl'; /* server control lib */
libname ecsiteh 'c:\itsv\itcm23\ec\site';   /* server site lib */
libname ecdata 'c:\itsv\itcm23\ec\data';    /* server site data */
/* Copyright 2000 SAS Institute Inc.                */
/* Function: Template for Import routine             */
/* (Puts the data into the same file as the debits and credits) */
/* Created: 08 Nov 1999                             */
/* Changes:                                          */
/* 2.30.0    00 Jan 2000    New                    */
options nodsnoerr nobyerr novnferr yearcutoff=1950 sysparm=AUTOINVC;

%include ECSCNTL(ECSTART,ECLOG,ECGBLBAT,ECCFDT);
%ecstart(SITEPFX=c:\itsv\itcm23,
          PDBPFX=,PROCESS=IMPORT,DEBUG=YES);

%global WRK_STDT WRK_2DT ecwork2;

data _null_;
  if symget('ecwork2') eq ' ' then call symput('ecwork2','work');
run;

%eclsg;
/* loads site globals */

/* set invoice date from sysparm for subsetting */
%eccfdt;

/* load data into SAS IT Charge Management work file */
DATA IMPORT (Keep=E0CURRE    E0CHRG    E0CQTY    E0CRATE    E1CHRG    E1CRATE    E2CRATE    E2CHRG    E0CITEM    E0CTYPE    E0CUST1    E0CUST2    E0CUST3    E0CUST4    E0CUST5    E0CUST6    E0CUST7    E0CUST8    E0CUST9    E0INVSD    E0MONTH    E0STRTM    E0ENDTM    E0RMDL    E0YEAR    DCEDATE    DCDESC    MACHINE    SHIFT    DATETIME    SWIT    );
  attrib e0cust1 label="%ec_s_cd1" length=$&ec_s_cn1;
  attrib e0cust2 label="%ec_s_cd2" length=$&ec_s_cn2;
  attrib e0cust3 label="%ec_s_cd3" length=$&ec_s_cn3;
  attrib e0cust4 label="%ec_s_cd4" length=$&ec_s_cn4;
  attrib e0cust5 label="%ec_s_cd5" length=$&ec_s_cn5;
  attrib e0cust6 label="%ec_s_cd6" length=$&ec_s_cn6;
  attrib e0cust7 label="%ec_s_cd7" length=$&ec_s_cn7;
  attrib e0cust8 label="%ec_s_cd8" length=$&ec_s_cn8;
  attrib e0cust9 label="%ec_s_cd9" length=$&ec_s_cn9;
  attrib e0invsd label='Start Date of Invoice Period'

```

```

                                length=8    format=date9.;
attrib e0ccurr  label='Charge Currency' length=$3;
attrib e0citem  label='Charge Item'      length=$6;
attrib e0ctype  label='Charge Type'      length=$2;
attrib e0cqty   label='Quantity'         length=8;
attrib e0cqty_s label='SUM: Quantity'     length=8;
attrib e0crate  label='Charge Rate'       length=8;
attrib e1crate  label='Modified Charge Rate' length=8;
attrib e2crate  label='Zero Balance Charge Rate' length=8;
attrib e0chrge  label='Primary Charge'    length=8;
attrib e1chrge  label='Modified Charge' length=8;
attrib e2chrge  label='Zero Bal Charge' length=8;
attrib e0month  label='Fiscal Month'      length=4    format=2.;
attrib e0year   label='Fiscal Year'       length=5    format=4.;
attrib machine  label='System id'         length=$8;
attrib shift    label='Shift'             length=$1;
attrib datetime label='Timestamp'         length=8    format=datetime19.;
attrib e0strtm  label='Start Time'        length=8    format=datetime19.;
attrib e0endtm  label='End Time'          length=8    format=datetime19.;
attrib e0rmdl   label='Rate Model'        length=$16  format=$16.;
attrib dcdesc   label='Description of Entry ' length=$32;
attrib dcedate  label='Effective Date'    length=7    format=date9.;
attrib swit     label='Switch'            length=$1;
RETAIN  SWIT      ' '
        DCEDATE    0
        DCDESC     'Import Data'
        E0CUST1-E0CUST9 ' '
        E0STRTM    0
        E0ENDTM    0
        E0MONTH    0
        E0YEAR     0
        E0INVSD    0
        E0CITEM    ' '
        E0CTYPE    ' '
        E0CCURR    ' '
        E0CRATE    0
        E0CQTY     0
        E0CQTY_S   0
        E0CHRGE    0
        E1CRATE    0
        E1CHRGE    0
        E2CRATE    0
        E2CHRGE    0
        DATETIME   0
        MACHINE    ' '
        SHIFT      ' '
        WK_DTOPT   'DEFAULT '
        WK_DOMSG   1
        E__WKINV   0
        WK_CHK     'O'
        doForce    0
;

/* bring in data using SET statement if input is a SAS dataset or using */
/* INFILE/INPUT statements if input is not a dataset that was generated by SAS.

```

```

SET import.impfile END=EOF;

/* Assignment of SAS IT Charge Management variables from input */
/* Your imported data or a derivation thereof must provide the values */

DCEDATE = today(); /* effective date for the data */
DCDESC = 'Hours for Y2K Project'; /* description of data imported */
MACHINE = systemid; /* Name of machine or cpu identifier *IN DATA***/
SHIFT = '1'; /* shift values */
DATETIME= datetime; /* date and time data was created *IN DATA***/
E0CUST1 = div; /* customer key 1 *IN DATA***/
E0CUST2 = depart; /* customer key 2 *IN DATA***/
E0CUST3 = ' '; /* customer key 3 */
E0CUST4 = ' '; /* customer key 4 */
E0CUST5 = ' '; /* customer key 5 */
E0CUST6 = ' '; /* customer key 6 */
E0CUST7 = ' '; /* customer key 7 */
E0CUST8 = ' '; /* customer key 8 */
E0CUST9 = ' '; /* customer key 9 */
E0CURRE = 'USD'; /* Currency name */
E0RMDL = 'IMPORT ' !! PUT(E0INVSD,date9.); /* Rate model */
E0CTYPE = '0500'; /* 0500 for imported data */
/* charge item must be in definition *IN DATA***/

if resourc = 'HOURS' then E0CITEM='500005';
E0CRATE = rate; /* rate to multiply against quantity*IN DATA***/
E0CQTY = quantity; /* quantity for primary charge *IN DATA***/
E0CHRG = E0CRATE*E0CQTY; /* charge calculation */
E1CRATE = E0CRATE; /* modified rate defaults to primary */
E1CQTY = E0CQTY; /* modified qty defaults to primary */
E1CHRG = E0CHRG; /* modified chrg defaults to primary*/
E2CRATE = E0CRATE; /* zero bal rate defaults to primary */
E2CQTY = E0CQTY; /* zero bal qty defaults to primary */
E2CHRG = E0CHRG; /* zero bal chrg defaults to primary*/

if _n_ = 1 then do; /* invoice date processing options */
    E__WKDT="%sysdate"d;
    E__WKINV=input(put(E__WKDT,ECINVSD5.),5.);
end;
length E__WK20 $20;
E__DATE=datepart(DATETIME);
E__WK20=put(E__DATE,ECYRMN11.);
if E__WK20 eq "G" then do;
    E0MONTH=month(E__DATE);
    E0YEAR=year(E__DATE);
    E0DAY=day(E__DATE);
end;
else if E__WK20 eq "*" then do;
    /* error */ end;
else do;
    E0YEAR=input(substr(E__WK20,1,4),4.);
    E0MONTH=input(substr(E__WK20,5,2),2.);
    E0DAY=E__DATE-input(substr(E__WK20,7,5),5.);
end;
E0INVSD=input(put(E__DATE,ECINVSD5.),5.);

```

```

if WK_DTOPT = "DEFAULT" then do;
  if E0INVSD LT E__WKINV then do;
    if WK_DOMSG then do;
      WK_DOMSG=0;
      put 50*""/
        " Data has been processed for invoice period " E0INVSD DATE9. /
        " This data has been forced into period " E__WKINV DATE9. /
        50*"";
    end;
    E0INVSD = E__WKINV;
  end;
end;
else if WK_DTOPT = "NATURAL" or WK_DTOPT = "FORCE" then do;
  WK_CHK = PUT(E0INVSD, OCFMT.);
  if WK_CHK = "C" and not doForce then do;
    E0INVSD = E__WKINV;
  end;
else do;
  if WK_DOMSG then do;
    WK_DOMSG=0;
    put 50*""/
      " Data has been forced into the invoice period " E0INVSD DATE9. /
      " You must re-run consolidation for this period." /
      50*"";
  end;
end;
end;
else do;
  ABORT ABEND 17; /* Invalid value for WK_DTOPT */
end;

/* the following code checks for a quantity - if there then */
/* write out the observation. If the rate or charge is zero the*/
/* observation is still written out. */
if E0CQTY ne 0 and E0CQTY ne . then DO;
  output import ;
  OCNT+1;
END;
ELSE DO;
  CNT+1;
  PUT '====> OBSERVATIONS WITH QUANTITY EQUAL TO 0 OR MISSING' _ALL_;
END;
IF EOF THEN PUT '====> TOTAL RECORDS USED FOR APPENDING TO EC_SC: ' OCNT=;
RUN;

%let conby = machine e0cust1 e0cust2 e0cust3 e0cust4 e0cust5
            e0cust6 e0cust7 e0cust8 e0cust9 shift
            e0citem e0rmdl e0ctype e0curr e0crate ;

proc sort data=import;
  by &conby run;

/* create a new working copy of the EC_SC file */
DATA EC_SC;

```

```

SET ECDATA.EC_SC
  IMPORT;
run;

/* sort combined file with nodup option to avoid duplicates if */
/* same data is added more than once. */
proc sort data=ec_sc nodup;
  by &conby;
run;

/* show what the file looked like before the update */
Proc freq data=ecdata.ec_sc;
  tables e0ctype*e0citem /* list missing;
  title 'Frequency of ec_sc before Import';
run;

/* show what the file looked like after the update */
Proc freq data=ec_sc;
  tables e0ctype*e0citem / list missing;
  title 'Frequency after Import Data added';
run;

/* uncomment below when happy with the code above */
Data ECDATA.ec_sc;
  set ec_sc;
  run;

%eclog(event=IMPORT: Data Import Complete,site=&ecs_spfx);

```

Export Data Definitions

Description:

This is an exit at which you can specify SAS code to export SAS IT Charge Management data to other applications such as Microsoft Excel or a general ledger package. Valid SAS code can be specified here. You can also code a data import exit or deactivate an existing data import exit.

Specifying an exit activates the creation of a utility batch job or script. You must submit the batch job or script for execution or add it to your scheduling package.

Default:

No exits are specified.

Location:

From the SAS IT Charge Management main menu, select **Site Administration ► Manage Open Interface Features ► Import/Export Definitions**

Activation:

- 1 Select **Import/Export Definitions** as described immediately above, in Location.
- 2 From the pull-down list, select **Code a Data Export Exit**.
- 3 The SAS Notepad screen is displayed. Enter your SAS code to export your data.

- 4 When you are finished, select Save Changes from the pull-down menu bar to keep your updates.

See also “Invoice Period End Processing” on page 79.

Extract Data Setup

Description:

This window enables you to create extract files to download to the client from the server to pass to AccountView. It also enables you to create extract files to download to the client from the server to pass to Enterprise Reporter. (This information applies to Enterprise Reporter for SAS 8.2 only). In this window, you can specify which variables you want to include on the AccountView extract file.

Note: If you specify only those variables that you need, you can reduce the file size. △

CAUTION:

Do not download the extract files unless the consolidation job has run successfully. △

The extract files are not created until the consolidation completes. After the job is complete, you can download the extract files from the Operations tab.

Date and currency formats used in AccountView are specified in ECLIB.ECUSER.ECXTRCT.SOURCE. This SAS IT Charge Management client source entry is used during the regeneration of the consolidation job. The source entry contains ATTRIB statements assigning formats to various variables. AccountView uses the formats assigned here. Update the formats on the ATTRIB statements to reflect your choices.

Default:

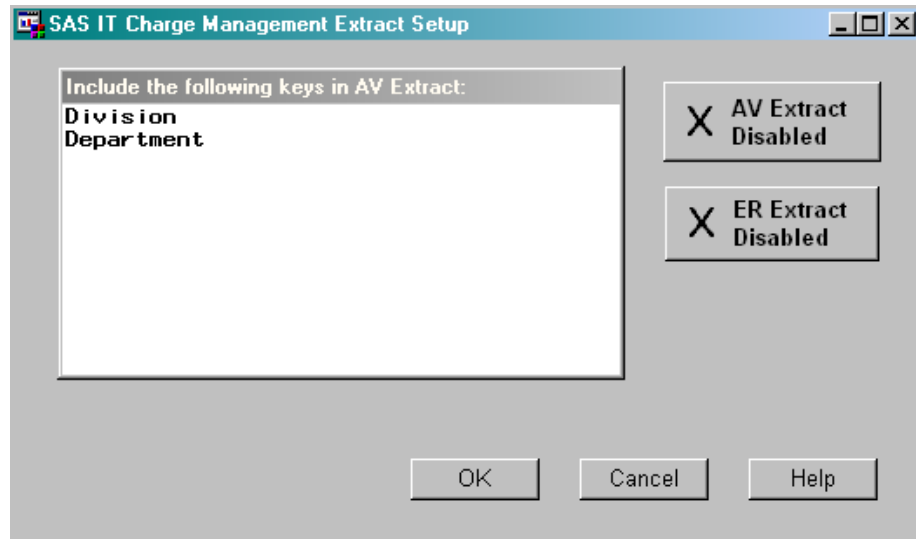
The AccountView Data Extract and the Enterprise Reporter Extract are not created.

Location:

From the SAS IT Charge Management main menu, select the Site Administration tab. Then select **Manage Open Interface Features**. Next select **Extract Data Setup**.

Activation:

- 1 Access the Extract Setup window as described immediately above, in Location.



- 2 Select the keys that you want to include in the AccountView extract file. You can select one key by clicking it. You can select multiple keys by holding down the shift or control button on your keyboard while you are selecting the keys with your mouse.
- 3 Click the button that is on the right side of the window to toggle between **Extract Enabled** and **Extract Disabled**. If you want to create the extract file, select the button so that it shows **Extract Enabled**. If you do not want to create the extract file, select the button so that it shows **Extract Disabled**.
- 4 Select **OK** to save your specifications, or **Cancel** to return to the previous specifications.

Note: For information about using AccountView for your reports, see “AccountView” on page 94. △

Define PDB Default Adjustments

Define PDB Default Adjustments is the menu button on the bottom left of the Site Administration tab. It enables you to make charge adjustments common to all PDBs in a server installation. When you select it, the task list in the sub-window on the left of the Site Administration tab lists action items that describe the types of adjustments you can make.

To adjust:

- Shift Charges, select “Common Shift Charges” on page 51.
- CPU Processor Normalization, select “Common Processor Charges” on page 54.
- Proration, select “Common Prorate Routine” on page 55.
- Device Definitions, select “Common Device Charges” on page 53.

Common Shift Charges

Description:

The Common Shift Charges action item enables you to define a shift discount or surcharge for any shift identifier defined in SAS IT Resource Management. This

kind of chargeback methodology serves to encourage or discourage the consumption of a data center resource, based upon the shift during which the resource is utilized.

To implement a charging methodology that includes shift discounts or surcharges, you can enter charging factors for any applicable shifts. The charging factor is called a *shift multiplier*.

The Common Shift Charges task enables you to define a **Multiplier** for any charges that fall in a specified time period. The multiplier can generate an additional charge or surcharge to, or an additional discount or reduction of a regular charge.

Note: If the multiplier is less than 1, then when the charge is multiplied by the multiplier, a discount is generated. For example, suppose the multiplier is 0.95 and the charge is then the value 0.95y. The resulting discount is $(1-0.95y)=0.05y$ or a 5% discount.

If the multiplier is greater than 1, then when the charge is multiplied by the multiplier, a surcharge is generated.

If the multiplier is 1, which is the default, then neither a surcharge nor a discount is generated. △

Shift charges are generated as additional observations in the detail “E” table data. All variables are the same as the original observation with the exception of a few variables: E0CTYPE, E0RATE, and E0CHRG. E0CTYPE is set to “0100”. E0RATE is the product of the original rate and the shift multiplier. E0CHRG is the product of the adjusted rate and the quantity. You can update the common shift discount and surcharge specifications from the Site Administration menu, [Define Default PDB Adjustments](#). You can update the PDB-unique shift discount and surcharge specifications from the Manage PDBs window, [Define Surcharges, Discounts and Prorating](#).

Default:

All shift multipliers are set to 1.00, so they have no effect on the charges.

Location:

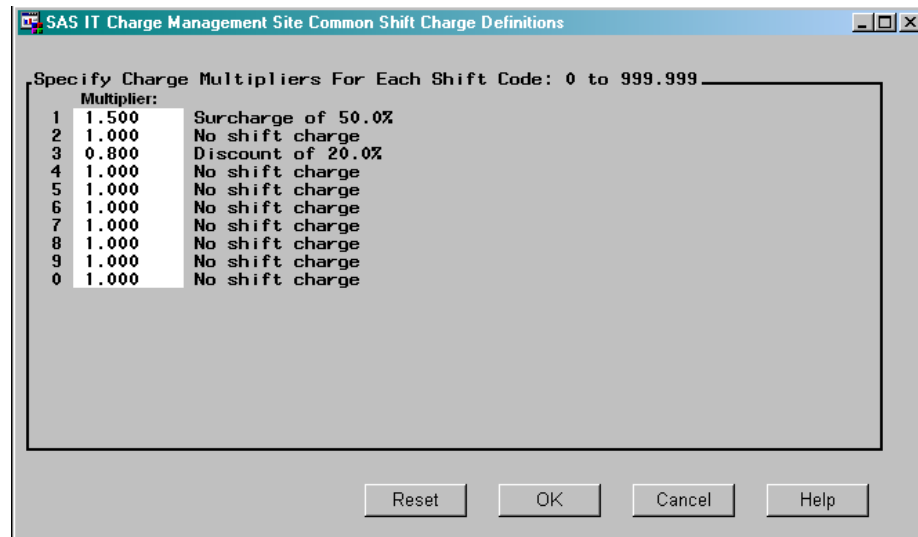
Select the Site Administration tab from the SAS IT Charge Management main menu. Select [Define Default PDB Adjustments](#). The sub-window on the right is updated. Select the **Common Shift Charges** area. The resulting window enables you to specify shift multipliers. Depending on your specifications, this button changes to [Common Shift Charges: Currently Not Defined](#) or [Common Shift Charges: Currently Defined](#).

Activation:

The Common Shift Charges task enables you to select shift charges common to all PDBs, or to indicate that you do not want shift charges. The two lists below show in detail how to activate each choice.

Common Shift Charges

- 1 Select [Define Default PDB Adjustments](#) from the Site Administration tab.
- 2 Select **Common Shift Charges**. The Site Global Shift Charge Definitions window appears:



- 3 The values are common to all PDBs, unless overridden by using the Manage PDBs tab. Enter a charging factor in the **Multiplier** field. Factors greater than 1.0 generate shift surcharges. Factors between 0 and 1.0 generate shift discounts.
- 4 To accept the shift charging definition, select **OK**. To return to the shift-charging implementation without accepting any changes, click **Cancel**.
- 5 After you make your selection, you return to the Site Administration tab. Notice that the functional menu area to the right now says *Common Shift Charges: Currently Defined*.
- 6 For each PDB that uses the Common Shift Charges, activate the PDB. Then select the Manage PDB tab. Select the **Define Surcharges, Discounts and Prorating** button and then the **PDB Shift Charges** action item. From the pop-up menu, select **Common Shift Charges**.

Note: If you do not visit each PDB and make this selection, no proration will occur. △

No Shift Charges

- 1 Select the **Common Shift Charges** option from the sub-window as described in the Location section of the Common Shift Charges topic. (See “Common Shift Charges” on page 51.)
- 2 Change all multipliers to 1.00 by selecting **Reset**.
- 3 To accept the changes, select **OK**. To return to the shift charging implementation without accepting any changes, select **Cancel**.
- 4 After you make your selection, you return to the Site Administration tab. Notice that the button text of the menu area to the right now says *Common Shift Charges: Currently Not Defined*.

Common Device Charges

Description:

The Device Definitions option enables you to map various devices to a functional group. For example, z/OS printer devices map to either a functional description such as "LASER," "FICHE," "IMPACT", or a charging qualification value such as

"BILLABLE" or "NON BILLABLE". This table is maintained as a Common Device Definition or as a PDB Device Definition. (See "PDB Device Charges" on page 64.) You can use any valid SAS code to group various devices. Within the comments is a sample definition. This task does not generate adjustments. It only permits groupings of character variables to be stored in the table.

Default:

There are no device definitions specified. As distributed, this routine contains only comments.

Location:

Select Site Administration from the SAS IT Charge Management main menu. Select **Define Default PDB Adjustments**. The sub-window on the right is updated. Select the **Common Device Charges** area to specify a device definition exit.

Activation:

- 1 Select the **Device Definitions** option from the Site PDB Defaults menu. The Device Definition Exit window opens.
- 2 This window enables you to use any valid SAS code to group your devices. By default, this exit contains only comments. Within the comments is a sample definition. You can use this routine to group devices such as printers, storage devices, and network devices. Various SAS IT Resource Management tables contain variables, such as device address or LU name, to test for grouping.
- 3 When you complete the definitions, select ☐ (window close) in the upper-right corner. Notice that the button text of the menu area to the right now says **Common Device Charges: Currently Defined**.

Common Processor Charges

Description:

The Common Processor Charges option enables you to specify a normalization factor that is applied to accumulated CPU time statistics so that a normalized CPU time quantity can be calculated. The normalization factors are machine-specific and facilitate a billing methodology for CPU time that is equitable across processor hardware configurations.

Note: For UNIX systems, the number of CPUs must also be considered. △

Default:


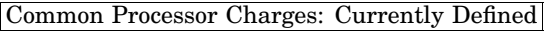
No processor normalization.

Location:

Select **Site Administration ► Define Default PDB Adjustments** From the sub-window on the right, select the **Common Processor Charges** action item. It enables you to code a Processor Normalization exit that is used for all PDBs unless it has been overridden by PDB-unique Processor Charges.

Activation:

- 1 Select the **Common Processor Charges** option as described, in Location. The Processor Normalization Routine Edit window opens.
- 2 This window enables you to use any valid SAS code to normalize processor time. By default, this exit contains only comments. Within the comments is a sample definition. Enter your SAS code here. The MACHINE variable contains the server identifier.

- 3 When you complete the definitions, select  (window close) in the upper-right corner. Notice that the button text of the menu area to the right now says .

Common Prorate Routine


Description:

The Common Prorate Routine task enables you to apply and maintain control parameters and proration specifications either at the Site level (common to all PDBs) or at the PDB level (unique to the active PDB). The structure of the proration specification table enables multiple output fields to be re-populated by the proration process.


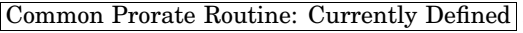
Default:

No proration.

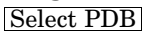
Location:

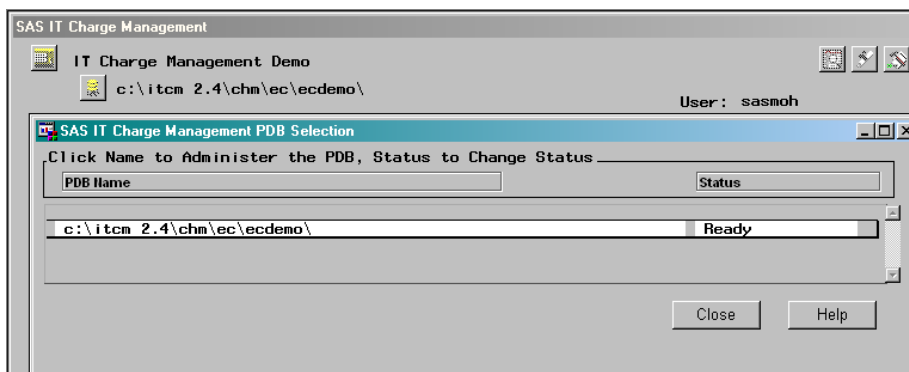
Select Site Administration from the SAS IT Charge Management main menu. Then select . From the sub-window on the right, select the menu selection area called **Common Prorate Routine**. The Common Prorate Routine enables you to specify a proration exit that is used for all PDBs unless overridden by the PDB-unique Proration Routine. (For more information, see “PDB Prorate Charges” on page 65.)

Activation:

- 1 Select the Common Prorate Routine option as described immediately above, in Location. The Proration Routine Edit window opens.
- 2 This window enables you to use any valid SAS code to define the proration routine. By default, this exit contains only comments. Within the comments is a sample definition. Enter your SAS code here. This exit is called during consolidation.
- 3 When you complete the definitions, select  (window close) in the upper-right corner. Notice that the button text of the menu area to the right now says .

PDB Selection

Each server installation of SAS IT Resource Management has one or more PDBs. In SAS IT Charge Management, there is only one active PDB at a time. If there is no active PDB, click  and the PDB Selection window opens:

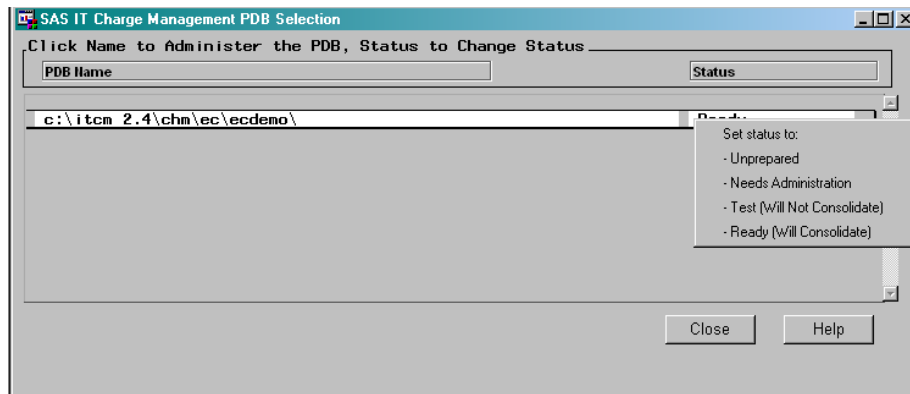


A list is presented of PDBs accessed in SAS IT Resource Management by your user id. The list shows the prefix of the PDB and its SAS IT Charge Management status. If you select a PDB, by clicking the PDB prefix, SAS IT Charge Management assigns librefs for that PDB.

When you select a PDB for which the **SAS IT Charge Management Status** is *Ready*, the ECDICT and ECPDB librefs are assigned.

The librefs are automatically defined and assigned depending on the selected PDB's platform. Occasionally, you might see messages about files being transferred from one platform to the other. The messages appear briefly, if at all, and indicate how many bytes have been transferred and how many more need to be transferred. After all assignments complete, SAS IT Charge Management displays the Manage PDBs tab.

Click the **Status** area for your PDB to open a pull-down menu.

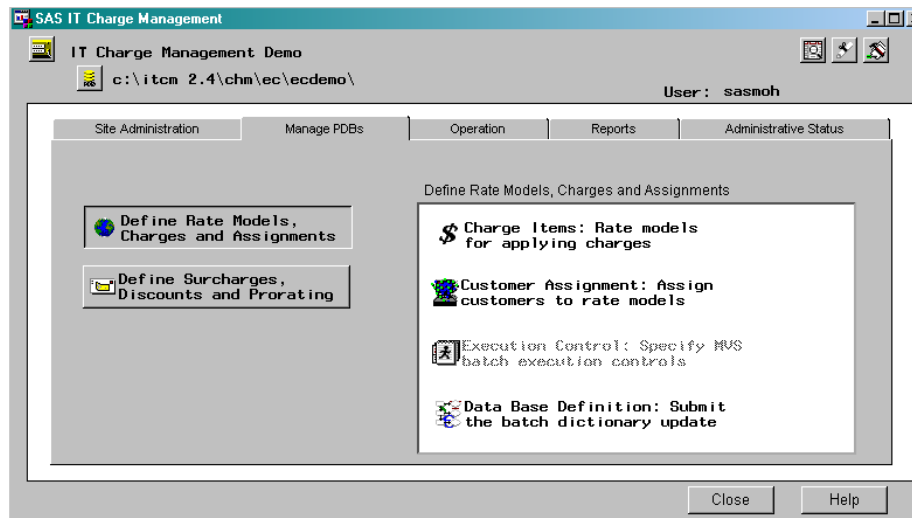


You can change the status of the PDB by selecting an entry from the pull-down menu. The initial Status of any PDB in SAS IT Charge Management is *Unprepared*. If you want to use the PDB with SAS IT Charge Management, selecting the PDB causes the Status to be updated from *Unprepared* to *Ready*. After you have selected the PDB, you can activate the chargeback feature for the selected PDB. To do this, you must activate charge items (see “Activate Chargeback - Charge Items” on page 57.)

- If the PDB has a status of *Ready*, but no charge items are activated, no charges will be incurred.
- *Needs Administration* is a Status you set in order to make the PDB temporarily unavailable for updating in SAS IT Charge Management.
- A Status of *Test* enables you to use the PDB in SAS IT Charge Management in all tasks on the graphical user interface except those that use consolidated data. A PDB with a Status of *Test* does not get its data incorporated into the consolidation file. However, at the various SAS IT Resource Management PDB levels, there is data for this PDB in the SAS IT Charge Management files.

Manage PDBs

After you select the PDB that you want to work with, the menu on the Manage PDBs tab opens:



For the selected PDB, you can specify what resources you want to charge for, how much to charge for each resource, and any criteria that affects charging for the resource. If you specify at least one resource to charge for in a PDB table, you activate chargeback for that PDB table in SAS IT Charge Management. Optionally, you can define PDB-unique adjustments. If you defined Common Adjustments, you can override those adjustments with a PDB-unique definition. (For information on defining Common Adjustments, see “Define PDB Default Adjustments” on page 51.)

Define Rate Models, Charges, and Assignments

This is the top menu button on the Manage PDBs tab. Selecting this button updates the sub-window on the right side of the tab with the actions items that you can perform.

Activate Chargeback - Charge Items

Note: Before you run the daily data processing job, make sure that at least one charge item has been activated in the rate model. Otherwise, the data processing job will fail. △

A charge item entry includes the charge items that are qualified and uniquely named. The unique name for a set of charge items that have been qualified is a Rate Model. In SAS IT Charge Management, a Rate Model has a two-part identifier: a description and an effective date.

- 1 Select **Define Rate Models, Charges, and Assignments** from the Manage PDBs window. The action item list in the sub-window on the right is updated.
- 2 Select **Charge Items** from the sub-window to open the Rate Model Charge Item Selection window:

PDB: c:\itcm 2.4\chm\ec\ecdemo\
 Display Rate Model: DEFAULT-01JAN1960 Display Table:
 Set currency: USD

Entry Format, Click Header to Sort

ModelDate	Item #	Table	Variable	Currency/Rate	Sort Active First
DEFAULT 01JAN1960	006009 <input checked="" type="checkbox"/> Act	XJOBS	CPUTM Total cpu time captured	USD - .11000000	<input type="checkbox"/> Normlz CPU <input checked="" type="checkbox"/> Shift Chg
DEFAULT 01JAN1960	006012 <input checked="" type="checkbox"/> Act	XJOBS	IOMDASD Connect time dasd	USD 0.00002000	<input type="checkbox"/> Normlz CPU <input checked="" type="checkbox"/> Shift Chg
DEFAULT 01JAN1960	007004 <input checked="" type="checkbox"/> Act	XPRINT	TOLINES Total print lines or print records	USD 0.00011000	<input type="checkbox"/> Normlz CPU <input checked="" type="checkbox"/> Shift Chg
DEFAULT 01JAN1960	006001 <input type="checkbox"/> Act	XJOBS	COSRBTM Task cpu srb time	USD 0.00000000	<input type="checkbox"/> Normlz CPU <input checked="" type="checkbox"/> Shift Chg
DEFAULT 01JAN1960	006002 <input type="checkbox"/> Act	XJOBS	CITCBTM Task cpu tcb time	USD 0.00000000	<input type="checkbox"/> Normlz CPU <input checked="" type="checkbox"/> Shift Chg
DEFAULT 01JAN1960	006003 <input type="checkbox"/> Act	XJOBS	CPHPTM Hiperspace processing cpu time	USD 0.00000000	<input type="checkbox"/> Normlz CPU <input checked="" type="checkbox"/> Shift Chg
DEFAULT 01JAN1960	006004 <input type="checkbox"/> Act	XJOBS	CPIIPTM I/o interrupt cpu time	USD 0.00000000	<input type="checkbox"/> Normlz CPU <input checked="" type="checkbox"/> Shift Chg

OK Cancel Help

- By default, the table is in order by item number. To sort the table by another field, select the desired field in the **Entry Format** portion of the window.
- Activate or deactivate charge items for the active rate model by toggling the **Act** check box. For each charge item that you activate, you can set the following criteria to influence the generation of charges for that particular item:

- Rate model
- Shift charges
- Rate
- Normalization for CPUs

The following functions can be performed:

Apply Shift Charges to Selected Entries

Select the **Shift Chg** check box to apply shift charges to (or clear shift charges from) the selected charge item. Shift charges are defined in the Definitions areas of “Common Shift Charges” on page 51 or “PDB Shift Charges” on page 62.

- Scroll down to the charge item that you want to apply shift charges to.
- Toggle the **Shift Chg** check box in the charge item entry so that it displays a check mark. The charges specified in the **Shift Charges** action item are applied to the charge item.

Normalize CPU for Selected Entries

Select the **Normlz CPU** check box to normalize charges for (or clear shift charges from) the selected charge item. Shift charges are defined in the definitions areas of “Common Shift Charges” on page 51 or “PDB Shift Charges” on page 62.

- Scroll down to the charge item for which you want to normalize CPU charges.
- Toggle the **Normlz CPU** check box in the charge item entry so that it displays a check mark. The shift charges specified in the Shift Charges action item are applied to the charge item.

Add a New Rate Model

- 1 Click the button next to the **Display Rate Model** field near the top of the window.
- 2 Select **Add a New Rate Model/Effective Date** from the pull-down selection list.
- 3 In the **Rate Model** field, enter a name to identify the rate model. If you specify the name of an existing rate model but give it a new (usually current) effective date, the existing rate model with the most current effective date gets copied into the new rate model. This is useful when you are updating rates.
- 4 In the **Effective Date** field, enter the date on which you want the rate model to take effect.
- 5 To accept the new rate model, select .
- 6 To reject the new rate model, select . You return to the Rate Model Charge Item Selection window.
- 7 For information on how to define the rate model, see “Customer Assignment” on page 59.

Delete a Rate Model

- 1 Click the button next to the **Display Rate Model** field near the top of the window.
- 2 Select the rate model that you want to delete.
- 3 Select the **Display Rate Model** field again. If the active rate model is not called **Default**, the drop-down list will have another entry called **Delete this rate model**. Select this entry to delete the rate model.

If the rate model is called **Default**, you cannot delete it. In this case, the entry **Delete this rate model** does *not* appear on the pull-down menu.

- 4 Select **Delete Rate Model** from the pull-down selection list. The Add/Delete Rate Model window appears prompting you with the selected rate model.
- 5 To delete the rate model, select .
- 6 To retain the rate model, select . You return to the Rate Model Charge Item Selection window.

Apply Rates to the Active PDB

- 1 Scroll down to the charge item to which you want to apply a rate.
- 2 Adjust the rate in the **Rate** field on the charge item entry. The rate is applied to the charge item.

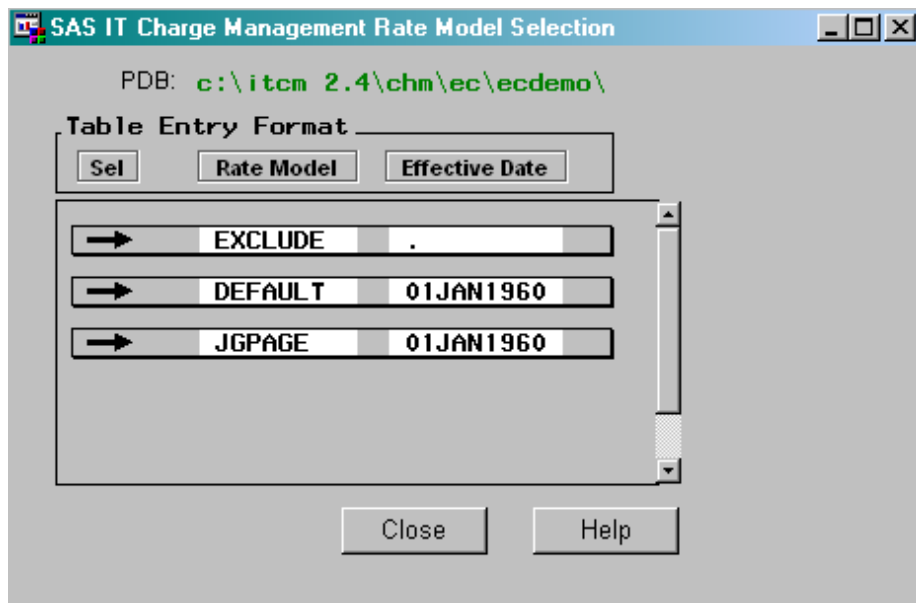
Note: Use a minus sign in front of the number to indicate that a rate is negative, for example, -1.2110000. △

Customer Assignment

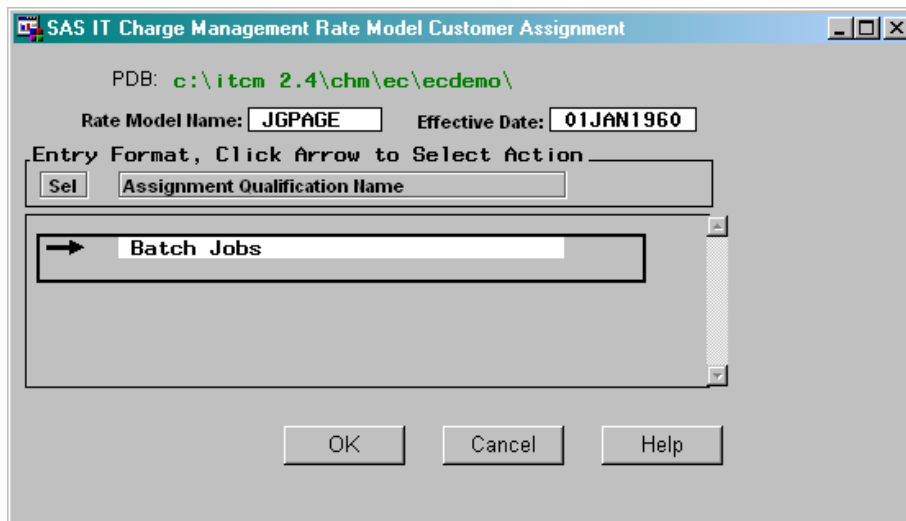
The Customer Assignment option lets you define and apply customized rate models to individual charge items.

Qualify a Rate Model

- 1 Select the **Selective Charging** option from the Manage PDBs window. The Rate Model Selection window appears:



- 2 Select the rate model that you want to customize. The Rate Model User Assignment window opens:



- 3 Select a qualification you want to customize.
- 4 From the pull-down menu, you can edit, copy, insert, or delete the qualification rate model. To edit the existing charging qualification rate model, select the qualification name or a new entry from the list. A Rate Model Qualification window for the selected charge item appears:

change. There is one observation for each combination of customer key name fields, date variables, charge item, rate model, and rate.

△

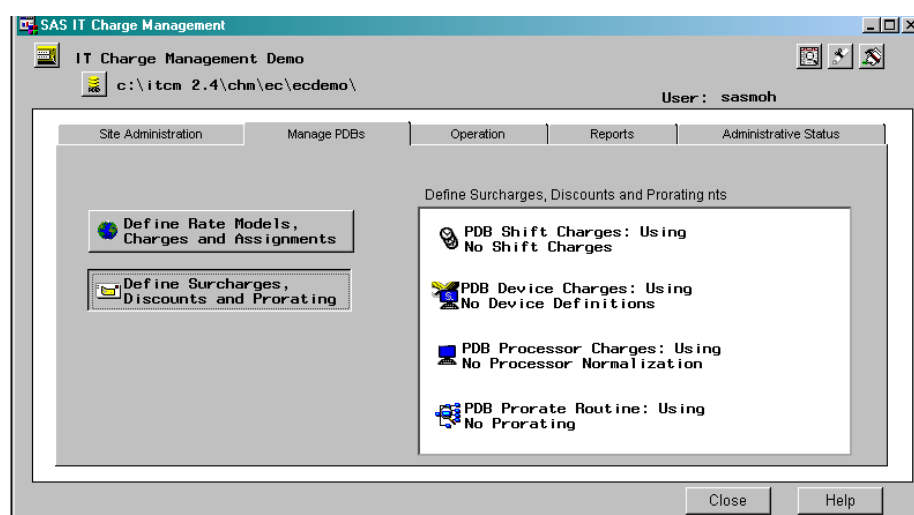
The Database Definition job uses the %CPDDUTL macro to update the tables.

For more information, see “Manage Charge Item Definitions” on page 33 and “Ad hoc Reporting” on page 98.

Define Surcharges, Discounts and Prorating

Define Surcharges, Discounts and Prorating is the last button on the Manage PDBs tab. The task items for this sub-window include Shift Multipliers, CPU Normalization, Proration, and Device Definitions.

Each of these task items is explained below.



PDB Shift Charges

Description:

The **PDB Shift Charges** item lets you define shift discounts or surcharges for any shift identifier defined in SAS IT Resource Management. This kind of chargeback methodology serves to encourage or discourage the consumption of data center resource based upon the shift during which the resource is utilized.

To implement a charging methodology that includes shift discounts and surcharges, you can enter a charging factor for any applicable shift. The charging factor is called a *shift multiplier*.

The Shift Charges option enables you to define a **Multiplier** for any charges that fall in a specified shift. Factors greater than 1.0 generate shift surcharges. Factors between 0 and 1.0 generate shift discounts. If the multiplier is less than 1, then a discount is generated. If the multiplier is greater than 1, then a surcharge is generated. If the multiplier is 1, also the default, then neither a surcharge nor a discount is generated.

You can maintain site-level shift discount and surcharge specifications from the Site Administration tab. You can maintain PDB-unique shift discount and surcharge specifications from the Manage PDBs tab.

Default:

No shift charges are specified. All shift multipliers are set to 1.00, so they have no effect on the charges.

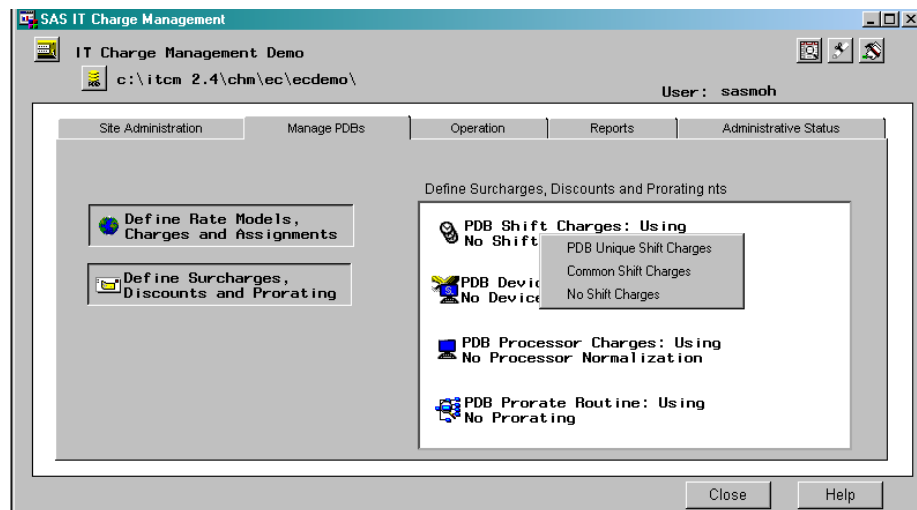
Location:

Select the Manage PDBs tab from the SAS IT Charge Management main menu. Then select the PDB you want to use. Click Define Surcharges, Discounts and Prorating. Select the **PDB Shift Charges** area to specify shift multipliers.

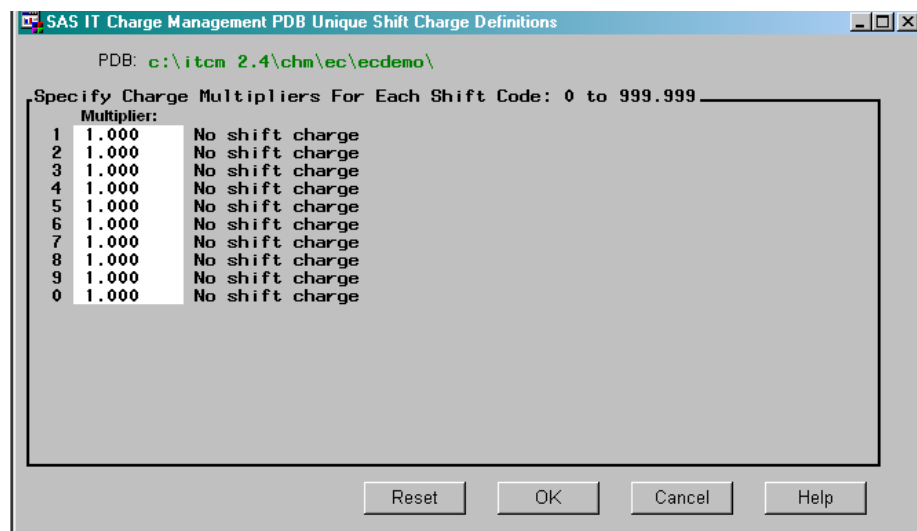
Activation:

For PDB-unique Shift Charges:

- 1 Select Define Surcharges, Discounts and Prorating from the Manage PDBs tab.
- 2 Select the **PDB Shift Charges** area. A pull-down menu appears indicating your choices: PDB Unique Shift Charges, Common Shift Charges or No Shift Charges.



- 3 Select **PDB Unique Shift Charges**.



- 4 For the active PDB, enter a charging factor in the **Multiplier** field. Factors greater than 1.0 generate shift surcharges. Factors between 0 and 1.0 generate shift discounts. Negative values are not permitted.
- 5 To accept the shift charging definition, select **OK**. To return to the previous shift-charging implementation, select **Cancel**. The **PDB Shift Charges** area displays a message to reflect the shift charging changes you have performed: either Using PDB-unique Definitions or Using No PDB-unique Definitions.

For Common Shift Charges:

- 1 Select **Define Surcharges, Discounts and Prorating** from the Manage PDBs tab.
- 2 Select the **PDB Shift Charges** action item. A pull-down menu appears indicating your choices: **PDB Unique Shift Charges**, **Common Shift Charges**, or **No Shift Charges**.
- 3 Select **Common Shift Charges**. The **PDB Shift Charges** area displays: *Using Common Definitions*.
- 4 The common Shift Charges are defined on the Site Administration tab in the **Define PDB Defaults and Adjustments** functional area.

For No Shift Charges:

- 1 Select the **Shift Charges** option.
- 2 Select **No Shift Charges** from the pull-down. **PDB Shift Charges** displays: *Using No Shift Charges*.

PDB Device Charges

Description:

The **Device Charges** option lets you map various devices to a functional group. For example, z/OS printer device names map to either a functional description such as LASER, FICHE, IMPACT, or a charging qualification value such as BILLABLE or NONBILLABLE. You can maintain this table as a Site-unique definition or you can utilize a PDB-unique definition that is maintained from an area under the Manage PDBs tab. This window enables you to use valid SAS code in order to group various devices to a single definition. Within the comments is a sample definition. Enter your SAS code here.

Default:

There are no device definitions specified. As distributed, this exit contains only comments.

Location:

Select the Manage PDBs tab from the SAS IT Charge Management main menu. Then select **Define Surcharges, Discounts and Prorating**. Select **Site PDB** defaults. Select **Device Definitions** to specify a device definition exit.

Activation:

- 1 Select **Device Definitions**. The Device Definition Exit window opens.
- 2 This window enables you to use valid SAS code in order to group your devices. By default, this exit contains only comments. Within the comments is a sample definition. Commonly grouped devices are printers, storage devices, and network devices. The SAS IT Resource Management table contains variables that are to be tested to establish grouping by such fields as device address or LU name. Enter your SAS code here. SAS Program Editor commands are available while this window is open.

- 3 When you have completed the definitions, select ☒ to close the window. Notice that the button text of the menu area to the right now says `PDB Device Charges: Using Unique Definitions`.

PDB Processor Charges

Description:

The **Processor Charges** action item enables you to specify a normalization factor that will be applied to accumulated CPU time statistics so that a normalized CPU time quantity can be calculated. The normalization factors are machine-specific and facilitate a billing methodology for CPU time that is equitable across processor hardware configurations.

Tip: For UNIX systems, take the number of CPUs into account as well.

Default:

No processor normalization.

Location:

From the SAS IT Charge Management main menu, select **Manage PDBs ► Define Surcharges, Discounts and Prorating ► PDB Processor Charges**

This enables you to code a Processor Normalization exit.

Activation:

- 1 Select the `PDB Unique Processor Normalization` option as described immediately above, in Location. The Processor Normalization Routine Edit window opens.
- 2 This window enables you to use valid SAS code in order to normalize your CPU to a single definition. By default, this exit contains only comments. Within the comments is a sample definition. The MACHINE variable contains the host identifier. SAS Program Editor commands are available while this window is open.
- 3 When you have completed the definitions, select ☒ to close the window. Notice that the button text of the menu area to the right now says `Using No Processor Normalization`, or `Using Common Normalization`, or `Using Unique Processor Normalization`.

PDB Prorate Charges

Description:

The **PDB Prorating Routine** enables you to apply and maintain control parameters and proration specifications either at the Site level or at the PDB level. The structure of the proration specification table enables multiple output fields to be re-populated by the proration process.

Default:


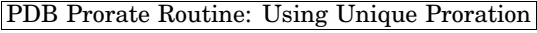
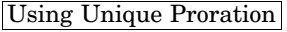
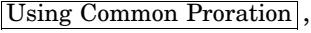
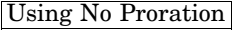
No proration.

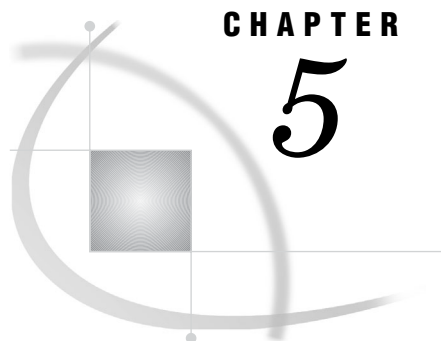
Location:

Select the Manage PDBs tab from the SAS IT Charge Management main menu. Select the PDB you want to work with. Then select

`Define Surcharges, Discounts and Prorating`. Select the **PDB Prorating Routine** area to specify a proration exit, turn off prorating for this PDB, or use the common definition (if one is specified).

Activation:

- 1 Select the **PDB Unique Proration** option from the pull down menu as described in Location. The Proration Routine Edit window opens.
- 2 This window enables you to use any valid SAS code to define the proration routine. By default, this edit contains only comments. Within the comments is a sample definition. Enter your SAS code here. This edit is called during consolidation.
- 3 When you complete the definitions, select  in the upper-right corner. The button text of the menu area to the right now says . Depending on your specifications, the button text can be , , or .



CHAPTER

5

Operation

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Operation: Overview

This section describes the daily and monthly tasks required to administer SAS IT Charge Management. These topics are available:

Daily Processing

Daily processing for collection of charges complements the normal SAS IT Resource Management process and reduce macros. SAS IT Charge Management uses the Generic Collector facility in SAS IT Resource Management. After you have selected a charge

item in a PDB and specified rate models, you need to update the IT Resource Management process and reduce tasks to process IT Charge Management data. This section discusses how to update the process and reduce tasks to specify the additional parameters and macros needed for SAS IT Charge Management. It also discusses the administrative tasks that should be performed on a daily basis.

DATECHK Global Macro Variable

The DATECHK global macro variable tells SAS IT Charge Management how to set the value of the Start Date of Invoice Period variable (E0INVSD). The macro variable is used during the execution of the %CxPROCES macro in your daily run. The default value is "default". The DATECHK syntax follows:

```
%global datechk;
%let datechk=default|force;
```

The E0INVSD class variable exists on all SAS IT Charge Management tables from the detail through the consolidation files. By default, E0INVSD is assigned a value of the start date of the current (open) invoice period during the execution of the %CxPROCES macro. During consolidation, E0INVSD determines which consolidation file the observation will be placed into.

DATECHK=DEFAULT

Internally in SAS IT Charge Management, DATECHK is set to default:

```
%global datechk;
%let datechk=default;
```

When DATECHK=DEFAULT, the E0INVSD variable is assigned the start date of the invoice period that is open. During normal processing, the DATECHK macro variable does not need to be specified.

Example 1:

Background: Assume today's date is March 5 and a Gregorian calendar is used. You are processing data for February 28. Invoice periods start on the 1st and 15th day of each month. No Datechk macro variable is specified; therefore, DATECHK is set to DEFAULT. The consolidation job has not run in March with a SYSPARM=-1 or AUTOINVC.

Result: Data for February 28 has variable E0INVSD set to 15FEB1999. The data for February 28 is accumulated into the invoice period that started on February 15.

Example 2:

Background: Assume today's date is March 6 and a Gregorian calendar is used. You are processing data for February 28. Invoice periods start on the 1st and 15th day of each month. No Datechk macro variable is specified; therefore, DATECHK is set to DEFAULT. The consolidation job ran on March 5 with SYSPARM=AUTOINVC.

Result: Data for February 28 has variable E0INVSD set to 01MAR1999. The data for February 28 is accumulated into the invoice period that started on March 1.

Example 3:

Background: This is an example for backloading data. Assume today's date is April 10 and a Gregorian calendar is used. You are processing data for February

28, backloading. Invoice periods start on the 1st and 15th day of each month. No Datechk macro variable is specified; therefore, DATECHK is set to DEFAULT. February was never consolidated. The invoice start date is 15FEB1999. After the update job ends, you consolidate with SYSPARM value -3 (invoice period Feb 15 is -3, Mar 1 is -2, Mar 15 is -1, and Apr 1 is 0), therefore closing the Feb 15 invoice period. While processing data for Mar 1, additional data for Feb 28 slips in.

Result: Data for February 28 has variable E0INVSD set to 01APR1999. The additional data for February 28 will be accumulated into the invoice period that started on April 1, 1999 (the current open period).

DATECHK=FORCE

The use of DATECHK=FORCE should not often be necessary. It is an override setting and must be specified before processing. FORCE causes the value of E0INVSD to be determined by the variable DATETIME. SAS IT Charge Management looks at DATETIME and determines which invoice period it falls into. Then it takes the first day of that invoice period and puts that value into E0INVSD. Normal processing uses the system date, determines which invoice period that system date falls into, and then uses the first day of that invoice period to populate E0INVSD. The syntax is:

```
%global datechk;
%let datechk=force;
```

If you use DATECHK=FORCE, you must follow these additional steps. First, process all the data that is to be forced into closed invoice periods. Then, re-consolidate those closed invoice periods (specifying the appropriate SYSPARM values).

After you have made changes to an invoice period, you then need to rerun and redistribute your invoices and other reports. Otherwise, the invoices that the customers received earlier would no longer match your data. Finally, if you use AccountView, you need to replace the extract file.

Example:

Background: Assume today's date is January 5 and a Gregorian calendar is used. You are processing data for January 4. Invoice periods start on the 1st and 15th day of each month. Suppose that due to the holidays, the last 3 days' data from December was not processed. However, you did not find out about this until after you ran a consolidation to close out December. You ran the consolidation (SYSPARM = AUTOINVC) but you have not yet run the invoice job or distributed any reports.

At this point, you have two options. You can force the data into December using DATECHK=FORCE, and re-consolidate before running invoices. The other choice is to process with the default and allow those three days' data to fall into the January invoice period.

Result: If you re-consolidate December, you specify:

```
%let datechk=force;
```

on the update of the daily run that processes the data from the 3 missing days in December. Data for those days has variable E0INVSD set to 15DEC1999.

Update the Process and Reduce Tasks

Setting up a job to collect and process data starts with a copy of the current SAS IT Resource Management process and reduce tasks, which are implemented through

macros. On an Open Systems server, the tasks are in a shell script that calls a SAS macro that loads the raw data into the PDB. On a z/OS server, the daily run consists of the JCL and SAS statements that load the raw data into the PDB. For all servers, the objective of the task is to process the raw data into the detail level of the PDB and then reduce the data to the summary levels of the PDB.

If you are not the SAS IT Resource Management administrator, you need to work with the SAS IT Resource Management administrator closely. Here is a summary of the six additions you need to make to the existing tasks. After the summary, each change is explained in detail; then examples are shown for each server platform.

- 1 Add the SAS IT Charge Management macro library to SASAUTOS.
- 2 Add a FILENAME statement for the SAS IT Charge Management site control file.
- 3 Add an INCLUDE statement for macro code that starts SAS IT Charge Management.
- 4 Add a call to the macro that starts SAS IT Charge Management.
- 5 Add an EXITSRC= parameter to your current %CxPROCES macro call.
- 6 Add another %CxPROCES macro call after the existing %CxPROCES macro call.

Note: There can be many variations of the SAS IT Resource Management job or script. If you have a special situation or need assistance in setting up the process and reduce job or script for SAS IT Charge Management, please contact SAS Technical Support. △

1. Add the Macro Library to SASAUTOS

Add the SAS IT Charge Management Macro Library to SASAUTOS.

The OPTIONS statement at the beginning of the job or script includes a parameter called SASAUTOS=. This parameter usually contains several macro or source libraries already. Add the SAS IT Charge Management autocall library to that list.

For z/OS, this library is created with the following convention:

```
siteprefix.EC.AUTO
```

where

siteprefix	is the high-level qualifier that the SAS IT Charge Management libraries have in common. Sometimes this high-level data set qualifier is the same as the SAS IT Resource Management high-level qualifier.
EC	is a node added to all SAS IT Charge Management libraries during the allocation and initialization process for a site definition.
AUTO	is the z/OS name for SAS IT Charge Management autocall macro code.

For Open Systems servers, assign a libref for the autocall directory like this:

```
libname ecautos '/siteprefixpath/ec/auto';
```

For Windows servers, assign a libref for the autocall directory like this:

```
libname ecautos '\siteprefixpath\ec\auto';
```

where

siteprefixpath	is the part of the full path that the SAS IT Charge Management modules have in common. This path should not be the same as a SAS IT Resource Management PDB's path.
----------------	---

EC	is a sub-directory added to all SAS IT Charge Management paths during the allocation and initialization for a Site definition.
AUTO	is the sub-directory name for the SAS IT Charge Management autocall macro code.

2. Add a FILENAME Statement

Add a FILENAME Statement for the SAS IT Charge Management Site Control Library.

This statement assigns the file containing common SAS IT Charge Management code, including the %ECSTART macro's code. The statement can be added anywhere before the %INCLUDE ECSCNTL(ECSTART) statement.

For z/OS servers, the FILENAME statement should look as follows:

```
FILENAME ECSCNTL 'SITEPREFIX.EC.SCNTL' DISP=SHR;
```

For Open Systems servers, it should look as follows:

```
filename ecscntl '/siteprefixpath/ec/scntl';
```

For Windows servers, it should look as follows:

```
filename ecscntl '\siteprefixpath\ec\scntl';
```

3. Add an INCLUDE Statement to %ECSTART

Add an INCLUDE Statement for the Macro Code That Starts SAS IT Charge Management.

This statement pulls the %ECSTART macro code into the jobstream or script.

For all platforms, the statement is coded as follows:

```
%INCLUDE ECSCNTL(ECSTART);
```

This statement must occur after the FILENAME statement and before the %ECSTART call that is discussed in the next step. The INCLUDE statement looks the same on all platforms.

4. Add a Call to the %ECSTART Macro

Add a Call to the Macro That Starts SAS IT Charge Management.

This statement executes the %ECSTART macro.

```
%ECSTART(SITEPFX=SITEPREFIX.,
          PDBPFX=PDBPREFIX.,
          PROCESS=COLLECT );
```

The purpose of the %ECSTART macro is to set up the proper environment for SAS IT Charge Management processing. This macro has four parameters:

SITEPFX= specifies the location of the common SAS IT Charge Management libraries.

For z/OS servers, this location is the high-level data set qualifier.

For Open Systems and Windows servers, this location is a fully qualified path. SAS IT Charge Management appends the SAS IT Charge Management sub-directory to this location.

PDBPFX=	specifies the location of the PDB-specific SAS IT Charge Management libraries. <i>For z/OS servers</i> , this location is the high-level data set qualifier. <i>For Open Systems and Windows servers</i> , this location is a fully qualified path. SAS IT Charge Management appends the SAS IT Charge Management sub-directory to this location.
PROCESS=	tells %ECSTART to include the SAS IT Charge Management code required for processing newly collected data into the PDB.
DEBUG=	is used to troubleshoot problems. It defaults to a null value. The settings are DEBUG=YES, DEBUG=Y, or DEBUG= . Y or YES turns debugging information on. To turn off debugging information, specify DEBUG= (parameter without a value) or omit the DEBUG= parameter.

5. Add an EXITSRC= Parameter

Add an EXITSRC= Parameter to the Current %CxPROCES Macro Call.

The EXITSRC= parameter of the %CxPROCES macro enables you to point to a specific location where SAS IT Charge Management stores code for the SAS IT Resource Management exits that it uses. SAS IT Charge Management makes use of these standard exit points.

The additional parameter is as follows:

```
EXITSRC=ECSITE.ECEXITS
```

For z/OS servers, the following is an example of an updated %CMPROCES macro call.

Note: If you or the SAS IT Resource Management administrator uses the SAS IT Resource Management exit points, please review the section called “SAS IT Resource Management Exit Points” on page 113. △

```
%CMPROCES(,EXITSRC=ECSITE.ECEXITS,
           COLLECTR=SMF,
           TOOLNM=MXG);
```

For Open Systems, Windows, and z/OS servers, this is an example of an updated %CPPROCES macro call.

```
%CPPROCES(COLLECTR=GENERIC,
           TOOLNM=SASDS,
           GENLIB=ECWORK,
           EXITSRC=ECSITE.ECEXITS);
```

For UNIX servers, this is an example of an updated %CPPROCES macro call.

```
%CPPROCES(, COLLECTR=ACCUNX,
           RAWDATA=/dataLocation/,
           TOOLNM=SASDS,
           EXITSRC=ECSITE.ECEXITS);
```

Note: Never use %CSPROCES with SAS IT Charge Management. The purpose of %CSPROCES is to list the files to process. This is not necessary in SAS IT Charge

Management. An additional problem is that, after it finishes processing, %CSPROCES deletes the contents of the work file. △

6. Add Another Call to the %CxPROCES Macro

Add Another Call to the %CxPROCES Macro after the Existing %CxPROCES Call.

When the second call executes, it creates SAS IT Resource Management tables from SAS IT Charge Management data created by the first macro call. It uses a standard %CxPROCES macro, called with the Generic Collector Facility and a GENLIB of ECWORK.

For z/OS servers, the following is an example of a second %CMPROCES call:

```
%CMPROCES(,COLLECTR=GENERIC,
           TOOLNM=SASDS,
           GENLIB=ECWORK,
           EXITSRC=EXSITE.ECEXITS2);
```

For Open Systems and Windows servers, the following is an example of the second %CPPROCES call:

```
%CPPROCES(COLLECTR=GENERIC,
           TOOLNM=SASDS,
           GENLIB=ECWORK,
           EXITSRC=ECSITE.ECEXITS2);
```

For UNIX servers, this is an example of the second %CPPROCES macro call.

```
%CPPROCES(, COLLECTR=ACCUNX,
           RAWDATA=/dataLocation/,
           TOOLNM=SASDS,
           EXITSRC=ECSITE.ECEXITS2);
```

Sample Process and Update Jobs

This sample for a z/OS site includes the code added for SAS IT Charge Management.

Note: Code added or changed for SAS IT Charge Management is indicated by comments. △

```
%CMPROCES(, EXITSRC=ECSITE.ECEXITS,
```

This sample job assumes that the only collector that has data in this PDB is SMF. The site prefix is SITEPREFIX. The PDB prefix is PDBPREFIX. The SAS IT Resource Management prefix is ITSV.TS45002 and MXG prefix is MXG.Vnnnn.

```
//ITSVEC01 JOB (,B66),'COLLECT',MSGLEVEL=(1,1),NOTIFY=ITSVEC,
// TIME=(19,59)
/*JOBPARM FETCH
//JS001 EXEC SAS,REGION=32M,WORK='20500,2500',
// OPTIONS='SOURCE MEMSIZE=32M DMSBATCH BATCH TERMINAL
// $NOSYNTAXCHECK'
//SMF DD DISP=SHR,DSN=SMF.INPUT.DATA(0)
//SYSIN DD DATA,DLM='@@'
```

```

OPTIONS MAUTOSOURCE NOIMPLMAC ERRORABEND DQUOTE NOOVP NOCENTER;
libname ECAUTOS 'ITSV.EC.AUTO' DISP=SHR; /* this code was added or      */
                                           /* changed to correspond to    */
                                           /* Update 1 described above.  */

%CPSTART(
    MODE=BATCH,
    SYSTEM=Z/OS,
    ROOTSERV=, SHARE=N/A,
    ROOT=ITSV.TS45002.,
    SITELIB=ITSV.SITELIB, SITEACC=OLD,
    PDB=PDBPREFIX., DISP=OLD,
    MXGLIB=MXG.Vnnnn.LIBRARY,
    MXGSRC=('ITSV.SOURCLIB' 'MXG.Vnnnn.SOURCLIB')
);

FILENAME ECSCNTL 'SITEPREFIX.EC.SCNTL' DISP=SHR; /* this code was added or */
                                                  /* changed to correspond */
                                                  /* to Update 2 described */
                                                  /* above.                */

%INCLUDE ECSCNTL(ECSTART); /* this code was added or changed to correspond */
                           /* to Update 3 described above.          */

%ECSTART(SITEPFX=SITEPREFIX., /* this code was added or changed */
        PDBPFX=PDBPREFIX.,    /* to correspond to Update 4      */
        PROCESS=COLLECT      ); /* described above.                */

%CMPROCES(,
    EXITSRC=ECSITE.ECEXIT, /* this code was added or changed */
                           /* to correspond to Update 5      */
                           /* described above.              */

    COLLECTR=SMF,
    TOOLNM=MXG);
%CMPROCES(, EXITSRC=ECSITE.ECEXIT2, /* this code was added or */
    COLLECTR=GENERIC, /* changed to correspond */
    TOOLNM=SASDS, /* to Update 6          */
    GENLIB=ECWORK); /* described above.     */

%CPREDUCE();
@@

```

This sample job for a UNIX server includes the code added for SAS IT Charge Management.

Note: Code added or changed for SAS IT Charge Management is indicated by comments. △

This example assumes that the only collector whose data is in this PDB is Aprisma SPECTRUM. The site prefix is **/path/to/your/site**. The PDB prefix is: **/path/to/your/pdb**. Note that the prefixes have trailing delimiters when they are referenced in the ECSTART macro.

```

%cpstart(mode=batch
        ,sitelib=/path/to/your/sitelib
        ,siteacc=write

```



```

,pdb=/path/to/your/pdb
,access=write      );

libname indata "/path/to/your/data";

filename ecscntl "/path/to/ec/scntl/"; /* this code was added or changed */
                                     /* to correspond to Update 2      */
                                     /* described above.                */

%cscsifmt(modelds=indata.model);
    %include ecscntl(ecstart); /* this code was added or changed to */
                              /* correspond to Update 3          */
                              /* described above.                */

%ecstart
    (sitepfx=/path/to/your/site/prefix/ /* this code was added or changed */
    ,pdbpfx=/path/to/your/pdb/           /* to correspond to Update 4      */
    ,process=collect                      /* described above.              */
    );

%cpproces(indata.wa_link,
    csiwal,
    collectr=spectrum,
    exitsrc=ecsite.ecexits ); /* this code was added */
%cpproces(,esiwal,           /* or changed          */
    collectr=generic,        /* to correspond to    */
    toolnm=sasds,            /* Update 5            */
    exitsrc=ecsite.ecexits2, /* described           */
    genlib=ecwork);          /* above.              */

%cpproces(indata.rtrcisco,
    ccirot,
    collectr=spectrum,
    exitsrc=ecsite.ecexits /* this code was added */
);

%cpproces(,ecirot,           /* or changed          */
    collectr=generic,        /* to correspond to    */
    toolnm=sasds,            /* Update 6            */
    exitsrc=ecsite.ecexits2, /* described           */
    genlib=ecwork);          /* above.              */

%cpreduce();

```

This sample job for a Windows site includes the code added for SAS IT Charge Management.

Note: Code added or changed for SAS IT Charge Management is indicated by comments. \triangle

This sample assumes the only collector whose data is in this PDB is NTSMF. The site prefix is: **\path\to\your\site**. The PDB prefix is: **\path\to\your\pdb**.

Note: The prefixes when referenced in the ECSTART macro have trailing delimiters. \triangle

```

filename ecscntl "d:\SAS\cpe\chm\ec\scntl"; /* This code was added or changed */
                                           /* to correspond to Update 2      */
                                           /* described above.                */

%include ecscntl(ecstart);    /* This code was added or changed */
                             /* to correspond to Update 3      */
                             /* described above.                */

%ecstart(sitepfx=\path\to\your\site\,    /* This code was added or changed */
         pdbpfx=\path\to\your\pdb\,      /* to correspond to Update 4      */
         process=collect                  /* described above.                */ );

%cpstart(pdb=\path\to\your\pdb
         mode=batch,
         access=write );

%cpproces(,collectr=WINNT,
          toolnm=NTSMF,
          rawdata=\path\to\raw\data\*.smf,
          exitsrc=ecsite.ecexits,        /* This code was added or changed */
                                           /* to correspond to Update 5      */
                                           /* described above.                */
          _rc=PROCRC                      );

%cpproces(,collectr=generic,              /* This code was
          toolnm=sasds,                    /* added or changed to
          genlib=ecwork,                   /* correspond to Update 6
          exitsrc=ecsite.ecexits2);        /* described above.

%cpreduce();

```


Run the Process and Reduce Job

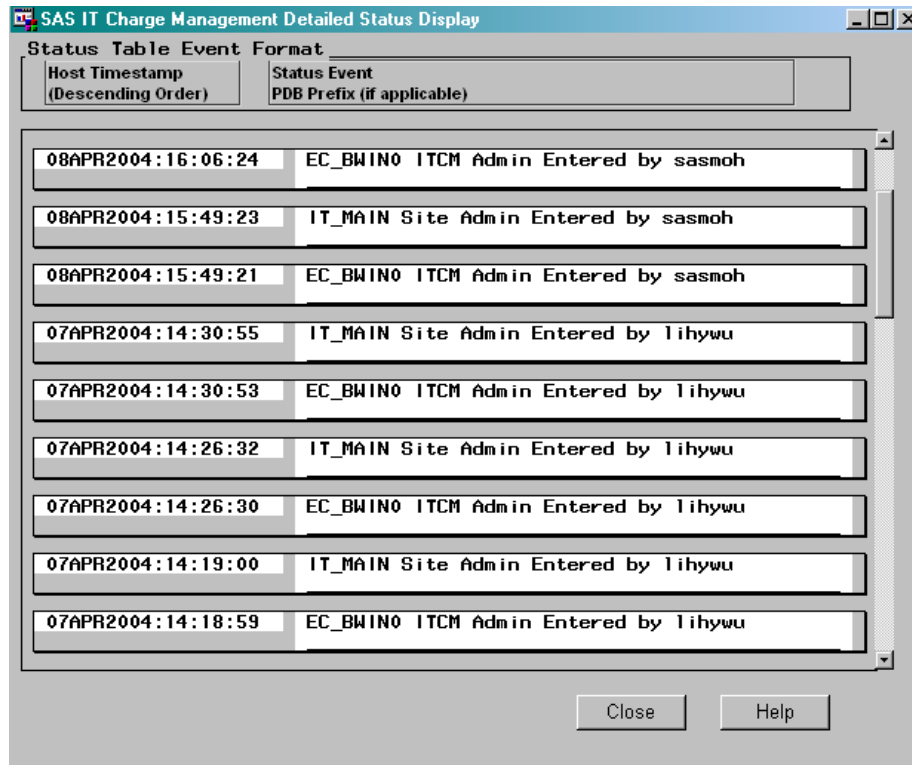
Ideally, the process and reduce job should be run on a daily basis with input data from the prior day. The process and reduce job is the shell script and SAS IT Resource Management macros that process the raw data into the PDB and reduce it. SAS IT Charge Management currently does not have a facility to submit the process and reduce job or script directly to the server host. Thus, you will need to use a host-based scheduling package or **cron_tab** (see your vendor's users manual for **cron** or **at**) to ensure the process and reduce job runs daily.

Missed days can be input, but be sure the SAS IT Resource Management filtering macros are being used to prevent duplicate data from being processed into the SAS IT Resource Management tables whose data is being used as input to SAS IT Charge Management. See the SAS IT Resource Management Macro Reference documentation for more information on the duplicate checking macros.

If you have a requirement to backload data and process it into SAS IT Charge Management, contact SAS Technical Support. Special considerations need to be addressed, such as in which invoice periods the data belongs.

Detailed Status

Click the  icon located on the top right of many SAS IT Charge Management windows. This opens the Detailed Status window.



The fields in this window are read only. The window shows two columns of information. The left window contains the **Host Timestamp** (server timestamp), which gives the date and time of the event described in the right column. The right column contains the **Status Event**, which gives a description of the actions performed by SAS IT Charge Management administrators. If the event was performed on a particular PDB, then the PDB name is included in the **Status Event** column. These events are sorted in reverse chronological order. Thus, the most recent events are displayed at the top of the list.

You can use the scroll bar to view older events. Select **Close** to return to the previous window.

Daily SAS IT Charge Management Administrator Tasks

Each day, the SAS IT Charge Management Administrator needs to perform certain tasks to ensure the accurate assignment of charges. Performing these tasks on a daily basis is substantially less work than trying to make changes at the end of the invoice period and attempting to make those changes retroactive.

Review Collection Job/Script Listing

Verify that there were no errors in the SASLOG from the process and reduce job (or script) listing. Any *ERROR:* messages should be investigated immediately. Be sure to have the exact wording of error messages if you contact SAS Technical Support. Look at the data input report in the SAS output and ensure that records were processed into all expected tables. Additionally, make sure the input data is as expected: that it has the proper date range (usually yesterday), that it includes all machines, and that it includes all data sources.

Review Revenue

Using data exploration, reports, or interactive SAS, review the distribution of revenue across keys, across time, and across reporting groups. If this is performed on a regular basis, you will come to recognize the normal distribution of revenue. Any abnormalities will be immediately obvious to you. This enables you to start investigations in a timely manner and have answers before anyone else asks questions.

Unassigned Charges and Suspend Processing

In your Customer Key Identification Routine, it is prudent to create a default bucket (key value) where you put input values that currently do not map to any known key value. Because your identification routine is not able to assign a "known" key name structure, these charges are not assigned to anyone for invoicing. Investigate these values and update the Customer Identification Routine. Add the necessary debits and credits for any charges already processed.

Suspend Reports If you have Suspend Processing turned on, Suspend Reports are generated as part of the output from your process and reduce run. A quick glance at these reports lets you know if any new data was put into the Suspend File. If so, you can review the contents of the Suspend File, update your identification routine accordingly, then run %ECPROCES to bring the data into your PDB. (For more information, see the section on Suspend Processing in the "Customer Identification Routine" on page 26.)

The following is an example of the Suspend Reports:

Reports from first %CxPROCES

Synopsis of new chargeback data 16:10 Tuesday, July 29, 1997

Table Name	Charge Type	Record Count
ETESTDT	00	50
ETESTDT	01	50

Reports from first %CxPROCES - Suspend Run

Synopsis of data suspended this run 16:10 Tuesday, July 29, 1997

Table Name	Date Suspended	Record Count
UTESTDT	29July97	00

Reports from second %CxPROCES

Synopsis of data suspended this run 16:10 Tuesday, July 29, 1997

Table Name	Date Suspended	Record Count
------------	----------------	--------------

UTESTDT

29July97

65

Verify That Changes Took Effect

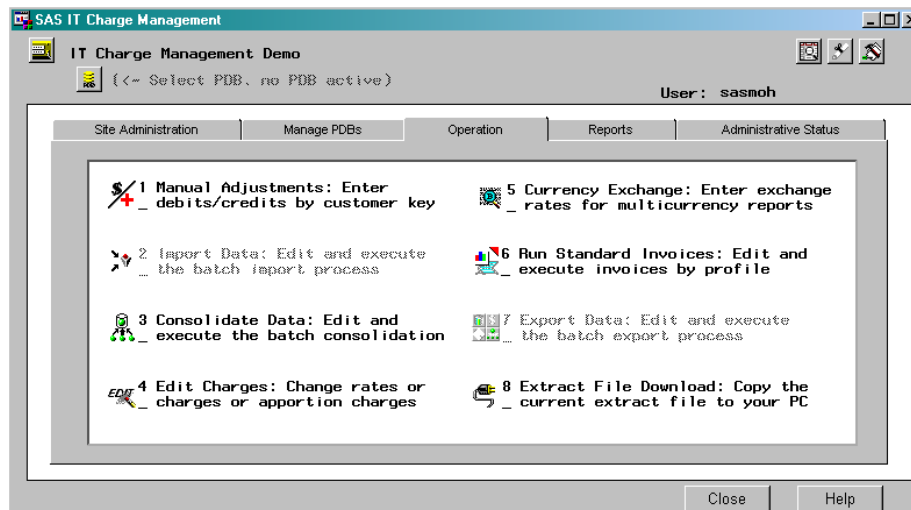
If you made any changes to your parameters in SAS IT Charge Management, verify that those changes are reflected in the next process and reduce run. It is much easier to make a correction, restore one day from backups, and rerun with the correct parameters, rates, and so on, than to try to deal with incorrect modifications at the end of the month.

Update Profiles from New Values of Keys

After the collection of new data is completed (through the process and reduce step), you can assign any new key values to Invoice Profiles. (For more information, see “Customer Profile Information” on page 29.) SAS IT Charge Management automatically detects new key value combinations and updates the customer information table to reflect the additional values.

Invoice Period End Processing

This section discusses the administrative tasks that should be performed on a periodic or monthly basis. Invoice Period End processing closes out an invoice period. Invoice Periods are defined in the **Maintaining Site Defaults and Accounting Calendar** task area. (See “Manage Site Defaults and Accounting Calendar” on page 18.) Invoice Period End processing is performed by using the Operations tab. Invoice Period End processing does not necessarily include all steps on the Operations tab. For example, if no Import Exits are defined in the **Manage Open Interface** area of the Site Administration tab, then the **Import Data** step on the Operations tab is grayed out. Selecting the Operations tab from the SAS IT Charge Management main menu displays this window:



Manual Adjustments

Any final debits and credits should be entered at the end of the month or invoice period. Debit and credit data entry is described in detail in the section on “Debits and Credits” on page 40.

Import Data

You can submit the batch program to import data as specified in the data import exits.

Location:

From the SAS IT Charge Management main menu, select the Operations tab. Then select **Import Data**.

Note: A Data Import Exit must be specified for this button to be active. △

Activation:

- 1 On the Operations tab, select **Import Data**. A generated job or script appears.
- 2 A system-generated comment is added into the job or script showing the date and time of generation. Find the date, and determine if it is current.
- 3 If the job or script is not current, you can regenerate it by selecting **Regenerate** from the menu bar at the top of the window.
- 4 You can run the job or script by selecting one of the **Submit** options from the menu bar.
- 5 Review the output to verify that it completed successfully.

See also “Import/Export” on page 42.

Consolidate Data

Description:

The Consolidation Data task generates a batch job or script that combines data from all SAS IT Charge Management tables in all PDBs for the site whose status is “Ready”. The consolidation job also performs proration if it is defined. If the AccountView Extract File is enabled, this job also creates the Extract File. (For more information, see “Extract Data Setup” on page 50.) The consolidation job can be rerun any number of times without restoring. It is important to consolidate the data for all PDBs at a site before attempting to generate an invoice.

At the end of the invoice period, run the consolidation. The consolidation run creates the all-in-one file (the consolidation file) which is used as input for invoices.

If you run a consolidation to close out a period, then the run is referred to as *Consolidation*. If you run a consolidation to create an invoice-period-to-date file, then the run is called *Partial Consolidation*.

If you want to rerun the consolidation (for example, to add debits or credits) for an already closed invoice period, the run is called *Reconsolidation*.

Consolidation has several input files. The Consolidation uses neither the profile nor the budget information. The SAS IT Charge Management charge tables (“E” tables) from all PDBs with a status of “Ready” in the SAS IT Charge Management

client are used as input. (For information on variables in the PDB “E” tables, see “Variables in the PDB “E” Tables Files” on page 120.) The month reduction level is used. SAS IT Charge Management subsets the data using the E0INVSD variable. Also, the debit and credit file is combined with the PDB tables. See also “DATECHK Global Macro Variable” on page 68.

The consolidation combines all of the input files and summarizes the data to create a consolidation file. Then the run creates additional data views. Finally, the run updates SAS IT Charge Management internal formats. The date and time that the consolidation ran is entered in the **Detail Status** field.

The consolidation can be rerun any number of times. It can even be run for an open invoice period in order to produce a file that contains period-to-date information. This enables you to test invoices or other reports before the invoice period closes.

The consolidation can also be rerun for closed periods if the input data is still available. For example, if you want to rerun the consolidation for an invoice period 8 months ago, the SAS IT Resource Management MONTH library must contain data in the “E” tables from 8 months ago. Additionally, that data must be available online. If the data is archived, then it must be brought back from archive before the consolidation runs.

Note: Any edits made to the modified rates, modified charges, or modified apportioned charges are lost if a consolidation is rerun. △

The output files of the consolidation are not part of any PDB. Because they contain data from many PDBs, the consolidation files and the associated views are stored in the ECDATA library. This library is a site-level SAS IT Charge Management library.

The output files of the consolidation include:

- the closed period consolidation file
- the open period consolidation file
- additional views of the consolidation files
- the Account View extract (if enabled)
- internal information

Internal information consists of the key values table and the invoice period status format.

The key values table is used by the [Fill Keys](#) on the **Customer Profile** and **Supplemental Charges** action items. This table includes all customer name key values seen in data processed. You can use this table to ensure that all values are assigned to a profile.

The Invoice Period Status format is an internal SAS IT Charge Management format that lists each of the invoice periods and its status. The status can be **Open** or **Closed**.

- An invoice period is open if it meets these criteria:
 - Data has been processed with a create date later than the most recent invoice period start date in the internal table.
 - The consolidation job has not been run after a new invoice start date has passed.

Note: Usually the open invoice period is the current invoice period or the one just passed. If the open invoice period is the one just passed, the consolidation job closes out that period and creates a new open period. However, if you are backloading data, then the

open period is the period that has not yet had a consolidation run for it. △

- An invoice period is closed if it meets these criteria:
 - A new invoice period start date is reached.
 - A consolidation with the appropriate SYSPARM value is run after the new invoice period start date is reached.

Note: The closed invoice periods are periods for which a consolidation ran successfully. This means that the invoice period end date must have elapsed. It also means that the appropriate SYSPARM value had to be used when executing the consolidation in order to point to the invoice period to be closed. (For more information, see “Use the System SYSPARM Options” on page 84.) △

Note: If the Consolidation job or script fails, check the SAS log. If there is an error message: "Cannot %include ECTABLST in aggregate ECPDBC02", look in the log above the message. If there is a SAS NOTE indicating that the server host has successfully allocated the SAS IT Charge Management PDB library as ECPDBC02, then there are two probable causes for the error message:

- 1 A defined PDB was later deleted through the file system and not through SAS IT Resource Management, so SAS IT Resource Management has not deleted the name of the PDB from SASUSER.CPUSROPT, which is the table SAS IT Charge Management uses to determine the list of known PDBs for a Site.
- 2 There is more than one PDB but at least one PDB is not installed properly. The following steps walk you through marking the PDB *Inactive* to SAS IT Charge Management:
 - a Launch SAS IT Charge Management.
 - b Open the Site.
 - c Go to the Select PDB window by selecting **PDB** at the top of one of the SAS IT Charge Management windows, or by selecting the **Manage PDBs** tab.
 - d Select **Status** to mark the deleted PDB *Inactive*. A drop-down menu will give you the option of marking the status *Inactive*.
 - e Select the **Site Administration** tab.
 - f Select something to make **Site** generation occur. This can be as simple as re-selecting your **Default Currency**.

△

Location: From the SAS IT Charge Management main menu, select the **Operations** tab. Select **Consolidate PDB Data**.

Activation:

- 1 On the **Operations** tab, select **Consolidate PDB Data**. A generated job or script appears.
- 2 Verify that the generation date is current. A comment is created into the job or script showing the date and time of generation. Find the date, and make sure it is current.
- 3 If the job or script is not current, you can regenerate it by selecting **Regenerate** from the menu bar at the top of the window.
- 4 You can run the job or script by selecting one of the **Submit** options from the menu bar.
- 5 Review the output to verify that the job or script completed successfully.

See also “DATECHK Global Macro Variable” on page 68.

Consolidation Messages

When the consolidation process is run, messages are generated in the SAS log. This section reviews the various messages generated when the consolidation completes successfully and when it fails.

When the consolidation process completes successfully, a series of notes are generated:

- one NOTE: line for every PDB that adds data to the consolidation process
- one section of NOTE:s for the consolidation table name, observation count, SYSPARM value used and the invoice period start date used
- one NOTE: line that says that the extract file was built or suppressed by option
- one NOTE: line that says that the key table was built or suppressed by option
- a NOTE: that the processed completed.

The following is a sample of these messages:

```
NOTE: Contributing PDB: /u/itsv23/sapr3pdb/
NOTE: Consolidated data table E_14670W is being
NOTE: built for the invoice period you selected.
NOTE: It will have 33 observations.
NOTE: SYSPARM=02MAR2000 Invoice Start Date=01MAR2000
NOTE: EC AccountView data extract has been suppressed by option.
NOTE: Key assignment table being built.
NOTE: Consolidation successfully completed.
```

If the consolidation fails, one of the following sets of error messages is generated:

- If no PDBs are known to SAS IT Charge Management or none of the PDBs defined have a status of *Ready*, the consolidation abends with U0095 and the following error messages:

```
ERROR: There is no charge data for the invoice start date
ERROR: you selected because no ready PDBs containing charge
ERROR: data were found. This could be because PDB definition
ERROR: or maintenance application was incomplete.
ERROR: Check the PDB definition status in SAS IT Charge Management
ERROR: PDB administration.
ERROR: SYSPARM=02MAR2000
```

- If no data is available for consolidation, then the process abends with U0096. The data for consolidation comes from the MONTH reduction level of the PDBs with a *Ready* status in SAS IT Charge Management. Reasons there might not be data for consolidation include:

- There was no data for the selected invoice period.
- The data has not been reduced to the MONTH reduction level.
- All charge quantities were missing.
- All charges were 0 (zero).

The following error messages are displayed:

```
ERROR: There is no charge data for the invoice start date
ERROR: you selected. Either that invoice period has had
ERROR: no source data processed into SAS IT Resource Management
ERROR: or no charges were applied to the source data.
ERROR: Check the contents of SAS IT Charge Management data in the
```

```
ERROR: SAS IT Resource Management PDBs.
ERROR: SYSPARM=02MAR2000 Invoice Start Date=01MAR2000
```

Use the System SYSPARM Options

The SYSPARM option is used in SAS IT Charge Management by batch jobs that use the consolidation file as input. The SYSPARM value specifies which consolidation file you want to use. Currently the following action items use SYSPARM:

- ☐ Consolidation
- ☐ To-date consolidation
- ☐ To-date reporting
- ☐ Simple invoices
- ☐ Standard invoices.

The SYSPARM= option specifies a character string that can be passed to SAS programs. The specified character string can be accessed in a SAS DATA step by the SYSPARM() function and can be accessed anywhere in a SAS program by using the automatic macro variable reference &SYSPARM.

These are variations of valid syntax for SYSPARM:

```
Options SYSPARM=autoinvc;

Options SYSPARM=-n;

Options SYSPARM="ddmmmyy";

Options SYSPARM="ddmmmyyyy";
```

In SAS IT Charge Management, the invoice period input is passed as a value of the SYSPARM= option. The value can be provided in several ways. "Autoinvc" is the invoice period whose end of invoice period date is most recent. The "-n", where n is a number, is a relative number. The value "-0" is the current invoice period. The value "-1" is the same as autoinvc. The value "-2" is two invoice periods ago.

The last two values are dates. The difference is whether you specify the year as two or four digits. "dd" is the day; "mmm" is the three character abbreviation for the month, in uppercase; "yy" or "yyyy" is the year. If you choose to specify a date, the date must fall sometime in the invoice period that you intend to use as input to consolidation. The date can be the start of the invoice period, the end of the invoice period, or any date in between. SAS IT Charge Management uses an internal table of invoice periods to determine the invoice period into which the provided date falls.

Edit Charges

Description:

Edit Charges is an interactive facility that enables you to modify existing charges and create zero balance charges. These charges are added to the consolidation file. They do not replace the original charges created during daily processing. They are kept on the consolidation file as additional variables. The distributed invoice has selections to print these additional charges on the invoice.

Location:

From the SAS IT Charge Management main menu, select **Operations ► Edit Charge**

Activation:

See SAS IT Charge Management Reports, “Edit Charges” on page 92.

Currency Exchange

Description:

Currency Exchange enables you to enter the exchange rates for charge currencies and profile currencies. Invoice programs can thus use profile information in order to convert currencies correctly. This feature is used for multi-currency support only.

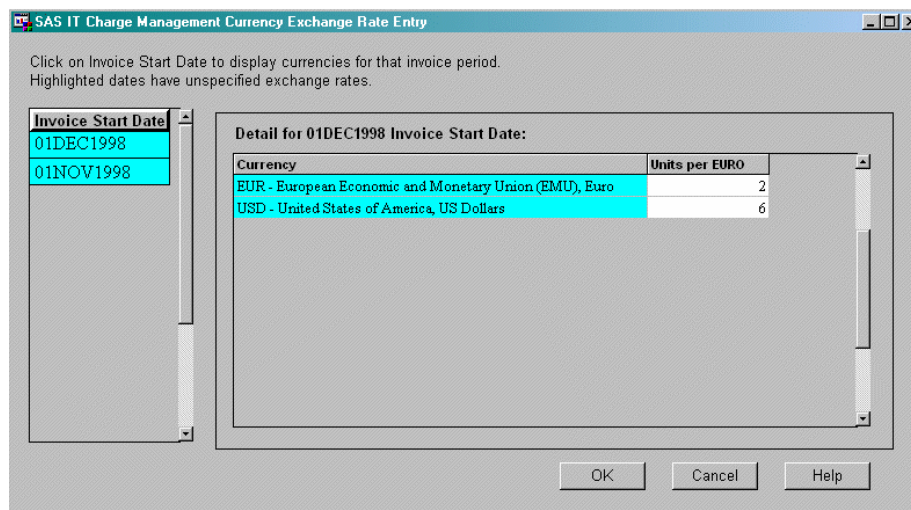
Location:

From the SAS IT Charge Management main menu, select **Operations ► Currency Exchange**.

Activation:

After all profiles are specified and a consolidation or partial consolidation is run, enter the Currency Exchange window. A list of currencies is presented. This list is determined by SAS IT Charge Management from data processed, rate model definitions, and profile information. Provide exchange rates to the Euro from each currency listed. The following steps guide you through this process:

- 1 From the SAS IT Charge Management main menu, select the **Operations** tab. Select **Currency Exchange**.
- 2 The Currency Exchange Rate Entry window appears.



- 3 Invoice periods with missing exchange rates will be highlighted in yellow in the list on the left side of the window.

Missing rates within invoice periods are highlighted in yellow in the list on the right side of the window.

- 4 Verify the exchange rates for each currency from the approved rate reference source. Move the cursor to the cell that represents the exchange rate for the currency you wish to enter or correct. Enter the correct number of units of the associated currency to equal one Euro.
- 5 Select **OK** to accept the change or **Cancel** to return to the Operations menu without accepting any changes.
See “Edit Charges” on page 92.

Run Standard Invoices

Description:

The Run Standard Invoices task generates a batch job or script that creates the standard invoices. This report is available only if you use **Invoice Profiles** and specify **Invoice Formats** for the profiles defined. (See “Customer Profile Information” on page 29.) The generated JCL or script is created using the information that you specified in **Execution Controls**. (For more information on this topic, see “Execution Controls” on page 18.) For each customer, the invoice will be printed as specified in the invoice format associated with that customer’s **Invoice Profile**.

CAUTION:

No invoice will be printed for a customer if no invoice format has been specified for that customer. There is no default invoice format. △

Location:

From the SAS IT Charge Management main menu, select **Operations ► Run Standard Invoices**

Activation:

- 1 On the **Operations** tab, select **Run Standard Invoices**. A generated job or script appears.
- 2 A comment is created in the job or script showing the date and time of generation. Find the date and determine if it is current.
- 3 If the job or script is not current, you can regenerate it by selecting **Regenerate** from the menu bar at the top of the window.
- 4 You can run the job or script by selecting one of the **Submit** options from the menu bar.
- 5 Review the output to verify that the job or script completed successfully.

See also “Simple Invoices” on page 97 and **Invoice Formats** in the section called “Customer Profile Information” on page 29.

Export Data

Description:

Perform this step of Invoice Period End processing after you are satisfied that the consolidation completed successfully. If you have other applications to which you want to export SAS IT Charge Management data, such as Microsoft Excel or a general ledger, now is the time to run the job or script to export the data to a file in the required format. Export Data enables you to edit the job or script generated via the **Open Interface**. Check the job or script, edit it if required, and save it. Then, run the job or script to generate the export file.

Location:

From the SAS IT Charge Management main menu select **Operations ► Export Data**

Activation:

- 1 Select **Operations ► Export Data**. A generated job or script appears.
- 2 Verify that the generation date is current. A comment is created in the job or script showing the date and time of generation. Find the date and make sure it is current.

- 3 If the job or script is not current, you can regenerate it by selecting **Regenerate** from the menu bar at the top of the window.
 - 4 You can run the job or script by selecting one of the **Submit** options from the menu bar.
 - 5 Review the output to verify that it completed successfully.
- See also the Export Data Definitions topic in the section called “Import/Export” on page 42.

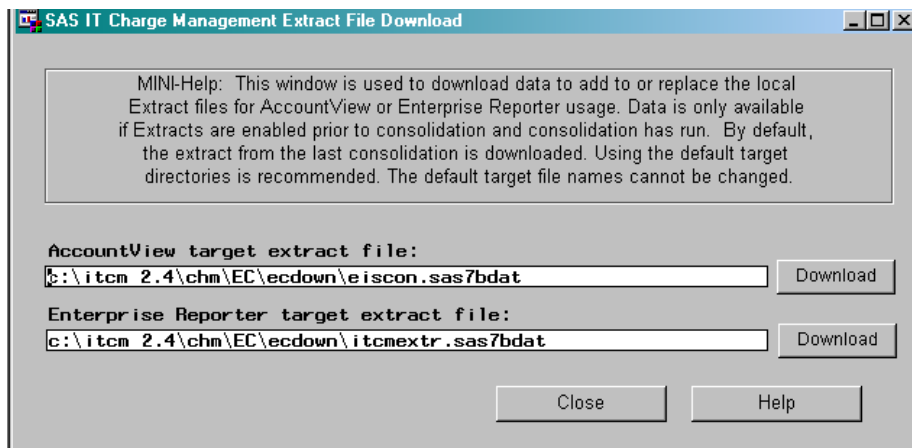
Extract File Download

Description:

Perform this step of Invoice Period End after you are satisfied that the consolidation and the extract creation have completed successfully. The download job copies the selected extract file from the server to the client directory that is specified in a dialog window.

The default directory is automatically used by the AccountView initialization process. If a new extract file is found at the initialization of AccountView, it is copied and processed into AccountView for you. If you decide to change the default directory, you must also change the AccountView autoexec file. This file is located in: **drive:\[SAS Install Path]\cpe\chm\ec\ecav\ecaautoav.sas**. Edit this file to point to the same path as specified in the Extract File download window.

For SAS 8.2 only, the default directory is used by the SAS IT Charge Management for Enterprise Reporter samples that are provided with distribution of SAS IT Charge Management. If you change the location, you must update the Enterprise Reporter info center to point to the new location. For more information, see the Enterprise Reporter documentation.



Location:

From the SAS IT Charge Management main menu, select **Operations ► Extract File Download**

Activation:

- 1 Go to the **Extract File Download** dialog box as described immediately above, in Location.
- 2 Verify that the Target paths and PC files for extract data are correct. The defaults are

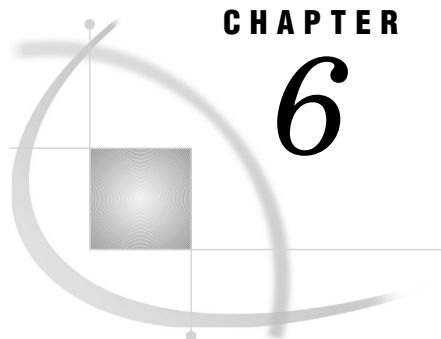
```
drive:\[SAS Install Path]\cpe\chm\ec\ecdown\eiscon.sas7bdat
```

and

```
drive:\[SAS Install Path]\cpe\chm\ec\ecdown\itcmextr.sas7bdat
```

- 3 If the path or PC file is not correct, overwrite the current value with the correct one. (For AccountView, ensure that this path matches the one specified in ecautoav.sas.)
- 4 If the path and PC file are correct, select or to download the file from the server to the client.
- 5 Click to return to the previous window.

See also “Extract Data Setup” on page 50.



CHAPTER

6

Data Exploration and Reporting

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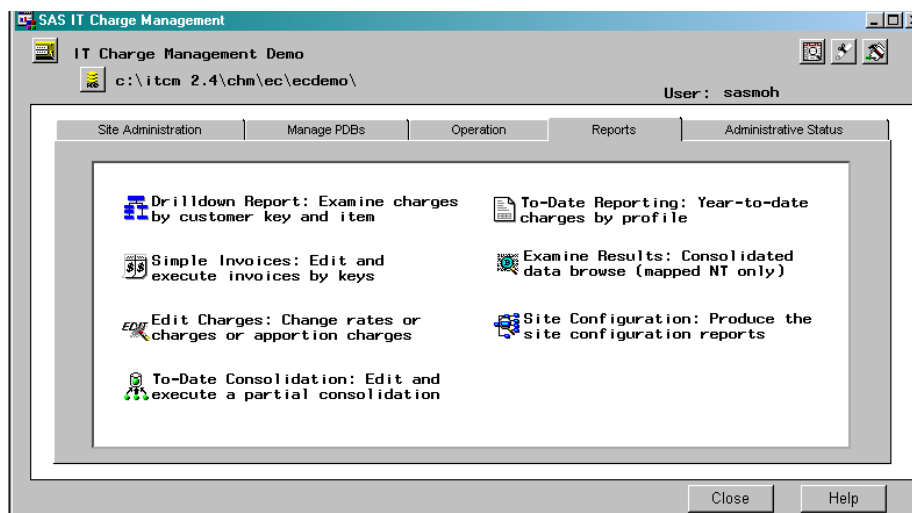
Data Exploration and Reporting: Overview

This section describes the specifics about data exploration and reporting using SAS IT Charge Management. The following topics are included:

- “Report Access” on page 90
- “Data Selection” on page 90
- “Data Exploration” on page 92
- “Simple Invoices” on page 97
- “Ad hoc Reporting” on page 98.
- “Access Your Data with AccountView” on page 106

Report Access

SAS IT Charge Management Reports can be selected from the main menu **Reports** tab. When the SAS IT Charge Management **Reports** tab moves to the front, this window displays:



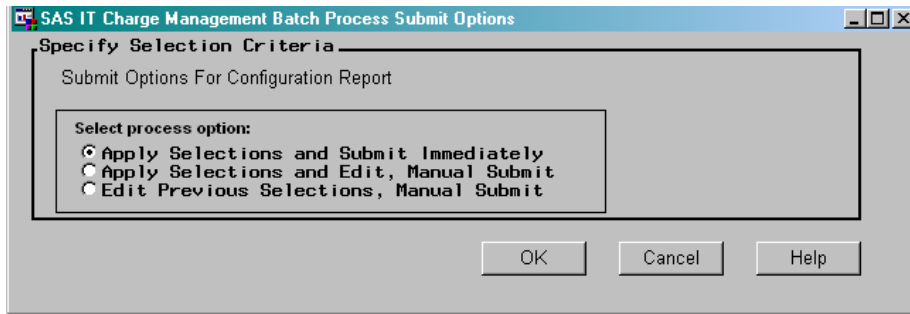
Reports can be interactive or batch. Interactive reports are referred to as Data Exploration. Both the **Drilldown Report** and **Edit Charges** are supplied interactive reports. The **Simple Invoices** are batch reports.

Data Selection

Some Data Exploration, Reporting, and Operational features of SAS IT Charge Management software require that execution options be specified before the feature is executed. There are several decisions to make:

- ☐ Which invoice start date of consolidated data is to be examined or operated upon? Select one by clicking a line in the **Select Invoice Period** list box.
- ☐ Which currency of multiple possible currencies is to be examined or operated upon? Select one by clicking a line in the **Select Currency** list box.
- ☐ Which charges are to be reported; the original, modified or apportioned? Select one by clicking the **Select type of charges to report** radio button.
- ☐ Should rates or charges be edited in consolidated data? Select one by clicking the **Select edit options** radio button.
- ☐ Should batch work be executed immediately, presented in edit first? Select one option by clicking the **Select process options** radio button.

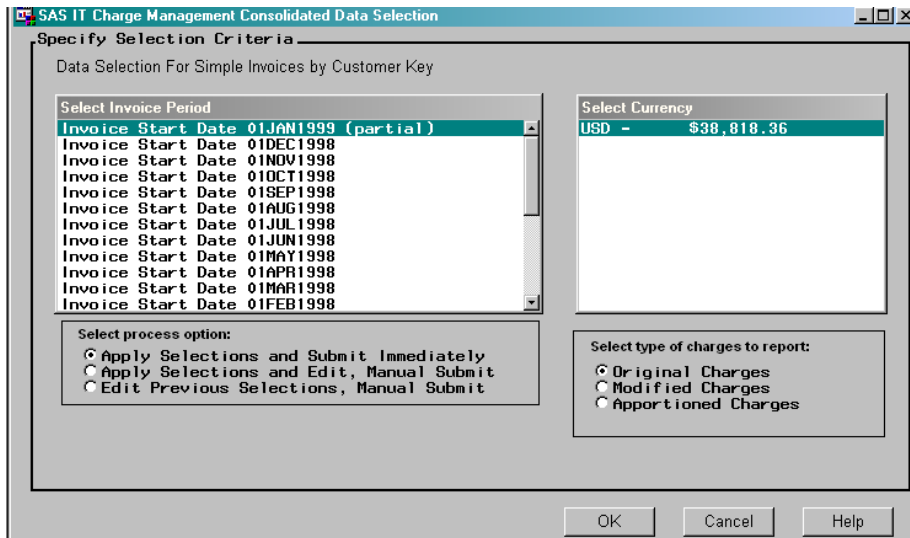
These choices are made by the user from a window whose content changes based on the selected tasks. The following window is an example:



Three choices are available:

- ☐ Execute immediately. Do not show edit dialog box.
- ☐ Show edit dialog box after regenerating.
- ☐ Show edit dialog box but do not regenerate.

As in the case of editing rates or charges, it might be that the invoice start date, currency, and rate or charge edit must be selected. In this case, the frame presented contains these selections:



As in the case of submitting a batch process to produce the Simple Invoices (by customer key), the invoice start date, currency, charge type, and submit or edit options must be selected. The frame presented looks like this:

SAS IT Charge Management Consolidated Data Selection

Specify Selection Criteria

Data Selection For Simple Invoices by Customer Key

Select Invoice Period

Invoice Start Date 01JAN1999 (partial)
Invoice Start Date 01DEC1998
Invoice Start Date 01NOV1998
Invoice Start Date 01OCT1998
Invoice Start Date 01SEP1998
Invoice Start Date 01AUG1998
Invoice Start Date 01JUL1998
Invoice Start Date 01JUN1998
Invoice Start Date 01MAY1998
Invoice Start Date 01APR1998
Invoice Start Date 01MAR1998
Invoice Start Date 01FEB1998

Select Currency

USD	\$36,983.16
-----	-------------

Select process option:

☒ Apply Selections and Submit Immediately
☐ Apply Selections and Edit, Manual Submit
☐ Edit Previous Selections, Manual Submit

Select type of charges to report:

☒ Original Charges
☐ Modified Charges
☐ Apportioned Charges

OK Cancel Help

In other cases, it might be necessary to select some combination of the items above. For example, to execute the Drilldown Report, the invoice start date, currency, and charge type selections are given.

Data Exploration

In SAS IT Charge Management, data exploration refers to the interactive viewing of chargeback data. Data exploration enables you to view the data at different hierarchies, summarization levels, and even with different rates applied. These interactive reports are real time manipulations of copies of your data. The interactive reports do not use batch facilities.

Edit Charges

Edit Charges enables you to modify the rates or charges of existing data. This interactive report uses the consolidation file for a given invoice period. All invoice periods that have been consolidated for this site are available for selection. From the SAS IT Charge Management Reports menu, select **Edit Charges**.

After selecting the invoice period to modify and the type of modification, either the Rate Change Entry window appears:

SAS IT Charge Management Charge Edit

Invoice Start Date: 01JAN1999

Orig Total Charges=\$38,818.36: Modified Total=\$38,818.36

Apportioned \$38,818.36 Last. Apportion New Amt= 38818.36

Click to select the rate to change:

Item	Rate Model	Quantity	Orig Rate	Orig Charge	Mod Rate	Mod Charge	App Rate	A
006020	DEFAULT 19980701	3981	1.50000000	\$5,971.50	1.50000000	\$5,971.50	1.50000000	***
006021	DEFAULT 19980701	6239	2.00000000	\$12,478.00	2.00000000	\$12,478.00	2.00000000	***
500000	DEFAULT 19980701	50922.160087	0.40000000	\$20,368.86	0.40000000	\$20,368.86	0.40000000	***
500001	DEFAULT 19980701	488274.625	0.00000000	\$0.00	0.00000000	\$0.00	0.00000000	***
500004	DEFAULT 19980701	63297.278	0.00000000	\$0.00	0.00000000	\$0.00	0.00000000	***

or the Charge Change Entry window appears:

SAS IT Charge Management Charge Edit

Invoice Start Date: 01OCT1998

Orig Total Charges=\$40,808.24: Modified Total=\$40,808.24

Apportioned \$40,808.24 Last. Apportion New Amt= 40808.24

Click to select the charge to change:

Item	Rate Model	Quantity	Orig Rate	Orig Charge	Mod Rate	Mod Charge	App Rate	A
006009	DEFAULT 19600101	0	0.00000000	\$0.00	0.00000000	\$0.00	0.00000000	
006020	DEFAULT 19980701	4128	1.50000000	\$6,192.00	1.50000000	\$6,192.00	1.50000000	
006021	DEFAULT 19980701	7039	2.00000000	\$14,078.00	2.00000000	\$14,078.00	2.00000000	
500000	DEFAULT 19980701	51345.600058	0.40000000	\$20,538.24	0.40000000	\$20,538.24	0.40000000	
500001	DEFAULT 19980701	407394.502	0.00000000	\$0.00	0.00000000	\$0.00	0.00000000	
500004	DEFAULT 19980701	77559.657	0.00000000	\$0.00	0.00000000	\$0.00	0.00000000	

Any fields that are displayed in white can be modified. SAS IT Charge Management supplies the contents of all other fields. Scrolling to the right displays additional information such as the charge item description, variable, and SAS IT Resource Management table. Charges are shown by charge item for the selected invoice period and currency only.

Note: If you press **OK** from this window, the modified and apportioned charges are saved in the consolidation file and are available for reporting. Modified charges are stored in the variable E1CHRG. Apportioned charges are stored in the variable

E2CHRG. For more information about variables in the consolidation file, see “Variables in the Consolidation Files” on page 120. △

CAUTION:

Since charge and rate edits are only stored in the consolidation files, reconsolidating removes any edits made using this window. △

Drilldown Report

Selecting the Drilldown Report from the SAS IT Charge Management Reports main menu opens a drop-down selection of all invoice periods whose data was processed for this site. Select the invoice period you want to report on. Then, you are prompted for charge selection: original charges applied during processing, modified charges from **Edit Charges**, or zero balance charges from **Edit Charges**. After these selections are completed, the drilldown report is displayed.

The drilldown report shows the selected charges for the selected invoice period by the customer name key variables. They are summarized to the first key value. If there are charges for a lower key value, then an arrow appears next to the line. Click the arrow to expand that section of the report to the next level.

SAS IT Charge Management Drilldown Report		
Click to Expand or Collapse Entry. Selected Currency is USD.		
Invoice Start=01JUL1998.	Grand Total Original Charges=	\$53,128.03
[+] (Unspecified)	: Total=	\$22,939.35
[+] ADVANCED TECHNOLOGY	: Total=	\$8.42
[+] ADVANCED VISUALIZATION	: Total=	\$7.96
[+] APO-ASIA/PACIFIC OPERATIO	: Total=	\$8.38
[+] APPLICATIONS	: Total=	\$78.06
[+] BUSINESS SOLUTIONS DIVISI	: Total=	\$331.12
[+] COMPUTER GRAPHICS	: Total=	\$7.67
[+] CORE DEVELOPMENT	: Total=	\$45.87
[+] DATA CENTER	: Total=	\$1,123.26
[+] DATA WAREHOUSE TECHNOLOGY	: Total=	\$689.45
[+] DISPLAY PRODUCTS DEVELOPM	: Total=	\$10.23
[+] EDUCATION	: Total=	\$104.25
[+] EDUCATION TECHNOLOGIES	: Total=	\$8.16
[+] EXECUTIVE	: Total=	\$653.74
[+] FACILITIES	: Total=	\$65.52
[+] FIN-FINANCE	: Total=	\$686.44
[+] HOST SYSTEMS DEVELOPMENT	: Total=	\$24.20
[+] HSR-ENTERPRISE SERVER TEC	: Total=	\$5,351.98
[+] HSR-HOST SYSTEMS R&D	: Total=	\$1,160.29
[+] HSR-QUALITY ASSURANCE	: Total=	\$207.75
[+] HSR-WORKSTATION TECHNOLOG	: Total=	\$3.26
[+] HUMAN RESOURCES	: Total=	\$183.64

AccountView

AccountView is a SAS/EIS application shipped with SAS IT Charge Management. SAS IT Charge Management AccountView is installed on the same PC as SAS IT Charge Management software during the installation process. It is shipped with demonstration data so that you can launch it immediately after installation. This enables you to review the product before deciding if you want to implement the automatic extraction process during consolidation. Once the consolidation task has extracted the data and you have downloaded it from the host using SAS IT Charge Management, AccountView will automatically pick up the new data.

Seven SAS/EIS applications are included with this version of the product. Three are 3D Business Graphs and four are Multi-dimensional Reports.

Note: If you have any suggestions for SAS/EIS applications, please contact SAS Technical Support. △

How to Make AccountView Drilldown Definitions Reflect Your Customer Key Structure:

After the Extract file has been downloaded to the client and that data is selected from the **Select Table** push button in AccountView (AV), you can report on the newly consolidated data.

Note: When entering any of the report objects inside AccountView, you will see a hierarchy that is not yours and is only two levels deep. For example, your definition might have set 5 E0CUSTn levels, starting from Division going down through Application Group. Instead of seeing your hierarchy, you see the definition from the demonstration data. △

Note: Before you use the AccountView function, you must successfully complete your daily data collections (with the process and reduce functions). △

To utilize the reporting features of AccountView, follow these instructions:

A. Download the Extract file to your client platform.

- 1 Launch SAS IT Charge Management.
- 2 Select a site from the **Site Selection** box and press **Open**. Activate the PDB you want to work with.
- 3 From the Site Administration tab, select **Manage Open Interface ► Extract Data Setup**
- 4 Click the **AV Extract** button so that it displays **AV Extract Enabled**.
- 5 Using the **Shift** key with your cursor, highlight the customer keys you want to explore. Click **OK**.
- 6 From the Operation tab, select **Consolidate Data: Edit and execute the batch consolidation**
- 7 Choose the invoice period you want to consolidate and click the process option *Apply Selections and Submit Immediately*. Click **OK**. After the consolidation job completes, view the log by pressing **Log** on the upper left corner and check for a message to ensure that the file was successfully downloaded.
- 8 Close the window and return to the Operation tab. Select **Extract File Download: Copy the current extract file to your PC**
Press the **Download** button next to the path for the **AccountView target extract file** in order to download the file. If there is no problem with the downloading, a message stating “Download completed successfully” will display at the top of the window.
- 9 Exit ITCM.

B. Prepare the tables you want to work with.

- 1 Launch AccountView.
- 2 From the upper toolbar, select **Window ► Log**
Verify that there is a message that says **Extract file copied from ecdwn.EISCON to ECCON.Cnnnnnnn**, where *nnnnnnnn* is the numeric value of the unformatted SAS date on which the table was copied from ITCM Administrator to ITCM AccountView. Then, minimize the Log window.
- 3 In the AccountView window, click on **Select Table**.
- 4 Use the arrow to the right of the **Repository** field to select **ECCON** as the path.

- 5 Then, use the arrows in the middle of the window to select the table you saw copied (eccon.cnnnnnnnn) and move it from the **Available** list to the **Selected** list. When you are satisfied with your selections, click **OK**.
 - 6 Select **Window ► Log** and then verify that there is a message that says "Note: Selected table copied from ECCON.Cnnnnnnnn to ECCON.CONFILE".
- C. Launch SAS/EIS (Enterprise Information System).
- 1 If you are running SAS 9.1.3 or later, select **Solutions ► Development and Programming ► EIS/OLAP Application Builder**
 - 2 From the SAS/EIS main menu, double-click on the **Metabase** icon.
 - 3 Use the arrow to the right of the **Repository** field to select **ECCON** as the path and then **YTD Consolidation File** from the list of available tables.
 - 4 Select **Columns ► Add ► Table Column**
 - 5 Move the additional customer keys from **Available** to **Selected**. (This registers your additional customer key levels in the YTD Consolidation File.)
 - 6 Select **OK ► CLOSE** to return to the **Metabase** dialog.
 - 7 Highlight the YTD Consolidation File. Select **HIERARCH attribute ► Edit ► Nodes hierarchy**
 - 8 Move the additional customer key fields from **Available** to **Selected**.
 - 9 When you are satisfied, click **OK ► CLOSE ► CLOSE (or minimize) the SAS/EIS main menu**
- D. Explore your reports.
- 1 Select **Revenue by Customer**
 - 2 Double-click on a pie slice that you want to view in more detail.
 - 3 Repeat this drilling down until you reach the level you want to explore, or until you reach the lowest level.
- Note:* Use the arrows in the upper right portion of the window to move back up through the reporting levels of the Revenue display. △

Batch Reports

SAS IT Charge Management provides a facility to run reports in batch mode. If there is a large amount of data with many individual reports to generate, batch reporting is more efficient than interactive reporting. The supplied batch reports include:

- "Simple Invoices" on page 97 (uses customer name keys)
- "Standard Invoices" on page 97 (uses customer profiles)
- "To-Date Reporting" on page 97 (uses customer profiles)
- "Site Configuration Report" on page 98.

Execution Definitions and Destinations

For batch reporting, execution information and the destination of the output are required.

For z/OS servers, JOB cards and JCL execution information must be specified.

For Open Systems servers, a script and login ID must be specified.

For Windows servers, only the location of the SAS executable is required.

The report execution statements are specified under **Site Administration ► Manage Site Defaults and Accounting Calendar ► Execution Controls**. For more information on this topic, see “Execution Controls” on page 18.

Simple Invoices

Description:

SAS IT Charge Management has one simple invoice. This is a batch report generated by SAS IT Charge Management, and it is always available. The generated JCL, script or bat file is created based on the contents of the consolidation file selected and what you specify on the invoice by Customer Key Definition window. You cannot save the layout of the simple invoice. Customer profiles and invoice format definitions are not used in simple invoices. Simple invoices uses the customer name key fields (E0CUST1-9) for invoicing.

Location:

From the SAS IT Charge Management main menu, select **Reports ► Simple Invoices**

Activation:

- 1 On the **Reports** tab, select **Simple Invoices**.
- 2 A window called Consolidated Data Selection appears. Make your selections and press **OK**.
- 3 The next window that opens is called Invoice by Customer Key. This window enables you to specify the report layout. You cannot save the specifications.
- 4 After you fill in all required fields and you press **OK**, a generated job or script opens. You can edit the job or script.
- 5 You can run the job or script by selecting one of the **Submit** options from the menu bar.
- 6 Review the output to verify that the report has completed successfully.

See also “Run Standard Invoices” on page 86 and “Site Configuration Report” on page 98.

Standard Invoices

Standard Invoices are described in “Run Standard Invoices” on page 86.

To-Date Reporting

Description:

The To-Date Reporting task enables you to set up and run a batch report that is generated by SAS IT Charge Management. It uses customer profiles, including budget information. The generated JCL, script, or bat file is based on the execution control statements specified under Site Administration. The report uses year-to-date consolidation tables. If a partial consolidation has been successfully completed, the report has data from the beginning of the year through the day the partial consolidation was run. If a partial consolidation has not been run, the report shows data from the

beginning of the year through the most recently closed invoice period. You must have customer profiles and budgets specified in order to use this report.

Location:

From the SAS IT Charge Management main menu, select **Reports ► To-Date**

Reporting.

Activation:

- 1 From the Reports tab, select **To-Date Reporting**.
- 2 The Consolidated Data Selection window opens. Make your selections and press **OK**.
- 3 A generated job or script appears. You can edit the job or script.
- 4 You can run the job or script by selecting one of the **Submit** options from the menu bar.
- 5 Review the output to verify that the report has completed successfully.

Site Configuration Report

Description:

The Site Configuration task can be used to document your customizations to SAS IT Charge Management. It can also pass information to SAS Technical Support. It generates a report showing all specifications and customizations you have made using the client interface. The report shows what SAS IT Charge Management is using on the server when process, reduce, consolidation and invoices are run.

Location:

From the SAS IT Charge Management main menu, select **Reports ► Site**

Configuration

Activation:

- 1 On the Reports tab, select **Site Configuration**.
- 2 The Consolidated Data Selection window opens. Make your selections and press the **OK**.
- 3 A generated job or script appears. You can edit the job or script.
- 4 You can run the job or script by selecting one of the **Submit** options from the menu bar.
- 5 Review the output to verify that the report has completed successfully.

Ad hoc Reporting

The SAS IT Charge Management charges are collected and summarized daily so that they can be reported from various perspectives. All SAS IT Charge Management files begin with “E”. Each SAS IT Resource Management table in the PDB that is used for charging also has a corresponding SAS IT Charge Management file in the PDB.

All of the variables are available for ad hoc query and reporting. SHIFT is available within DETAIL and any of the above summarization levels. Each non-computed SAS IT Charge Management Charge Item has a direct assignment from a SAS IT Resource Management variable. To determine the charge item number assigned to a variable, see “Manage Charge Item Definitions” on page 33.

The SAS IT Charge Management files are SAS data sets. The charges are collected and summarized daily so that they can be reported from various perspectives. The process and reduce steps collect data and create tables in the SAS IT Resource

Management data warehouse (PDB). These tables begin with the letter "E". The rest of the table name is the same as the SAS IT Resource Management name without the leading "X" or "U". For example, the SAS IT Resource Management table XPRINT will have a SAS IT Charge Management "sister" table called EPRINT. By default, all SAS IT Charge Management tables in the PDB are kept in the DETAIL and MONTH level libraries only. All SAS IT Charge Management tables in the PDB contain the same variables. For more information on the variables in these tables, see "File Structures: Overview" on page 118.

SAS IT Charge Management also has consolidation tables. These tables are not located in the PDB. Instead they are located in a SAS IT Charge Management library called `siteprefixpath\EC\DATA`. This library is located on the server. The consolidation tables contain a summary of all month level tables for all PDBs in the site. The consolidation tables contain many of the same variables as the "E" tables in the PDB. They also contain additional variables such as Modified Charges, Modified Rate, Apportioned Charges and Apportioned Rate.

Note: For more information on the variables in the consolidation files, see "Variables in the Consolidation Files" on page 120.

For more information on the variables in the PDB "E" tables, see "Variables in the PDB "E" Tables Files" on page 120. △

CAUTION:

Because observations in the tables represent various charge items, quantity cannot be summarized across charge items, unless those charge items represent the same resource and unit of measurement. For example, you cannot directly summarize quantities for CPU time if one record stores CPU time in seconds and another stores it in nanoseconds. △

All of the variables are available for ad hoc query and reporting. Each non-computed SAS IT Charge Management charge item has a direct assignment from a SAS IT Resource Management variable. To determine the charge item number assigned to a variable, see "Manage Charge Item Definitions" on page 33.

Descriptions of variables include associations of any formats with those variables. To refer to descriptions of the SAS formats used with SAS IT Charge Management, see "SAS IT Charge Management Formats" on page 101.

How to Create Ad hoc Reports

At this time, there are three ways to create ad hoc reports using SAS IT Charge Management data:

- You can create your own reports by writing your own SAS code and using the SAS IT Charge Management tables as input. You can assign the tables using a LIBNAME statement and use SET or MERGE statements to use the data for your report. Before writing reports, you might want to browse the tables to see what your data looks like. You have the full suite of SAS System reporting procedures available.
- You can use the templates and reports supplied in Enterprise Reporter. For information on this topic, see "Use SAS IT Charge Management Data with Enterprise Reporter" on page 100.
- You can use the Manage Report Definitions action item in SAS IT Resource Management. For information on this topic, see "Create Reports Using SAS IT Resource Management" on page 105.

Use SAS IT Charge Management Data with Enterprise Reporter

Note: The information in the following topics about Enterprise Reporter applies to IT Charge Manager 2.3 (which is an earlier version of SAS IT Charge Management that runs on SAS 8.2) and Enterprise Reporter 2.5 that runs on SAS 8.2 only.

Information about SAS IT Charge Management 2.4 with Enterprise Reporter 2.6 will be available at the following location: <http://support.sas.com/documentation/onlinedoc/chargemanager/>. △

Extract Data from SAS IT Charge Management - Overview

SAS IT Charge Management creates two data extracts: AV and ER. The AV extract file is used as input to SAS IT Charge Management AccountView. The ER extract file is used as input to an Enterprise Reporter infolder. The following topics discuss the creation, contents and use of the ER extract file. Basic knowledge of SAS IT Charge Management and Enterprise Reporter is assumed.

SAS IT Charge Management creates an extract file that can be read by Enterprise Reporter. The extract file is a SAS data set that is produced during the consolidation process. It combines the data from the consolidation file with the information in the invoice profiles. The extract file resides on the server and is replaced each time the consolidation job runs. You can download the extract file from the server using the SAS IT Charge Management client interface.

The following topics explain how you can create and download an extract file as well as how to launch Enterprise Reporter and set up the report. In addition, there are instructions on how to install the Enterprise Reporter InfoFolder for SAS IT Charge Management data. It also discusses the data structure and the format of the extract file.

If you need any additional information about Enterprise Reporter, refer to the Enterprise Reporter User's Guide.

Set up the Extract File

To enable the ER extract file creation, complete the following steps:

- 1 From the SAS IT Charge Management main menu, select the Site Administration tab.
- 2 Then select Manage the Open Interface.
- 3 Next select Extract File Setup.
- 4 Press the button that is to the right of the window labeled ER Extract Enabled. This button toggles between *ER Extract Enabled* and *ER Extract Disabled*. If you want to create the extract file, select the button so that it shows *ER Extract Enabled*. If you do not want to create the extract file, select the button so that it shows *ER Extract Disabled*.
- 5 Press OK to save your specifications, or Cancel to return to the previous specifications.

Extract File and Format Definitions

The ER Extract File is a SAS data set created during the consolidation process. It combines the data from the consolidation file with the information in the invoice profiles. This file is replaced on the server each time the consolidation is run.

Create the Enterprise Reporter Extract File

To create the Enterprise Reporter extract file, complete the following steps:

- 1 Run one or more data collection jobs (%CxPROCES, %CPREDUCE).
- 2 Run a partial or full consolidation. The consolidation job will create the extract file on the server.

Variables in the ER Extract File

This section lists the variables available in the ER Extract File, contains definitions of the variables, and discusses the SAS IT Charge Management Formats for ER.

The list below has links to descriptions of all the variables on the ER Extract File.

CHGFMT“CHGFMT” on page 121
 CIDESC“CIDESC” on page 121
 CUSFMT“CUSFMT” on page 122
 CUST0CHG“CUST0CHG” on page 123
 CUST1CHG“CUST1CHG” on page 124
 CUST2CHG“CUST2CHG” on page 124
 CUSTCURR“CUSTCURR” on page 122
 CUSTORG“CUSTORG” on page 123
 DATETIME“DATETIME” on page 125
 E0CCURR“E0CCURR” on page 128
 E0CHRG“E0CHRG” on page 130
 E0CITEM“E0CITEM” on page 131
 E0CQTY“E0CQTY” on page 131
 E0CRATE“E0CRATE” on page 132
 E0CTYPE“E0CTYPE” on page 133
 E0CUST_n (where $n=1$ to 9)“E0CUST_n (where $n=1$ to 9)” on page 133
 E0ENDTM“E0ENDTM” on page 134
 E0INVSD“E0INVSD” on page 135
 E0MONTH“E0MONTH” on page 135
 E0RMDL“E0RMDL” on page 136
 E0STRTM“E0STRTM” on page 136
 E0YEAR“E0YEAR” on page 137
 E1CHARGE“E1CHARGE” on page 137
 E1CRATE“E1CRATE” on page 138
 E2CHRG“E2CHRG” on page 138
 E2CRATE“E2CRATE” on page 139
 MACHINE“MACHINE” on page 139
 SHIFT“SHIFT” on page 140

SAS IT Charge Management Formats

SAS formats are built and used by SAS IT Charge Management. These formats are created by the consolidation process and are rebuilt on the server each time you run the consolidation. They are stored in ECSITE.ECUSER on the server. If you download the extract file, the format catalog is downloaded, too. (For information on this topic, see “Extract File Download” on page 87.) By default, the format catalog is downloaded to drive: \[**SAS install path**]\cpe\chm\ec\ecdown\formats.sas7bcat.

This table lists the format names and their descriptions.

Table 6.1 Table of Format Names and Descriptions

Format Name	Format Description
\$CIDESC	Returns description of Charge Item when given the Charge Item Number.
\$CITAB	Returns the SAS IT Resource Management table used for charging when given the Charge Item Number.
\$CURDESC	Translates the 3-letter currency code into a description, that is, 'BRL' = 'Brazil, Brazilian Real'.
\$CURRFMT	Translates the 3-letter currency code into a display format name. SAS IT Charge Management distributed SAS formats include the following: 'DEM' = 'currdem.' 'EUR' = 'euro15.2' 'GBR' = 'currgrbr.' 'IEP' = 'curriep.' 'JPY' = 'currjpy.' 'NZD' = 'currnzd.' 'PTE' = 'currpte.' 'USD' = 'dollar15.2' other = '15.2'.
\$CURLONG	Translates the 3-letter currency code into a composite string, that is, 'BRL' = 'BRL - Brazil, Brazilian Real'.
\$ECTYPE	Returns the description of the type of charges (E0CTYPE) within SAS IT Charge Management: 0000= 'Regular Charges' 0100= 'CPU Normalization Charges' 0200= 'Shift Differential Charges' 0400= 'Direct Data Load Charges' 0500= 'Import Data Charges' 9800= 'Credit Charges' 9900= 'Debit Charges'
\$MNTHNM	Month or Period names; defaults to Gregorian calendar month names.
\$SHIFT	Shift Names as defined in SAS IT Resource Management.
CURRDEM	Defines how to display charges when given the currency code of DEM, Germany, Deutsche Mark: low-<0='000.000.009,99DM'(mult=100 prefix='-') 0-high='000.000.009,99DM'(mult=100)

Format Name	Format Description
CURRGBR	Defines how to display charges when given the currency code of GBP, Great Britain, Pound Sterling: low-<0='000,000,009.99-'(prefix='£') 0-high='000,000,009.99'(prefix='£')
CURRIEP	Defines how to display charges when given the currency code of IEP, Ireland (Eire), Punt: low-<0='000,000,009.99 IEP'(prefix='-') 0-high='000,000,009.99 IEP'
CURRJPY	Defines how to display charges when given the currency code for JPY, Japan Yen: low-<0='000,000,009.99-'(prefix='¥') 0-high='000,000,009.99'(prefix='¥')
CURRNZD	Defines how to display charges when given the currency code of NZD, New Zealand, dollar: low-<0='000,000,009.99NZ'(prefix='-\$') 0-high='000,000,009.99NZ'(prefix='\$')
CURRPTE	Defines how to display charges when given the currency code of PTE, Portugal, Escudo: low-<0='000,000,009\$99-'(mult=100) 0-high='000,000,009\$99'(mult=100)

Get the Data and Formats to Enterprise Reporter

Download the Extract File and Formats

Download the extract files after you are satisfied that the consolidation and the extract creation have completed successfully. The download task copies the extract file from the server to the client directory that is specified in a dialog window.

Note: Before you can download the extract file, you must first install the Enterprise Reporter InfoFolder. △

- 1 From the SAS IT Charge Management main menu, select the Operations tab.
- 2 Select **Extract File Download**.
- 3 Verify that the target paths and PC files for extract data are correct. The defaults are:

```
SAS 8.2
For AccountView:
drive:\[SAS install path]\cpe\chm\ec\ecdown\eiscon.sas7bdat
For Enterprise Reporter:
drive:\[SAS install path]\cpe\chm\ec\ecdown\itcmerxtr.sas7bdat
```

- 4 If either path or PC file is not correct, overwrite the current value with the correct one.
- 5 If both the paths and the PC files are correct, select **Download** to download the file from the server to the client.

- 6 Click to return to the previous window.

Update the SAS IT Charge Management InfoFolder with Your Data

The following checklist shows how to use the Enterprise Reporter InfoFolder for SAS IT Charge Management data. These instructions enable you to have multiple SAS data sets using the same InfoFolder. All the files will have the same structure and can be combined to create quarterly or year-to-date reports.

- 1 Copy the extract file (itcmextr.sas7bdat or itcmextr.sd2) from drive: `\[SAS install path]\cpe\chm\ec\ecdown` to drive: `\[SAS install path]\Business\`.
- 2 Copy the format catalog (formats.sas7bcat or formats.sc2) from drive: `\[SAS install path]\cpe\chm\ec\ecdown` to drive: `\[SAS install path]\Business\`.
- 3 Launch Enterprise Reporter.
- 4 Click to close the Report Gallery and return to the previous window.
- 5 From the menu bar select **Tools ► Manage InfoFolders**
- 6 From the User tab, select **SAS IT Charge Management Data**.

Note: This should be the only InfoFolder. △

- 7 Right click and select from the drop-down menu. The InfoFolder is now updated with the new data.
- 8 Click on .
- 9 Select the SAS IT Charge Management tab.
- 10 Select a report.

Instructions for Installing the ITCM 2.3-ER 2.5 files on SAS 8.2

The following checklist shows how to install the Enterprise Reporter InfoFolder for SAS IT Charge Management data. These instructions allow you to have multiple SAS data sets using the same InfoFolder. All the files will have the same structure and can be combined to create quarterly or year-to-date reports.

- 1 Ensure that your SAS release is at SAS 8.2.
- 2 Use a text editor to edit drive: `\[SAS install path]\cpe\chm\ec\ER8\ER8COPY.BAT`. At the top of the file, you will see three locations to specify for your environment.
- 3 Specify the locations and save the changes.
- 4 Execute the batch file, **ER8COPY.BAT**. It will copy the files from SAS IT Charge Management to Enterprise Reporter. The table below lists the files and the locations to which they are copied.
- 5 After **ER8COPY.BAT** completes, launch Enterprise Reporter using an administrator logon id.
- 6 If the Report Gallery is displayed, click and then to close it.
- 7 From the menu bar select **Tools ► Manage InfoFolders**
- 8 From the User tab, select the SAS IT Charge Management Data InfoFolder.

Note: This should be the only InfoFolder displayed. △

- 9 Right click and select **Update** from the drop-down menu.

Note: This selection will be grayed out unless you used an administrator logon id to access Enterprise Reporter. △

10 Click [Report Gallery](#).

11 Select the SAS IT Charge Management tab.

12 Select a report. You can now review reports. They will be populated with data from the demonstration Enterprise Reporter extract file that is supplied with SAS IT Charge Management.

The script, **ER8COPY.BAT**, copies SAS IT Charge Management 2.3 Sample Data and Reports to Enterprise Reporter. It contains the three variables which must be updated to point to your installation directories. The variables (listed below) are used in the following table. The table shows the installation files and locations which they are copied to.

_ITCMLOC is the directory where SAS IT Charge Management has been installed.

_ERLOC is the directory where Enterprise Reporter has been installed.

_USERLOC is the user directory for Enterprise Reporter InfoFolders.

Note: This user directory should be the same as the one found in the admin.ini file under the Enterprise Reporter installation path. It should be similar to

drive:\[SAS install path]\Business\admin.ini. △

Table 6.2 Installation Files and Locations

Name:	File or Folder:	Is Copied To:
[_ITCMLOC]\EC\ER8\SAS IT Charge Management	Folder	[_ERLOC]\Gallery\SAS IT Charge Management
[_ITCMLOC]\EC\ER8\SAS IT Charge Management Data	Folder	[_USERLOC]\SAS IT Charge Management
[_ITCMLOC]\EC\ER8\SAS IT Charge Management Data.ERD	File	[_USERLOC]
[_ITCMLOC]\EC\ER8\ITCM	Folder	[_ERLOC]\demodata\ITCM
[_ITCMLOC]\EC\ER8\autoexec.sas	File	[_ERLOC]
[_ITCMLOC]\EC\ER8\SAS.bmp	File	[_ERLOC]\Demodata\Clipart

Create Reports Using SAS IT Resource Management

Because the SAS IT Charge Management tables in the PDB are SAS IT Resource Management tables, SAS IT Resource Management reporting can be used with them. Before you generate reports in SAS IT Resource Management, you have to determine your report design:

Do you want a graph or tabular report?

What information should be included?

Once you have determined your design, you can go into the SAS IT Resource Management client and select a PDB to report from. The PDB must be the active PDB. The PDB can either be local to the client or on a remote server.

Go to the SAS IT Resource Management Manage Report Definitions tab. You can customize a report definition based on a supplied report definition or you can create

your own report definition. You can save the report definition in interactive form or save the macro code for batch processing.

Access Your Data with AccountView

To utilize the reporting features of AccountView, follow the instructions to:

- 1 “Download the Extract File to Your Client Platform” on page 106
- 2 “Prepare the Tables You Want to Work With” on page 106
- 3 “Launch SAS/EIS (the Enterprise Information System)” on page 107
- 4 “Explore Your Reports” on page 107

Note: Before you use the AccountView function, you must successfully complete your daily data collections (with the process and reduce functions). △

Download the Extract File to Your Client Platform

- 1 Launch SAS IT Charge Management.
- 2 Select a site from the **Site Selection** box and press **Open**. Activate the PDB you want to work with.
- 3 From the Site Administration tab, select **Manage Open Interface ► Extract Data Setup**.
- 4 Click the **AV Extract** button so that it displays **AV Extract Enabled**.
- 5 Using the **Shift** key with your cursor, highlight the customer keys you want to explore. Click **OK**.
- 6 From the Operation tab, select **Consolidate Data: Edit and execute the batch consolidation**.
- 7 Choose the invoice period you want to consolidate and click the process option *Apply Selections and Submit Immediately*. Click **OK**. After the consolidation job completes, view the log by pressing **Log** on the upper left corner and check for a message to ensure that the file was successfully downloaded.
- 8 Close the window and return to the Operation tab. Select **Extract File Download: Copy the current extract file to your PC**.
Press the **Download** button next to the path for the **AccountView target extract file** in order to download the file. If there is no problem with the downloading, a message stating “Download completed successfully” will display at the top of the window.
- 9 Exit ITCM.

Prepare the Tables You Want to Work With

- 1 Launch AccountView.
- 2 From the upper toolbar, select **Window ► Log**.
Verify that there is a message that says **Extract file copied from ecdwn.EISCON to ECCON.Cnnnnnnn**, where *nnnnnnn* is the numeric value of the unformatted SAS date on which the table was copied from ITCM Administrator to ITCM AccountView. Then, minimize the Log window.

- 3 In the AccountView window, click on **Select Table**.
- 4 Using the arrow to the right of the **Repository** field, select **ECCON** as the path.
- 5 Then, using the arrows in the middle of the window, select the table you saw copied (econ.cnnnnnnnn) and move it from the **Available** list to the **Selected** list. When you are satisfied with your selections, click **OK**.
- 6 Select **Window ► Log** and then verify that there is a message that says "Note: Selected table copied from ECCON.Cnnnnnnnn to ECCON.CONFILE".

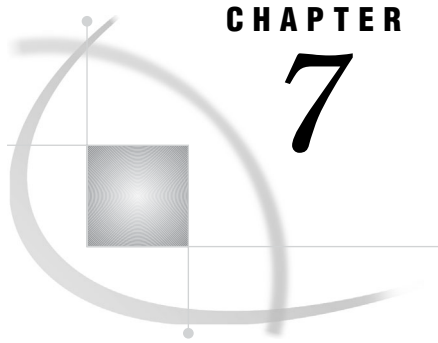
Launch SAS/EIS (the Enterprise Information System)

- 1 If you are running SAS 9.1.3 or later, select **Solutions ► Development and Programming ► EIS/OLAP Application Builder**
- 2 From the SAS/EIS main menu, double-click on the **Metabase** icon.
- 3 Using the arrow to the right of the **Repository** field, select **ECCON** as the path and then **YTD Consolidation File** from the list of available tables.
- 4 Select **Columns ► Add ► Table Column**
- 5 Move the additional customer keys from **Available** to **Selected**. (This registers your additional customer key levels in the YTD Consolidation File.)
- 6 Select **OK ► CLOSE** to return to the **Metabase** dialog.
- 7 Highlight the YTD Consolidation File. Select **HIERARCH attribute ► Edit ► Nodes hierarchy**
- 8 Move the additional customer key fields from **Available** to **Selected**.
- 9 When you are satisfied, click **OK ► CLOSE ► CLOSE (or minimize) the SAS/EIS main menu**

Explore Your Reports

- 1 Select **Revenue by Customer**
- 2 Double-click on a pie slice that you want to view in more detail.
- 3 Repeat this drilling down until you reach the level you want to explore, or until you reach the lowest level.

Note: Use the arrows in the upper right portion of the window to move back up through the reporting levels of the Revenue display. △



CHAPTER

7

Administrative Status

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Use SAS IT Charge Management Administrative Status 109

Administrative Status: Overview

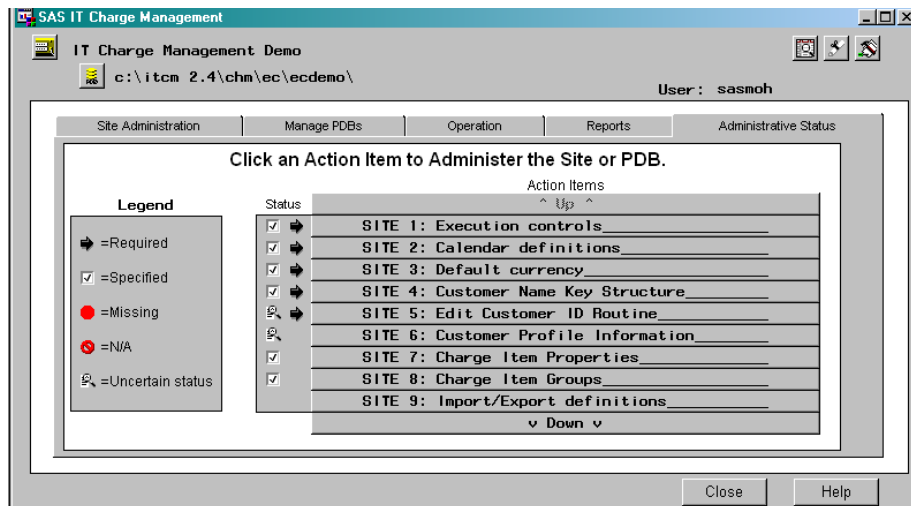
The Administrative Status tab enables you to determine the status of action items that pertain to a PDB or to a site. You can also perform all administrative tasks for the selected PDB or the site by selecting the task from a list that opens when you click on the Administrative Status tab. After the task is selected, you are taken directly to the windows needed to complete that task.

This section describes how to use the SAS IT Charge Management Administrative Status window.

Note: All administrative tasks can be performed from the Administrative Status tab of the SAS IT Charge Management client interface. △

Use SAS IT Charge Management Administrative Status

To use the Administrative Status window, select the Administrative Status tab from the SAS IT Charge Management main menu.



The **Action Items** sub-menu displays a list of site-related tasks and PDB-related tasks that you can perform. A performance data warehouse (PDB) must be selected to use Administrative Status. After a PDB is selected, a list of action items is displayed. This checklist shows the tasks that can be used to customize a SAS IT Charge Management site. Select an action item with the left mouse button in order to go directly to the specific task. The items are listed in sequence.

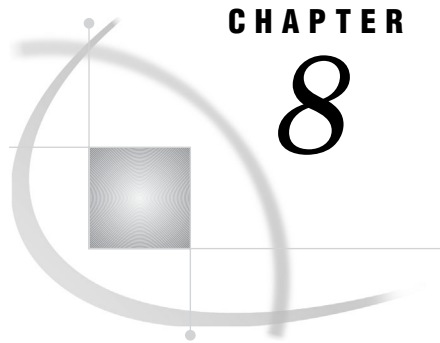
If a new site is being specified, a red "stop sign" appears next to the action item that is labeled *Execution Controls*. When you select the first action item, **Execution Controls**, the window that is used to make that specification appears. Once the entry has been made and **OK** is pressed, you are returned to the list of action items to perform the next task. A check mark appears next to the first action item indicating that the execution controls have been specified.

There are additional action items that are PDB-specific. By following each of these items in order, you can see the steps that need to be taken to ensure a successful implementation. Each of these items can be found from other tabs on the SAS IT Charge Management client interface, but Administrative Status provides a central location that can be used to access the action items directly.

The **Legend** shows the possible status of action items that can be performed against the site and PDB:

Table 7.1 Table of Legends

Legend Item	Description
Required	This Legend item is placed next to an action item that is required for SAS IT Charge Management to work. There are no default values for a required action item. A specification is mandatory.
Specified	This Legend item shows which action items have been specified. It does not indicate if the specification is valid, only that the specification was made.
Missing	This Legend item indicates that an action item is not specified.
N/A	N/A means "Not Applicable" to this site or PDB. An example is the specification of JCL statements for a site that uses UNIX or Windows for the server host.
Uncertain Status	Uncertain Status displays when SAS IT Charge Management cannot determine whether an action item is specified.



CHAPTER

8

Maintenance

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Maintenance: Overview

This section discusses maintenance issues and user modifications.

Periodic Maintenance Application

Maintenance for SAS IT Charge Management is available periodically. Maintenance includes new features, enhancements, updates, and fixes. Late-breaking information on SAS IT Charge Management, tips and hints, FAQs (frequently asked questions), and customer feedback can be obtained from the *SAS IT Management Solutions* section on the SAS Web site, www.sas.com.

SAS IT Charge Management maintenance is available on PC-readable media. An overview of the maintenance along with the appropriate documentation accompanies the shipment. The SETUP utility on the maintenance distribution medium prompts you to fill in the required information for the maintenance software to be downloaded. It also refers you to the checklist or \$README file as needed.

Run Setup for SAS IT Charge Management Maintenance

- 1 Start Windows.
- 2 Insert the SAS IT Charge Management distribution media into the appropriate drive.
- 3 Start the SETUP program for SAS IT Charge Management by selecting **START ► SETTINGS ► CONTROL PANEL ► Add/Remove Programs ► Install**

- 4 Follow the prompts.

Related Software Maintenance Effects

SAS IT Charge Management works closely with several other products. Therefore, updates to these products can have an effect on SAS IT Charge Management. The following sections explain the relationships among the various products and offers precautions where appropriate.

SAS Software

SAS IT Charge Management uses only Base SAS software products (including the macro language facility) and SAS/CONNECT on the z/OS, UNIX and Windows servers. In general, applying ZAPs to the server SAS libraries should not cause any problems for SAS IT Charge Management. However, before you upgrade to an entirely new version of Base SAS software, contact SAS Technical Support to verify that SAS IT Charge Management has been tested with the new version.

- *The SAS System for Windows*

SAS IT Charge Management uses many SAS products on the PC. Always contact SAS Technical Support to verify the effect that changes to the SAS System for Windows can have on SAS IT Charge Management.

SAS IT Resource Management

SAS IT Charge Management is an add-on to SAS IT Resource Management software. Changes in SAS IT Resource Management's exit points or processing macros are likely to affect SAS IT Charge Management. Always contact SAS Technical Support to verify the effects that changes to SAS IT Resource Management can have on SAS IT Charge Management.

- *SAS IT Resource Management for z/OS*

Changes to JCL or procedures for the process and reduce tasks or for CPDDUTL can affect SAS IT Charge Management. In SAS IT Charge Management, update Execution Controls; then, regenerate JCL.

- *SAS IT Resource Management for Open Systems*

Changes to scripts for the process and reduce tasks or for CPDDUTL processing are likely to affect SAS IT Charge Management. In SAS IT Charge Management, update Execution Controls; then, regenerate your scripts.

- *SAS IT Resource Management for Windows*

Changes to scripts for the process and reduce tasks or for CPDDUTL processing are likely to affect SAS IT Charge Management. In SAS IT Charge Management, update Execution Controls; then, regenerate your scripts.

SAS/CONNECT

To exchange data between the host and client, SAS IT Charge Management uses SAS/CONNECT. Most often this is accomplished using PROC UPLOAD or PROC DOWNLOAD. Changes to your network will probably require changes to your logon script. Contact SAS Technical Support to verify how changes to SAS/CONNECT affect SAS IT Charge Management.

MXG

Changes to MXG can directly affect your charges. On z/OS, MXG processes the raw SMF records into SAS files. Your charges are affected if MXG changes either the staging or the location of the element being charged. If you are unsure of the MXG element used for a charge item, open the SAS IT Charge Management Charge Item Definitions and look at the charge items you use. (See “Manage Charge Item Definitions” on page 33.) If the variable name for the charge item number begins with a C_, then it is a computed charge item. Select the charge item, and edit the computation routine to view all elements involved in the calculation of the charge. If the charge item’s SAS IT Resource Management table is created by MXG, the element names are the MXG element names. Check each charge item or its computation routine against your list of MXG changed elements.

User Modifications

User modifications can be installed by the SAS IT Charge Management Administrator or by a consultant. Be sure to keep thorough and accurate records of any user modifications.

SAS IT Resource Management Exit Points

SAS IT Charge Management utilizes some of the SAS IT Resource Management exit points that are available in the %CxPROCES macro. The %CxPROCES macro has an EXITSRC= parameter whose value can be specified in the form *libref.catalog_name*, where *libref* is a pointer to a SAS library and *catalog_name* is a SAS catalog in that library. The catalog contains one or more modules that run at %CxPROCES exit points. The name of each module matches the name of the exit point at which it runs.

The following table shows the names of the modules in ECSITE.ECEXITS and the complete contents of each module:

Table 8.1 Table of Modules in ECSITE.ECEXITS

Module	Contents	Comments
PROC100	%EC_X100;	
PROC135	%EC_X135	See note.
PROC200	%EC_X200;	
PROC205	%EC_X205;	
PROC230	%EC_X230;	

Note: For more information on the use of semicolons, see “Trailing Semicolons” on page 115. △

In the first call to %CxPROCES in the daily job, each call in ECEXITS is used at the exit point in %CxPROCES that matches its name. Each macro call resolves to an exit routine that is installed as part of SAS IT Charge Management. Logic in the SAS IT Charge Management exit code invokes SAS macros. The macros load when the following statement executes: **%INCLUDE SCNTL(ECSTART);**

These macros resolve only if accounting is active for the table being processed. SAS IT Charge Management activates accounting for a SAS IT Resource Management table if a charge item in the Charge Item table is defined to use a variable from the SAS IT Resource Management table and if the active (ACT) check box of the charge item is checked.

This table shows the ECSITE.ECEXITS2 entries and their contents:

Table 8.2 Table of Modules in ECSITE.ECEXIT2

Module	Contents	Comment
PROC095	%ES_X095	No semicolon is used - see note below
PROC225	%ES_X225;	
PROC230	%ES_X230;	

Note: For more information on the use of semicolons, see “Trailing Semicolons” on page 115. \triangle

In the second call to %CxPROCES in the daily job, each call in ECEXITS2 is used at the exit point in %CxPROCES that matches its name. Each call resolves to an exit routine that is installed as part of SAS IT Charge Management. The macros load when the statement **%INCLUDE SCNTL(ECSTART)** executes. These macros only resolve when SAS IT Charge Management tables are processed.

The setup at your site can fall into one of these three cases.

Note: The %CxPROCES macro call in the original (SAS IT Resource Management only) daily job becomes the first of two %CxPROCES macro calls in the revised (SAS IT Resource Management and SAS IT Charge Management) daily job. \triangle

□ *Case #1:*

SAS IT Resource Management does not use any of the %CxPROCES exit points. To process data in a way that SAS IT Charge Management can also make use of it, you or the IT Resource Management administrator needs to do the following.

- 1 In the first %CxPROCES macro call in the daily process and reduce job, set **EXITSRC=ECSITE.ECEXITS**, where ECSITE is a predefined libref that points to a IT Charge Management library and ECEXITS is one of the catalogs in that library.
- 2 In the second %CxPROCES macro call in the daily process and reduce job, set **EXITSRC=ECSITE.ECEXITS2**, where ECSITE is the same libref as above and ECEXITS2 is another of the catalogs in that library.
- 3 You do not need to do anything more for the exit points.

Note: In the library to which ECSITE points, the modules in the catalogs contain 8- or 9-character strings. The strings are macro calls, with or without trailing semicolons. \triangle

□ *Case #2:*

SAS IT Resource Management uses some %CxPROCES exit points, but none of them are the ones for which modules are supplied in ECSITE.ECEXITS.

- 1 Merge the IT Resource Management modules and the first set of IT Charge Management modules (the ECEXITS modules) into the same catalog and set EXITSRC= to point there.

Example: Suppose IT Resource Management uses the PROC080 exit to create derived variables (by the method in use in prior releases of the

software). The (first) %CxPROCESS macro has EXITSRC=*mylibrary.myexits*, where *mylibrary* is a libref that points to a library that has a catalog named *myexits*, which has an entry named PROC080.

You need to combine the SAS IT Resource Management entries and SAS IT Charge Management entries in the same catalog, because the EXITSRC= parameter can have only one value. Because the EXITSRC= parameter already points to *mylibrary.myexits*, you can create (copies of) the SAS IT Charge Management entries in that library. You can use the SAS program editor or any other text editor (such as ISPF edit) to create your entries.

Be sure to name the modules exactly as shown in the first table above, the ECEXITS table, and type their 8- or 9-character contents exactly as shown in that table.

2 Same as Case #1.

3 Same as Case #1.

□ Case #3:

SAS IT Resource Management uses some %CxPROCESS exit points, and at least one of them is supplied in ECSITE.ECEXITS.

1 Merge the contents of the same-named entries and merge the SAS IT Resource Management entries and the remaining entries in the ECEXITS into the same catalog and set EXITSRC= to point there.

Example: Suppose there is a PROC200 entry in the catalog used by SAS IT Resource Management and in the ECEXITS catalog. Other conditions exist as described in Case #2.

You need to append the contents of the IT Charge Management entry to the contents of the IT Resource Management entry.

Because you are going to use the IT Resource Management catalog, edit the contents of the IT Resource Management entry: append the character string %EC_X200; at the end of the IT Resource Management entry.

Create the remaining IT Charge Management entries from ECEXITS in the IT Resource Management catalog, as described in Case #2.

2 Same as Case #1.

3 Same as Case #1.

Trailing Semicolons

Some macro references in SAS IT Resource Management exits do not have a trailing semicolon and some others do have a trailing semicolon. Using a semicolon to delimit the macro invocation is the most efficient way to code the invocation for the SAS macro language compiler. However, omitting the semicolon results in satisfactory compilation, but it might run a little slower. Some exit points require that macros referenced within them do *not* use a delimiting semicolon.

IT Charge Management exit macros are invoked at different points in IT Resource Management. Some are between DATA or PROC steps. Some are within DATA or PROC steps. Some are within SAS statements. When the exit point exists within a SAS statement, a semicolon would end the statement prematurely. In such a situation, trailing semicolons must not be used.

For example, the PROC095 exit exists to add parameters inside a PROC SORT statement, immediately before the NODUP operand. The IT Charge Management PROC095 macro call (%ES_X095 without a semicolon) resolves to the following code:

```
; *
```

Inserting these characters in the PROC SORT statement results in

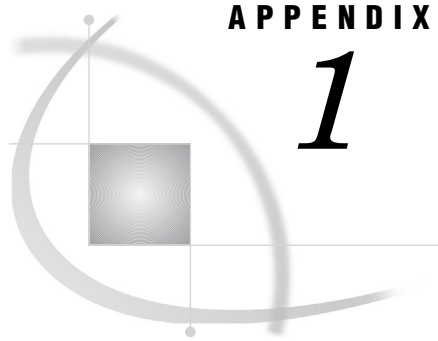
```
PROC SORT ... ; * NODUP;
```

which comments out the NODUP operand.

If, by accident, you added a semicolon to the contents of PROC095, inserting the characters shown above plus the accidental semicolon would result in

```
PROC SORT ... ; * ; NODUP;
```

which would result in an ERROR message (ERROR 180) and termination of the job.



File Structures

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File Structures: Overview

This appendix provides details on data files and source and parameter libraries used by SAS IT Charge Management. It includes information on

- “Site Common Libraries” on page 118
- “Variables in EC_SC (Debit and Credit File)” on page 119
- “Variables in the Consolidation Files” on page 120
- “Variables in the PDB "E" Tables Files” on page 120.

Site Common Libraries

This table lists the Site Common Libraries. Site Common Libraries are those related to a specific SAS IT Charge Management Site. These libraries contain modules and files common to all PDBs for one SAS IT Resource Management server installation used by SAS IT Charge Management.

Table A1.1 Table of Site Common Libraries

Libref/Fileref	Catalog or File Name	Description
SITELIB		- Modifiable SAS IT Resource Management modules - SAS IT Charge Management bootstrap source member
SASAUTOS		SAS IT Resource Management autocall library
ECSCNTL		JCL and jobstreams for site-specific jobs
ECLIB	ITCMGUI catalog	SAS IT Charge Management software that is not user modifiable
	ECUSER catalog	Site and PDB-related default specifications
	EC_CI data table	Default Charge Item Table
ECSITE	SAS IT Charge Management catalog (See Note 1)	SAS IT Charge Management software that is not user modifiable
	SAS IT Charge Management software that is not user modifiable (See Note 1)	- User-modifiable SAS IT Charge Management source - Generated SAS IT Charge Management source and formats
	EC_IN data table	Invoice data table
	EC_CA data table	Accounting Calendar table
	EC_CG data table	Charge Item Grouping table
	EC_RF data table	Report Format table
	EC_PR data table	Customer Profile table
	EC_SO data table (See Note 2)	Site Options of SAS IT Charge Management
	EC_PO data table (See Note 2)	PDB Options (PDB Table) for SAS IT Charge Management

Libref/Fileref	Catalog or File Name	Description
	EC_CI data table	User-modifiable Charge Item Table
ECAUTO		SAS IT Charge Management autocall library (SCP-sensitive format)
ECDATA		- SAS IT Charge Management Budget data - Non-PDB-specific data
	E_nnnnn data table (See Note 3)	Consolidation data for Invoice Period starting on day nnnnn
	E__COND data view (See Note 3)	View of all resident consolidation data
	E__CONP data view (See Note 3)	View of the most recent consolidation period
	EC__KEY data table (See Note 3)	Key Value file used by Key Fill in Debit/Credit and Profile edits
	EC_SC data table (See Note 3)	Supplemental Charges (Debits/Credits)
	ECXTRCT data table (See Note 3)	Extract data for AccountView from the last run of consolidation (only)

Note:

- 1 Populated during SAS IT Charge Management installation.
- 2 Populated during SAS IT Charge Management initialization or customization.
- 3 Populated during the first and subsequent Consolidation runs.

△

Variables in EC_SC (Debit and Credit File)

- “DATETIME” on page 125
- “DCDESC” on page 125
- “DCEDATE” on page 126
- “E0CCURR” on page 128
- “E0CHRG” on page 130
- “E0CITEM” on page 131
- “E0CQTY” on page 131
- “E0CRATE” on page 132
- “E0CTYPE” on page 133
- “E0CUST n (where $n=1$ to 9)” on page 133
- “E0INVSD” on page 135
- “E0MONTH” on page 135
- “E0RMDL” on page 136
- “E0YEAR” on page 137
- “MACHINE” on page 139

- “SHIFT” on page 140
- “SWIT” on page 140.

Variables in the Consolidation Files

- “DATETIME” on page 125
- “E0CCURR” on page 128
- “E0CHRG” on page 130
- “E0CITEM” on page 131
- “E0CQTY” on page 131
- “E0CRATE” on page 132
- “E0CTYPE” on page 133
- “E0CUST n (where $n=1$ to 9)” on page 133
- “E0DAY” on page 134
- “E0ENDTM” on page 134.
- “E0INVSD” on page 135
- “E0MONTH” on page 135
- “E0RMDL” on page 136
- “E0STRTM” on page 136
- “E0YEAR” on page 137
- “E1CHRG” on page 137
- “E1CRATE” on page 138
- “E2CHRG” on page 138
- “E2CRATE” on page 139
- “MACHINE” on page 139
- “SHIFT” on page 140

Variables in the PDB "E" Tables Files

- “DATETIME” on page 125
- “E0AUDID” on page 126 (detail only)
- “E0CCURR” on page 128
- “E0CHRG” on page 130
- “E0CITEM” on page 131
- “E0CQTY” on page 131
- “E0CQTY_S” on page 132 (in higher reduction levels only)
- “E0CRATE” on page 132
- “E0CTYPE” on page 133
- “E0CUST n (where $n=1$ to 9)” on page 133
- “E0DAY” on page 134
- “E0ENDTM” on page 134
- “E0MONTH” on page 135
- “E0RMDL” on page 136
- “E0STRTM” on page 136
- “E0YEAR” on page 137
- “MACHINE” on page 139
- “SHIFT” on page 140

CHGFMT

Table A1.2 CHGFMT

Attribute	Actual	Default
Name	CHGFMT	CHGFMT
Label	Charge Format	Charge Format
Length	8	8
Type	Character	Character
Format	\$8	\$8
By Variable	No	No

Description:

Charge Format contains the name of the display format for the Original Charges. The contents of this field are used by the SAS IT Charge Management Standard Invoice program to determine how to display the Original Charges. A similar field called CUSFMT stores the name of the display format for the Profile Charges. This variable exists on the extract file only.

Notes:

For information about using supplied formats in SAS IT Charge Management, see “SAS IT Charge Management Formats” on page 101. See also: Multi-currency Support in the Glossary.

CIDESC

Table A1.3 CIDESC

Attribute	Actual	Default
Name	CIDESC	CIDESC
Label	Charge Item Description	Charge Item Description
Length	32	32
Type	Character	Character
Format	None	None
By Variable	No	No

Description:

The CIDESC field is created by looking up the Charge Item Number against the \$CIDESC format. The format is created from the Description field of a Charge Item Definition. The description field is a place to describe the resource associated with the Charge Item Number. The Charge Item Description field is blank by default when you add a new charge item definition. It is populated by the user when a definition is added

or updated in the SAS IT Charge Management client interface. The field can contain up to 32 characters, numbers, blanks and national characters. It can not contain percent signs (%) or ampersands (&).

Notes:

See also: “Manage Charge Item Definitions” on page 33.

CUSFMT

Table A1.4 CUSFMT

Attribute	Actual	Default
Name	CUSFMT	CUSFMT
Label	Organization	Organization
Length	8	8
Type	Character	Character
Format	\$8	\$8
By Variable	No	No

Description:

Customer Format contains the name of the display format for the Profile Charges. The contents of this field are used by the SAS IT Charge Management Standard Invoice program to determine how to display the Profile Charges. A similar field called CHGFMT stores the name of the display format for the Original Charges. This variable exists on the extract file only.

For information about using supplied formats in SAS IT Charge Management, see “SAS IT Charge Management Formats” on page 101.

Notes:

See also: Multi-currency Support and Invoice Profile in the Glossary.

CUSTCURR

Table A1.5 CUSTCURR

Attribute	Actual	Default
Name	CUSTCURR	CUSTCURR
Label	Organization	Organization
Length	3	3
Type	Character	Character
Format	None	None
By Variable	Yes	Yes

Description:

CUSTCURR is the currency of preference as defined in the Invoice Profile. The value of currency depends on what was defined in the Currency action item and what was defined in the Invoice Profile for the customer. The currency value selected in the Currency action item is the default currency. The currency value selected in the Customer Profile overrides the default currency. This variable exists on the extract file only.

Notes:

For a list of acceptable values for CUSTCURR, refer to “E0CCURR” on page 128.

CUSTORG

Table A1.6 CUSTORG

Attribute	Actual	Default
Name	CUSTORG	CUSTORG
Label	Organization	Organization
Length	44	44
Type	Character	Character
Format	None	None
By Variable	Yes	Yes

Description:

CUSTORG is a variable that stores the name of the Invoice Profile associated with the Customer Name Key structure for the observation. This variable exists on the extract file only.

Notes:

See also: Invoice Profile in the Glossary.

CUSTOCHG

Table A1.7 CUSTOCHG

Attribute	Actual	Default
Name	CUSTOCHG	CUSTOCHG
Label	Customer Original Charge	Customer Original Charge
Length	8	8
Type	Numeric	Numeric

Attribute	Actual	Default
Format	None	None
By Variable	No	No

Description:

The Customer Original Charge contains the charge converted from the E0CHRG field to the currency specified in the Invoice Profile. This charge is available only on the extract file.

Notes:

See also: Multi-currency Support in the Glossary.

CUST1CHG

Table A1.8 CUST1CHG

Attribute	Actual	Default
Name	CUST1CHG	CUST1CHG
Label	Customer Modified Charge	Customer Modified Charge
Length	8	8
Type	Numeric	Numeric
Format	None	None
By Variable	No	No

Description:

The Customer Modified Charge contains the charge converted from the E1CHRG field to the currency specified in the Invoice Profile. This charge is available only on the extract file.

Notes:

See also: Multi-currency Support in the Glossary.

CUST2CHG

Table A1.9 CUST2CHG

Attribute	Actual	Default
Name	CUST2CHG	CUST2CHG
Label	Customer Apportioned Charge	Customer Apportioned Charge
Length	8	8
Type	Numeric	Numeric

Attribute	Actual	Default
Format	None	None
By Variable	No	No

Description:

The Customer Apportioned Charge contains the charge converted from the E2CHRG field to the currency specified in the Invoice Profile. This charge is available only on the extract file.

Notes:

See also: Multi-currency Support in the Glossary.

DATETIME

Table A1.10 DATETIME

Attribute	Actual	Default
Name	DATETIME	DATETIME
Label	Date and Time	Date and Time
Length	8	8
Type	numeric	numeric
Format	datetime19	datetime19
By Variable	no	no

Description:

The DATETIME variable contains the date and time the record was created. This variable is assigned directly from the record in the SAS IT Resource Management table being processed.

DCDESC

Table A1.11 DCDESC

Attribute	Actual	Default
Name	DCDESC	DCDESC
Label	Description of Entry	Description of Entry
Length	32	32
Type	Character	Character
Format	none	none
By Variable	No	No

Description:

The DCDESC field is a place to describe the reason for the debit or credit being entered. The Description of Entry field is blank by default. It is populated by the user when a Debit or Credit is entered in the SAS IT Charge Management client interface. It can also be populated in an Import Template. The field can contain up to 32 characters, numerics, blanks and national characters. It can not contain percent signs (%) or ampersands (&).

Notes:

See also Supplemental Charges (“Debits and Credits” on page 40) and Import Template in “Import/Export” on page 42.

DCEDATE

Table A1.12 DCEDATE

Attribute	Actual	Default
Name	DCEDATE	DCEDATE
Label	Effective Date	Effective Date
Length	8	8
Type	Numeric	Numeric
Format	date9	date9
By Variable	Yes	Yes

Description:

The DCEDATE variable contains the date the record should be used. This variable is created during import processing or in the Supplemental Charges window of the SAS IT Charge Management client. If you do not specify an effective date, the current system date is used.

Notes:

See also Supplemental Charges (“Debits and Credits” on page 40) and the Import Template in “Import/Export” on page 42.

E0AUDID

Table A1.13 E0AUDID

Attribute	Actual	Default
Name	E0AUDID	E0AUDID
Label	user-defined	Audit Id
Length	1-72, user-defined	1
Type	character	character

Attribute	Actual	Default
Format	user-defined	none
By Variable	yes	yes

Description:

The Audit Identifier is kept only at the DETAIL level of the SAS IT Charge Management PDB tables. The attributes for this variable are defined in the Customer Name Key Structure in the SAS IT Charge Management Client. You do not have to define or use the audit identifier field. If you choose not to use it, set the length to 1 and populate it with a single blank in the Customer Identification Routine. Otherwise, set the length and label in the Customer Name Key Structure. The value of this variable is populated in the customer identification routine. E0AUDID is used to audit the detail observations. During %CSPROCES, the Customer Identification Routine code is included in the processing. At that time all of the variables from the SAS IT Resource Management table are available for use to populate the Customer Name Keys and the Audit Identifier. Sometimes SAS IT Resource Management table variables might be used to conditionally populate keys, but these variables are not retained on the SAS IT Charge Management tables. For auditing purposes, it might be important to know the value of these variables.

You can customize the LENGTH and DESCRIPTION attributes of E0AUDID. The DESCRIPTION (label) of each field can have a length of 1 to 40. All descriptions are character strings. Leading and trailing blanks are removed. Embedded blanks are preserved. Some special characters are not enabled. These special characters are translated into different characters if you use them. A double quote (") is translated to a single quote ('). An ampersand (&) is translated to a plus sign (+). A percent sign (%) is translated to a forward slash (/). Any other special character is preserved.

Example:

You can have a variable on your SAS IT Resource Management table called "fieldA". In the Customer Identification Routine you can check fieldA's first two characters for particular values and can conditionally populate customer name key 1. Depending on the value found, a particular format is used with fieldA to derive the key value. In this situation you could place the original value of fieldA and the name of the format in the audit identifier field.

Note: Because key 1 contains the value returned from the format, the ability to find the contributing record from the SAS IT Resource Management table is lost. However, by using the audit id field to store the value of fieldA and the name of the format associated with fieldA, then you have an audit trail. \triangle

Notes:

See also "Customer Name Key Structures" on page 25 and "Customer Identification Routine" on page 26.

E0CCURR

Table A1.14 E0CCURR

Attribute	Actual	Default
Name	E0CCURR	E0CCURR
Label	Currency	Currency
Length	3	3
Type	character	character
Format	none	none
By Variable	yes	yes

Description:

E0CCURR is the currency of the incurred original charges. The value of currency depends on what was defined in the Currency action item and what was defined in the Customer Profile. The currency value selected in the Currency action item is the default currency. The currency value selected in the Customer Profile overrides the default currency.

E0CCURR can have the following values:

Table A1.15 Table of E0CCURR Values

Currency Symbol	Currency Description
ARP	Argentina, Peso
ATS	Austria, Schilling
AUD	Australia, Dollar
BBD	Barbados, Dollar
BEF	Belgium, Franc
BGL	Bulgaria, Lev
BMD	Bermuda, Dollar
BRR (BRL)	Brazil, Brazilian Real
BSD	Bahamas, Dollar
CAD	Canada, Dollar
CHF	Switzerland, Franc
CLP	Chile, Peso
CNY	China, Yuan Renminbi
CSK(CZK)	Czech Republic, Koruna
CYP	Cyprus, Pound
DEM	Germany, Deutsche Mark
DKK	Denmark, Krone
DZD	Algeria, Algerian Dinar

Currency Symbol	Currency Description
EGP	Egypt, Pound
ESP	Spain, Peseta
EUR	European Economic and Monetary Union (EMU), Euro
FIM	Finland, Markka
FJD	Fiji, Dollar
FRF	France, Franc
GBP	Great Britain, Pound Sterling
GRD	Greece, Drachma
HKD	Hong Kong, Dollar
HUF	Hungary, Forint
IDR	Indonesia, Rupiah
IEP	Ireland (Eire), Punt
ILS	Israel, Shekel
INR	India, Rupee
ISK	Iceland, Krona
ITL	Italy, Lira
JMD	Jamaica, Dollar
JOD	Jordan, Dinar
JPY	Japan, Yen
KRW	Korea (South), Won
LBP	Lebanon, Pound
LUF	Luxembourg, Franc
MXP	Mexico, Peso
MYR	Malaysia, Ringgit
NLG	Holland (The Netherlands), Guilder
NOK	Norway, Krone
NZD	New Zealand, Dollar
PHP	Philippines, Peso
PKR	Pakistan, Rupee
PLZ	Poland, Zloty
PTE	Portugal, Escudo
ROL	Romania, Leu
RUR	Russia, Ruble
SAR	Saudi Arabia, Riyal
SDD	Sudan, Dollar
SEK	Sweden, Krona
SGD	Singapore, Dollar

Currency Symbol	Currency Description
SKK	Slovakia, Koruna
THB	Thailand, Baht
TRL	Turkey, Lira
TTD	Trinidad and Tobago, Dollar
TWD	Taiwan, Dollar
USD	United States of America, US Dollar
VEB	Venezuela, Bolivar
XAG	Silver, Ounces
XAU	Gold, Ounces
XCD	East Caribbean Dollar
XDR	IMF Special Drawing Right
XPT	Platinum, Ounces
ZAR	South Africa, Rand
ZMK	Zambia, Kwacha

Notes:

See also “Customer Profile Information” on page 29 and Multi-currency Support in the Glossary.

E0CHRG

Table A1.16 E0CHRG

Attribute	Actual	Default
Name	E0CHRG	E0CHRG
Label	Original Charge	Original Charge
Length	8	8
Type	numeric	numeric
Format	none	none
By Variable	no	no

Description:

The Original Charge contains the charge (rate*quantity) specified in the Charge Item Edit table for this record’s rate model and charge item. This charge is calculated when the raw data is being processed (%CxPROCES) into SAS IT Resource Management and SAS IT Charge Management.

Notes:

See also “Manage Charge Item Definitions” on page 33 and Multi-currency Support in the Glossary.

E0CITEM

Table A1.17 E0CITEM

Attribute	Actual	Default
Name	E0CITEM	E0CITEM
Label	Charge Item	Charge Item
Length	6	6
Type	character	character
Format	\$CIDESC	\$CIDESC
By Variable	yes	yes

Description:

Charge Items define billable resources and services to SAS IT Charge Management. There are distributed Charge Items that are assigned 6-digit numbers for Charge Items. Additionally, you can define your own charge items in the Charge Item Properties of the SAS IT Charge Management Client. You can also associate the Charge Items with Charge Item Groups. These groups are used to summarize the data for reporting purposes only.

Notes:

See also “Charge Item Properties” on page 35 and the “SAS IT Charge Management Formats” on page 101.

E0CQTY

Table A1.18 E0CQTY

Attribute	Actual	Default
Name	E0CQTY	E0CQTY
Label	Charge Quantity	Charge Quantity
Length	8	8
Type	numeric	numeric
Format	none	none
By Variable	no	no

Description:

Charge Quantity is the amount of the resource units or service units consumed. At higher reduction levels, the summarization variable E0CQTY_S is available. Quantities can only be summarized when they represent the same resource or service and the same unit of measure.

Notes:

See also “Charge Item Properties” on page 35.

E0CQTY_S

Table A1.19 E0CQTY_S

Attribute	Actual	Default
Name	E0CQTY_S	E0CQTY_S
Label	Charge Quantity	Charge Quantity
Length	8	8
Type	numeric	numeric
Format	none	none
By Variable	no	no

Description:

Charge Quantity is the amount of the resource units or service units consumed. At higher reduction levels, the summarization variable E0CQTY_S is available. Quantities can only be summarized when they represent the same resource or service and the same unit of measure.

Notes:

(in higher reduction levels only)

See also “Charge Item Properties” on page 35.

E0CRATE

Table A1.20 E0CRATE

Attribute	Actual	Default
Name	E0CRATE	E0CRATE
Label	Original Rate	Original Rate
Length	8	8
Type	numeric	numeric
Format	none	none
By Variable	no	no

Description:

The Original Rate contains the rate specified in the Charge Item Edit table for this record’s rate model and charge item. This rate is used when the raw data is being processed (%CxPROCES) into SAS IT Resource Management and SAS IT Charge Management.

Notes:

See also “Manage Charge Item Definitions” on page 33 and Multi-currency Support in the Glossary.

E0CTYPE

Table A1.21 E0CTYPE

Attribute	Actual	Default
Name	E0CTYPE	E0CTYPE
Label	Charge Type	Charge Type
Length	4	4
Type	character	character
Format	\$ectype	\$ectype
By Variable	yes	yes

Description:

Charge Items define billable resources and services to SAS IT Charge Management. There are distributed Charge Items that are assigned 6-digit numbers for Charge Items. Additionally you can define your own charge items in the Charge Item Properties of the SAS IT Charge Management Client. You can also associate the Charge Items with Charge Item Groups. These groups are used to summarize the data for reporting purposes only.

Notes:

See also “Charge Item Properties” on page 35 and the “SAS IT Charge Management Formats” on page 101.

E0CUST n (where $n=1$ to 9)

Table A1.22 E0CUST n ($n=1$ to 9)

Attribute	Actual	Default
Name	E0CUST n ($n=1$ - 9)	E0CUST n ($n=1$ - 9)
Label	user-defined	unknown
Length	1-70, user-defined	1
Type	character	character
Format	user-defined	none
By Variable	yes	yes

Description:

The Customer Name Key variables (referred to as "keys") are parts of the summarization structure of SAS IT Charge Management PDB and Consolidated tables. The attributes are defined in the Customer Name Key Structure in the SAS IT Charge Management Client. You must define at least 1 key. The values of these variables are populated in the customer identification routine. These keys are used to assign

resources or services consumed to the consumer. The consumers are then mapped to a billable entity using Customer Profiles.

The nine variables are used collectively as the primary component of the variable list on the CLASS statement during table summarization. Each of these customer keys is a separate and distinct variable in the table summarization key and helps to identify the customer. You can customize the LENGTH and DESCRIPTION attributes of the customer keys.

The DESCRIPTION (label) of each field can have a length of 1 to 40. All descriptions are character strings. Leading and trailing blanks are removed. Embedded blanks are preserved. Some special characters are not enabled. These special characters are translated into different characters if you use them. A double quote (") is translated to a single quote ('). An ampersand (&) is translated to a plus sign (+). A percent sign (%) is translated to a forward slash (/). Any other special character is preserved.

Notes:

See also “Customer Name Key Structures” on page 25, “Customer Identification Routine” on page 26, and “Customer Profile Information” on page 29.

E0DAY

Table A1.23 E0DAY

Attribute	Actual	Default
Name	E0DAY	E0DAY
Label	Fiscal Day	Fiscal Day
Length	8	8
Type	numeric	numeric
Format	none	none
By Variable	yes	yes

Description:

The Fiscal Day contains the day of the fiscal period. Based on the Accounting Calendar and Invoice Schedule, the fiscal day is derived from DATETIME.

Notes:

See also “Accounting Calendar” on page 21, “Invoice Schedule” on page 22, and “DATETIME” on page 125.

E0ENDTM

Table A1.24 E0ENDTM

Attribute	Actual	Default
Name	E0ENDTM	E0ENDTM
Label	End Date and Time	End Date and Time

Attribute	Actual	Default
Length	8	8
Type	numeric	numeric
Format	datetime19	datetime19
By Variable	No	No

Description:

The E0ENDTM variable contains the end date and time for the activity on the data record. This variable is assigned directly from the record in the SAS IT Resource Management table being processed.

E0INVSD

Table A1.25 E0INVSD

Attribute	Actual	Default
Name	E0INVSD	E0INVSD
Label	Start Date of Invoice Period	Start Date of Invoice Period
Length	8	8
Type	numeric	numeric
Format	date9	date9
By Variable	yes	yes

Description:

The E0INVSD variable contains the date and time the record was created. This variable is created during processing of the SAS IT Resource Management table. It is determined by the value of DATETIME, the DATECHK parameter and the Invoice Schedule.

Notes:

See also “Invoice Schedule” on page 22, “Accounting Calendar” on page 21, the “DATECHK Global Macro Variable” on page 68, and “DATETIME” on page 125.

E0MONTH

Table A1.26 E0MONTH

Attribute	Actual	Default
Name	E0MONTH	E0MONTH
Label	Fiscal Month	Fiscal Month
Length	8	8
Type	numeric	numeric

Attribute	Actual	Default
Format	none	none
By Variable	yes	yes

Description:

The Fiscal Month contains the month of the fiscal period. Based on the Accounting Calendar and Invoice Schedule, the fiscal month is derived from DATETIME.

Notes:

See also “Invoice Schedule” on page 22, “Accounting Calendar” on page 21, and “DATETIME” on page 125.

E0RMDL

Table A1.27 E0RMDL

Attribute	Actual	Default
Name	E0RMDL	E0RMDL
Label	Rate model	Rate Model
Length	16	16
Type	character	character
Format	\$16	\$16
By Variable	yes	yes

Description:

The Rate Model variable contains the rate model name (up to 8 characters) concatenated with the effective date (8 characters) of the rate model. The name and effective dates are specified in the Charge Item Edit window of the SAS IT Charge Management Client. E0RMDL indicates which rate structure was used to derive the charges for the observation.

Notes:

See also “Manage Charge Item Definitions” on page 33 and “Define Rate Models, Charges, and Assignments” on page 57.

E0STRTM

Table A1.28 E0STRTM

Attribute	Actual	Default
Name	E0STRTM	E0STRTM
Label	Start Date and Time	Start Date and Time
Length	8	8

Attribute	Actual	Default
Type	numeric	numeric
Format	datetime19	datetime19
By Variable	No	No

Description:

The E0STRTM variable contains the start date and time for the activity on the data record. This variable is assigned directly from the record in the SAS IT Resource Management table being processed.

E0YEAR

Table A1.29 E0YEAR

Attribute	Actual	Default
Name	E0YEAR	E0YEAR
Label	Fiscal Year	Fiscal Year
Length	8	8
Type	numeric	numeric
Format	none	none
By Variable	yes	yes

Description:

The Fiscal Year contains the year of the fiscal period. Based on the Accounting Calendar and Invoice Schedule, the fiscal year is derived from DATETIME.

Notes:

See also “Accounting Calendar” on page 21, “Invoice Schedule” on page 22, and “DATETIME” on page 125.

E1CHRG

Table A1.30 E1CHRG

Attribute	Actual	Default
Name	E1CHRG	E1CHRG
Label	Modified Charge	Modified Charge
Length	8	8
Type	numeric	numeric

Attribute	Actual	Default
Format	none	none
By Variable	no	no

Description:

The Modified Charge contains the charge specified or calculated in the Edit/Apportion Charges action item for this record's charge item. This charge is available only on the consolidation files.

Notes:

See also "Edit Charges" on page 84 and Multi-currency Support in the Glossary.

E1CRATE

Table A1.31 E1CRATE

Attribute	Actual	Default
Name	E1CRATE	E1CRATE
Label	Modified Rate	Modified Rate
Length	8	8
Type	numeric	numeric
Format	none	none
By Variable	yes	yes

Description:

The Modified Rate contains the rate specified in the Edit/Apportion Charges action item for this record's charge item. This rate is available only on the consolidation files.

Notes:

See also "Edit Charges" on page 84 and Multi-currency Support in the Glossary.

E2CHRG

Table A1.32 E2CHRG

Attribute	Actual	Default
Name	E2CHRG	E2CHRG
Label	Apportioned Charge	Apportioned Charge
Length	8	8
Type	numeric	numeric

Attribute	Actual	Default
Format	none	none
By Variable	no	no

Description:

The Apportioned Charge contains the charge specified or calculated in the Edit/ Apportion Charges action item for this record's charge item. This charge is available only on the consolidation files.

Notes:

See also "Edit Charges" on page 84 and Multi-currency Support in the Glossary.

E2CRATE

Table A1.33 E2CRATE

Attribute	Actual	Default
Name	E2CRATE	E2CRATE
Label	Apportioned Rate	Apportioned Rate
Length	8	8
Type	numeric	numeric
Format	none	none
By Variable	yes	yes

Description:

The Apportioned Rate contains the rate specified in the Edit/Apportion Charges action item for this record's charge item. This rate is available only on the consolidation files.

Notes:

See also "Edit Charges" on page 84 and Multi-currency Support in the Glossary.

MACHINE

Table A1.34 MACHINE

Attribute	Actual	Default
Name	MACHINE	MACHINE
Label	Machine	Machine
Length	8	8
Type	character	character

Attribute	Actual	Default
Format	none	none
By Variable	yes	yes

Description:

The MACHINE variable contains the value of the machine or system identifier that created the data record processed. When z/OS is the platform generating the data, the MACHINE variable usually contains the SMFID or system id.

SHIFT

Table A1.35 SHIFT

Attribute	Actual	Default
Name	SHIFT	SHIFT
Label	Operations Shift	Operations Shift
Length	1	1
Type	character	character
Format	\$SHIFT	\$SHIFT
By Variable	yes	yes

Description:

The SHIFT variable contains the value of the SHIFT or zone from the SAS IT Resource Management data record processed. When z/OS is the platform generating the data and MXG is being used, the shift definitions for populating the variable might be in MXG.

SWIT

Table A1.36 SWIT

Attribute	Actual	Default
Name	SWIT	SWIT
Label	Switch	Switch
Length	1	1
Type	Character	Character
Format	none	none
By Variable	No	No

Description:

The SWIT variable is initialized to a single blank. It is an internal switch for SAS IT Charge Management. This variable is only on the EC_SC (debit and credit) file. Only supplemental charges and imported charges are in this file.

Notes:

See also the topic on the Import Template in the section called “Import/Export” on page 42.

PDB-unique Libraries

This table lists the PDB-unique Libraries. There is one set of these libraries for each PDB in the SAS IT Charge Management Site.

Table A1.37 Table of PDB-unique Libraries

Libref/Fileref	Catalog or File Name	Library Content
DETAIL (See Note 2)	Exxxxxx	SAS IT Resource Management DETAIL reduction-level PDB tables for SAS IT Charge Management
MONTH (See Note 2)	Exxxxxx	SAS IT Resource Management MONTH reduction-level PDB tables for SAS IT Charge Management
ECWORK (See Note 2)		SAS IT Charge Management detail data generated during %CxPROCES to be used as staged data for the second %CxPROCES in the process and reduce task for SAS IT Resource Management and SAS IT Charge Management.
ECCNTL		JCL and Jobstreams for PDB-unique jobs
ECPDB	ECUSER catalog (See Note 1)	- User-modifiable SAS IT Charge Management parameters - Generated SAS IT Charge Management source and formats
	EC_C1 data table (See Note 1)	Table of user-selected Charge Items in this PDB

Notes:

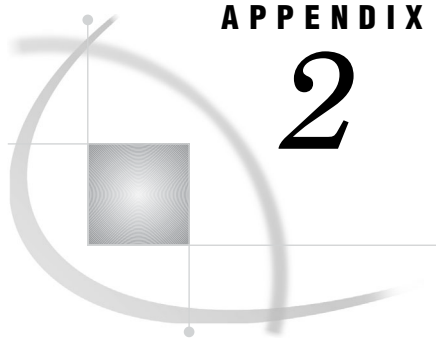
- 1 Populated during first definition of the PDB under SAS IT Charge Management.
- 2 Populated during the first and subsequent Collect runs (process and reduce tasks).

User-unique Libraries

This table lists the User-unique Level Libraries. There is one set of these libraries for each user of SAS IT Charge Management.

Table A1.38 Table of User-unique Level Libraries

Libref/Fileref	Catalog or File Name	Library Content
SASUSER	CPUSROPT data table	List of known PDBs (one observation per PDB). Updated by SAS IT Resource Management. SAS IT Charge Management only reads this file.



APPENDIX

2

Interface to CA-MICS

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Interface to CA-MICS: Overview

This section describes how to use process exits in creating SAS IT Resource Management derived variables to emulate CA-MICS account codes.

SAS IT Resource Management provides the capability of deriving data element values from other elements of raw input data and storing those derived elements in stored data. This is particularly necessary for duplicating the structure of certain CA-MICS database files with equivalent SAS IT Resource Management tables.

This appendix demonstrates the methodology for adding derived variables to SAS IT Resource Management (formerly, IT Service Vision 2.1 and later), specifically applied to defining CA-MICS-like "account code" class variables.

The three basic steps involved in creating derived variables are:

- 1 "Define the Variable(s) to the Data Dictionary" on page 143
- 2 "Convert Your CA-MICS" on page 145
- 3 "Run the %CPDDUTL Task" on page 146.

In the following example, we will add derived variables called ACCTNO1 and ACCTNO2 to tables XJOBS and XSMFINT. These variables take the place of the CA-MICS SMF account code data elements called ACCTNO1 and ACCTNO2.

- Because CA-MICS can have up to nine account codes per cost center structure on any CA-MICS component, you can define up to nine (any number, really) such fields. Therefore, to mimic CA-MICS ACCTNO1-9, you can define ACCTNO1-9 to SAS IT Resource Management.
- Most CA-MICS Data Integration components have account code structures. These CA-MICS components include TSO, CICS, IMS, IDMS, SNT, VMS, VMC, and so on. It would be convenient to pick similarly structured names for the account code data elements on the equivalent SAS IT Resource Management tables. Thus, the CA-MICS data elements TSOACT1-9 would suggest adding variables TSOACT1-9 to the SAS IT Resource Management tables for user activity under CA-TSO/MON.

Define the Variable(s) to the Data Dictionary

The value for a derived variable is stored in the PDB just like the data for any other (non-formula) variable. When you define a derived variable, you will need to follow the

SAS IT Resource Management conventions for specifying variables. Like all other variables, the derived variables need to be defined to the PDB once per table.

The following is an example of the %CPDDUTL control statements to define ACCTNO1 and ACCTNO2 to the XJOBS and XSMFINT tables:

```

set table name=XJOBS ;
  delete variable name=ACCTNO1 noerror ; /* delete if exists */
  delete variable name=ACCTNO2 noerror ; /* delete if exists */
  CREATE DERIVED NAME= ACCTNO1 LENGTH=36
    LABEL ='Department' DESCRIPTION='Department'
    KEPT  =YES INTERPRET=STRING TYPE=CHARACTER
    SOURCE={ %ACCTSMF; /* ONLY ONE MACRO CALL IS NEEDED */
  }
;
  CREATE DERIVED NAME= ACCTNO2 LENGTH=24
    LABEL ='Division' DESCRIPTION='Division'
    KEPT  =YES INTERPRET=STRING TYPE=CHARACTER
    SOURCE={ /* MACRO CALLED ONLY ON FIRST ACCOUNT CODE VARIABLE */
  }
;
  UPDATE TABLE NAME= XJOBS
    DETAIL=(BYVARS= ' MACHINE ACCTNO1 ACCTNO2 TYETASK RAFUSER DATETIME SHIFT' )
    DAY    =(CLASSVARS= ' MACHINE ACCTNO1 ACCTNO2 TYETASK RAFUSER DATETIME SHIFT' )
    WEEK   =(CLASSVARS= ' MACHINE ACCTNO1 ACCTNO2 TYETASK RAFUSER DATETIME SHIFT' )
    MONTH  =(CLASSVARS= ' MACHINE ACCTNO1 ACCTNO2 TYETASK RAFUSER DATETIME SHIFT' )
    YEAR   =(CLASSVARS= ' MACHINE ACCTNO1 ACCTNO2 TYETASK RAFUSER DATETIME SHIFT' )
;

set table name=XSMFINT ;
  delete variable name=ACCTNO1 noerror ; /* delete if exists */
  delete variable name=ACCTNO2 noerror ; /* delete if exists */
  CREATE DERIVED NAME= ACCTNO1 LENGTH=36
    LABEL ='Department' DESCRIPTION='Department'
    KEPT  =YES INTERPRET=STRING TYPE=CHARACTER
    SOURCE={ %ACCTSMF; /* ONLY ON FIRST ACCOUNT CODE VARIABLE */
  }
;
  CREATE DERIVED NAME= ACCTNO2 LENGTH=24
    LABEL ='Division' DESCRIPTION='Division'
    KEPT  =YES INTERPRET=STRING TYPE=CHARACTER
    SOURCE={ /* MACRO CALLED ONLY ON FIRST ACCOUNT CODE VARIABLE */
  }
;
  UPDATE TABLE NAME= XSMFINT
    DETAIL=(BYVARS= ' MACHINE ACCTNO1 ACCTNO2 TYETASK RAFUSER DATETIME SHIFT' )
    DAY    =(CLASSVARS= ' MACHINE ACCTNO1 ACCTNO2 TYETASK RAFUSER DATETIME SHIFT' )
    WEEK   =(CLASSVARS= ' MACHINE ACCTNO1 ACCTNO2 TYETASK RAFUSER DATETIME SHIFT' )
    MONTH  =(CLASSVARS= ' MACHINE ACCTNO1 ACCTNO2 TYETASK RAFUSER DATETIME SHIFT' )
    YEAR   =(CLASSVARS= ' MACHINE ACCTNO1 ACCTNO2 TYETASK RAFUSER DATETIME SHIFT' )
;

```

In the above example, the macro %ACCTSMF is called only once. This macro will be created in Step 2. The %ACCTSMF macro populates all the account code data elements as does its CA-MICS counterpart.

After the variable has been defined to the data dictionary, you are ready to create and use your exit.

Convert Your CA-MICS

This step shows how to convert your CA-MICS account code determination exit to a macro suitable for calling by SAS IT Resource Management. When you create your exit, use the original CA-MICS routine that assigns values to the CA-MICS account code data elements as a starting point. An example with two variables, ACCN01 and ACCTN02, is shown in Step 1 and throughout this appendix. Store a copy of this logic in the SAS IT Resource Management autocall macros library, MACROS, in a member whose name is the same as the name of the macro that is referenced in the CREATE DERIVED... > SOURCE={>...} parameter.

When you use this macro to populate account code elements that are processed with one or more other tables, bracket the logic with a macro conditional that resolves the logic only for those tables into which the account code variables are to be put. Also, change the code to populate the account code variables from SAS IT Resource Management variables rather than CA-MICS data elements. This involves changing the names of some data elements and changing the expected values of others.

For our example, let us assume that variables ACCTNO1 and ACCTNO2 were populated as follows in CA-MICS:

```
IF PGMTYPE EQ 1 THEN DO; /* BATCH JOB DATA */
    ACCTNO1=SUBSTR(JOB,1,3); /* FIRST 3 CHARS OF JOB NAME */
    ACCTNO2=SUBSTR(JOBPRGM,1,5);
END;
ELSE IF PGMTYPE EQ 2 THEN DO; /* TSO SESSION */
    ACCTNO1=SUBSTR(RACFUSID,1,3);
    ACCTNO2=SUBSTR(RACFUSID,4,2);
END;
ELSE IF PGMTYPE EQ 3 THEN DO; /* STARTED TASK */
    IF PROGRAM EQ: 'DFH' THEN ACCTNO1='ONL';
    ELSE ACCTNO1='OHD';
    ACCTNO2=' ';
END;
```

To install the same logic in SAS IT Resource Management, put the code in a macro named ACCTSMF, change the CA-MICS data element names to SAS IT Resource Management equivalent variable names, and adjust the program logic to use the different values for decision variables. The converted exit might resemble this code:

Example Code A2.1 Contents of macro ACCTSMF:

```
%macro ACCTSMF;
    %if &CPTABLE=%upcase(XJOBS) or
        &CPTABLE=%upcase(XSMFINT) %then %do;
        IF TYETASK EQ 'JOB' THEN DO; /* BATCH JOB DATA */
            ACCTNO1=SUBSTR(JOB,1,3); /* FIRST 3 CHARS OF JOB NAME */
            ACCTNO2=SUBSTR(PGRNAME,1,5);
        END;
        ELSE IF TYETASK EQ 'TSU' THEN DO; /* TSO SESSION */
            ACCTNO1=SUBSTR(RAFUSER,1,3);
            ACCTNO2=SUBSTR(RAFUSER,4,2);
        END;
        ELSE IF TYETASK EQ 'STC' THEN DO; /* STARTED TASK */
            IF PROGRAM EQ: 'DFH' THEN ACCTNO1='ONL';
            ELSE ACCTNO1='OHD';
```

```

        ACCTNO2=' ' ;
    END;
%end;
%mend ACCTSMF;

```

An alternative exists to aid the conversion of the routine to SAS IT Resource Management variable names. If there is no overlap of variable names, it is possible to create a set of temporary variables in the exit that mimic the CA-MICS working data element names. If such temporary variables are assigned, it can be possible to include the original CA-MICS derivation logic. Consider this example:

Example Code A2.2 Contents of macro ACCTSMF:

```

%macro ACCTSMF;
    %if &CPTABLE=%upcase(XJOBS) or
        &CPTABLE=%upcase(XSMFINT) %then %do;
        JOBPRGNM=PGRNAME;
        RACFUSID=RAFUSER;
        SELECT TYETASK;
            WHEN ( 'JOB' ) PGMTYPE=1;
            WHEN ( 'TSU' ) PGMTYPE=2;
            WHEN ( 'STC' ) PGMTYPE=3;
            OTHERWISE PGMTYPE=.;
        END;
        IF PGMTYPE EQ 1 THEN DO; /* BATCH JOB DATA */
            ACCTNO1=SUBSTR(JOB,1,3); /* FIRST 3 CHARS OF JOB NAME */
            ACCTNO2=SUBSTR(JOBPRGNM,1,5);
        END;
        ELSE IF PGMTYPE EQ 2 THEN DO; /* TSO SESSION */
            ACCTNO1=SUBSTR(RACFUSID,1,3);
            ACCTNO2=SUBSTR(RACFUSID,4,2);
        END;
        ELSE IF PGMTYPE EQ 3 THEN DO; /* STARTED TASK */
            IF PROGRAM EQ: 'DFH' THEN ACCTNO1='ONL';
            ELSE ACCTNO1='OHD';
            ACCTNO2=' ' ;
        END;
    %end;
%mend ACCTSMF;

```

Run the %CPDDUTL Task

Submit the job created in Step 1. Check the output for errors and warning messages. Investigate any anomalies.

Note: These notes should be used as part of a complete conversion plan. Be sure to test thoroughly as many logic paths as possible during the parallel test period. \triangle

Glossary

accounting

the act or process of quantifying and measuring the usage of IT resources.

accounting calendar

a feature that defines a fiscal calendar to SAS IT Charge Management.

AccountView

an enterprise information system (EIS) application that is used for reporting on SAS IT Charge Management data. After downloading the performance data from the SAS IT Charge Management server, you can use AccountView to view or print the data.

apportioning

the act or process of distributing fixed costs or credits to several customers in order to perform zero balancing. See also zero balancing.

billing hierarchy

the structure of an organization as it has been defined for the purpose of charging organizational entities for the IT resources that they use. For example, a billing hierarchy typically includes divisions, departments, and individual users.

charge consolidation

the process of merging all summarized charge data in a PDB with all supplemental charges in order to produce a single consolidated file.

charge currency

the currency that has been specified for a particular rate model. In SAS IT Charge Management files, the E0CCURR variable contains the charge currency.

charge data

data that is added to the SAS IT Resource Management tables by SAS IT Charge Management software and which consists of measurements, charges, and customer keys. Charge data is stored in the PDB reduction levels DETAIL, DAY, WEEK, MONTH and YEAR. (SAS IT Charge Management creates a copy of all SAS IT Resource Management tables that are used for charging. These copies have names that begin with 'EC'.)

charge item

any IT resource whose costs can be charged to users of the resource. In SAS IT Charge Management, each charge item is represented by a six-digit numeric code and is mapped either to a SAS IT Resource Management variable or to a calculation

that is based on one or more SAS IT Resource Management variables. In SAS IT Charge Management files, the E0CITEM variable contains the charge item.

charge type

a two-byte field that signifies the SAS IT Charge Management record type of each particular observation. Record types include debits, credits, shift charges, and budget data. In SAS IT Charge Management files, the E0CTYPE variable contains the charge type.

chargeback

the process of recovering IT costs by charging departments or other organizational entities for the IT resources that they use.

chargeback data model

a visual representation of a company's accounting goals and chargeback goals.

collector

software that produces logs of performance data. Collectors track information such as system utilization, network utilization, resource utilization, and the utilization of services such as phones, fax machines, and Web servers.

collector support

a set of software components that provide a variety of functions that enable SAS IT Resource Management to work with data from a particular collector. Each collector-support component is identified by both a collector name and a tool name.

collector support

a set of software components that provide a variety of functions that enable SAS IT Resource Management to work with data from a particular collector. Each collector-support component is identified by both a collector name and a tool name.

consolidation

See charge consolidation.

CPU normalization

the act or process of taking CPU usage values that have been collected on CPUs that operate at different speeds and multiplying those values by normalization factors so that the charges assessed for CPU usage are equitable no matter what type of CPU is used. The normalization factors are based on comparisons to one particular type of CPU that has been specified as the standard for a particular site. CPU normalization is sometimes referred to as processor normalization.

CPUSROPT table

a table in the SASUSER library that contains the name and location of all PDBs at a particular site that have been accessed by SAS IT Resource Management. The SASUSER library is shared by the remote SAS session, SAS IT Resource Management, and SAS IT Charge Management.

credit

a charge that does not originate from regular PDB process steps and reduce steps and which enables you to change a processed charge (for example, to add a one-time discount). A credit is a type of manual adjustment that is deducted from the total amount due on an account.

customer identification routine

a customized, site-specific routine that populates the customer name key variables (E0CUST1-E0CUST9) with the customer name keys.

customer name keys

values that associate resources with the consumers of those resources. SAS IT Charge Management provides a maximum of nine customer name keys, which are stored in the E0CUST1-E0CUST9 variables in the table summarization key.

customer profile

See invoice profile.

data collector

software that collects logged data that is related to IT services. The data collector could be a facility of the operating system, a product that is provided by a third-party vendor, or software that is written by consultants or by SAS IT Resource Management customers.

data dictionary

See master data dictionary, PDB's data dictionary.

data model

See chargeback data model.

debit

a charge that does not originate from regular PDB process steps and reduce steps and which enables you to change a processed charge (for example, to add a one-time surcharge). A debit is sometimes called a supplemental charge.

default currency

the currency that is used in the initial displays of the SAS IT Charge Management client windows. You use the Manage Site Defaults function in SAS IT Charge Management to specify the default currency.

discount

a reduction that is applied to a charge during period-end processing. The reduction is based on some predetermined condition.

fiscal calendar

an annual period of time for which an organization plans the use of its funds. The fiscal calendar does not necessarily match the Gregorian calendar.

Gregorian calendar

the 12-month, 365-day (except in leap years) calendar that was introduced by Pope Gregory XIII in 1582 as a revision of the Julian calendar. Today the Gregorian calendar is used in most countries.

identification routine

See customer identification routine.

invoice profile

a set of attributes (such as mailing information, contact name, and billing status) that define an organizational unit to which an invoice is sent.

invoice schedule

a schedule that specifies how often and on which dates SAS IT Charge Management invoices are generated.

manual adjustments

debits and credits that are entered by the user from the Operations tab of the SAS IT Charge Management system.

master data dictionary

the master definitions of tables and their associated variables, as well as override control statements, if any. Master copies of user-written definitions can be installed in the data dictionary, too.

minimum charge

a charge for a resource that overrides any smaller charge that is calculated by the system. You can use the Charge Item Properties feature of SAS IT Charge Management to specify a minimum charge.

month end

the end of the month, at which time charges are manipulated and consolidated, reports and invoices are generated and distributed, and all applicable external files and inputs to the general ledger are generated.

multi-currency support

a feature that enables multiple currencies to be used when charges are applied to resources and for reporting. Each rate model definition can have a different currency. Each customer profile also has a currency associated with it.

PDB

See performance data warehouse.

PDB's data dictionary

in a performance data warehouse (PDB), a SAS library whose name and libref are DICTLIB. The library contains metadata such as definitions of tables and variables and status information for the data that the tables contain.

performance data warehouse (PDB)

logically, a data warehouse that contains detailed and summarized performance data, as well as information (metadata) that is needed for managing the data. Physically, each PDB consists of a coordinated set of nine SAS libraries that contain performance data plus other information that is related to one or more IT services.

period end

the end of an accounting period, at which time charges for the period are manipulated and consolidated, reports and invoices are generated and distributed, and all applicable external files and inputs to the general ledger are generated.

profile

See invoice profile.

profile currency

the currency whose exchange rates are to be used for the charges that are associated with it. The profile currency is specified in the SAS IT Charge Management customer profile.

proration

the act or process of distributing charges proportionally. Charges that cannot be directly assigned to a particular customer are typically prorated among all customers.

rate model

a structure that identifies individual customers (or a group of customers) and which associates the customer(s) with a specific set of billing rates.

shift charges

charges for IT resources that are specific to a particular work shift. Shift charges can be used to encourage or discourage the consumption of IT resources. For example, shift charges can be increased in order to discourage the use of IT resources during time periods when these resources are typically in high demand.

site

a single-server installation of SAS IT Resource Management, whose data is used by SAS IT Charge Management as input for charging fees for the use of IT services.

supplemental charges

See debit, credit.

surcharge

an additional charge (or penalty) that is based on some predetermined condition. In SAS IT Charge Management, surcharges are issued during processing that occurs at the end of a period (for example, at month end).

unassigned charge

a charge that has not yet been assigned to a particular customer.

user

a person who works with SAS IT Charge Management software or with SAS IT Charge Management AccountView software. Users might include SAS IT Charge Management administrators, SAS IT Resource Management administrators, and managers or financial analysts who use AccountView.

zero balancing

a chargeback methodology that distributes a predetermined IT expense on the basis of actual resource consumption, ensuring that neither a profit nor a loss is achieved. Zero balancing is typically used in an organization in which the IT division is not a profit-making business unit. One way to zero balance is to apportion the costs. See also apportioning.

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