Installation Instructions and System Administrator’s Guide for Release 8.2 (TS2M0) of the SAS® System under UNIX® Environments

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29 August 2003
Chapter 1, Before You Install the SAS® System

This document provides instructions for installing and configuring the SAS System for UNIX environments. The following systems are supported in this release. We recommend that you refer to the accompanying System Requirements for specific operating system and hardware requirements.

- ABI+ for Intel® Architecture, supported on the following systems:
  - NCR MP-RAS
  - SCO UnixWare
  - Sequent DYNIX/ptx
  - Sun Solaris
- AIX (32 & 64 bit enabled)
- Compaq Tru64 UNIX
- HP-UX (32 & 64 bit enabled)
- IRIX
- Linux
- Solaris (32 & 64 bit enabled)

Audience

This document is intended for persons responsible for installing and maintaining UNIX software at your site.

Using This Book

This document conforms to the following conventions:

- A Computer icon indicates that system-specific information appears to the right of the graphic.
- Monospace type indicates commands, directory paths, filenames, etc.
- Italic type indicates documentation references or key notes.
- Uppercase type indicates variable and option settings.
- Indicates a UNIX environment variable.
- Indicates an internal SAS environment variable. Note that when a variable can be either a SAS or UNIX environment variable, the SAS convention is used.
Terminology

The following are brief descriptions of some of the SAS System-specific terms used throughout this document:

- **National Language Support (NLS)**
  localization components of the SAS System for various languages, included in your package on International Pack media when appropriate.

- **Post-Processing**
  After installation, some SAS software components require special processing. SAS Setup will perform most of the required post-processing; however, certain post-processing steps must be completed manually. Please see Chapter 3, “Post-Installation Instructions” on page 17 for details.

- **SAS Setup**
  the program that performs the installation and maintenance of the SAS System. When you perform an install, SAS Setup is stored in `!SASROOT/sassetup`.

- **SASROOT**
  the root directory of the SAS System where all SAS files and subdirectories are loaded.

  **Note:** Throughout this document, `!SASROOT` is used in directory paths referring to files in your SAS root directory. This is a logical concept. You should substitute the actual path of your SAS root directory wherever you see `!SASROOT`.

- **SETINIT**
  information used to authorize the SAS System at your site. The Contracts Division at SAS supplies SETINIT information. When you contract to renew the SAS System or add additional products to your current license, you must apply new SETINIT information. For more information, refer to “Applying SETINIT to Authorize the SAS System” on page 22 in Chapter 3 of this document.

- **Software Updates**
  replacement files containing fixes and enhancements to the SAS System. Software updates are included in your packages when appropriate.

- **TS-level**
  a specific value assigned to a release of the SAS System. For example, the TS-level for Release 8.2 of the SAS System is TS2M0. You can find this value at the top of the SAS log.
Using Netscape Communicator

You must have Netscape Communicator installed on your system because some SAS System product features will not function without it. If you have Netscape installed on your system, make sure the directory containing the browser is included in your $PATH before invoking the SAS System. Please refer to the System Requirements document to find out where to obtain the appropriate release of Netscape Communicator for your system.

Recovering From Errors

Errors can occur during the installation process. If they occur during the prompting phase of the install, you will be notified of the nature of the error and given suggestions on how to correct it. If errors occur during the loading or post-processing phases of the install, they are written to the install logs, and an error status is returned from the installation. You should always check the install logs for errors after the installation is complete. All installation logs are stored in !SASROOT/.install/, in the logs, logs_sh, and sas subdirectories. If errors occur, SAS Setup points you to the appropriate log file where you can determine the cause.

If you need assistance with correcting an error, contact SAS Technical Support as described in “Contacting SAS Technical Support” on page 4.

Service and Support

Online Documentation

A SAS OnlineDoc CD is included in your package containing a complete library of SAS software documentation. The SAS OnlineDoc CD can be mounted or installed on any system and requires Netscape Navigator. Please refer to the System Requirements accompanying the CD for specific version requirements.

The directory !SASROOT/doc contains versions of Alert Notes, System Requirements, and the Installation Instructions in several formats. See the README file, also found in !SASROOT/doc, for information on how to browse and print these files. Copies of these enclosures can also be found in the doc directory on the installation media. The latest versions of these enclosures can be downloaded from the SAS Technical Support Web page:

http://www.sas.com/ts

You may also visit the following Web page for access to the most up-to-date Alert Notes, System Requirements, new feature documentation, etc.:

http://www.sas.com/newversion

If you are unable to access this URL, you can request a CD-ROM with documentation in PDF format about SAS software changes and enhancements. Contact the SAS Distribution Center at (919) 531-7851. Changes and enhancements documentation for most Release 8.2 SAS products can be found in SAS System Help.
It is essential that one or more representatives at your site subscribe to TSNEWS-L in order to receive valuable problem notifications concerning your software. To subscribe, send e-mail to LISTSERV@VM.SAS.COM. The body of the e-mail should read SUBSCRIBE TSNEWS-L. In the past, problem notifications were sent hardcopy to customers; however, now, they will only be available via TSNEWS-L.

Additional Publications

SAS provides many publications about SAS System products and how to use them on specific hosts. For a complete list of SAS System publications, refer to the current Publications Catalog. The catalog is produced twice a year. You can view a current on-line copy of the Publications Catalog on your SAS OnlineDoc CD or on the Internet at

http://www.sas.com/pubs/

You can also order a free copy of the catalog by writing to the following address:

SAS
Book Sales Department
SAS Campus Dr.
Cary, NC 27513-2414

Contacting SAS Technical Support

If you encounter errors or have questions regarding the installation, SAS provides technical support via the Internet, telephone, mail, dial-up computer access, or electronic mail. For technical support via the Internet, use the following URL:

http://www.sas.com/ts/

For technical support by phone, call (919) 677-8008. Electronic methods for contacting SAS Technical Support are available 24 hours a day, 7 days a week.

Note: Make sure you have the following information available when contacting SAS Technical Support:

- your SAS site number
- your operating system and version number
- any errors you received during installation

If you are a non-U.S./Canadian customer, contact your SAS Representative for the SAS office nearest you. For technical support by mail, address all correspondence to:

SAS
Technical Support Division
SAS Campus Drive
Cary, N.C. 27513-2414

Electronic mail access is available through the Electronic Mail Interface to Technical Support (EMITS). This facility allows you to open a technical support problem, track it, and/or add
information to a previously reported problem. To obtain more information on EMITS, send electronic mail to SUPPORT@SAS.COM with the body of the message containing the command:

   Help

What’s New

Visit the new Web page http://www.sas.com/newversion for information about what is new in Release 8.2 of SAS Software. You can browse or print What’s New in SAS Software, Release 8.2 and follow links to additional documentation. Visit this site often for the most up-to-date information about Release 8.2. If you prefer to access Release 8.2 documentation on CD-ROM, contact the SAS Distribution Center at 919-531-7851. To purchase the hardcopy book, contact SAS Fulfillment Services at 800-727-3228.

Contracts Customer Service

For questions related to your organization’s customer licensing relationship with SAS, please contact Contracts Customer Service. This department can help with non-technical questions related to hardware configuration and SETINIT issues, such as verifying SETINIT information and requesting SETINIT extensions.

You can access Contracts Customer Service via the Internet, telephone, mail, dial-up computer access, or electronic mail. For Contracts Customer Service via the Internet, please use the following URL:

   http://www.sas.com/service/contracts/intro.html

For Contracts Customer Service by phone, please call (919) 677-8003 or (800) 727-0025 between the hours of 9:00 a.m. and 8:00 p.m., Eastern Time, on business days. Electronic methods for contacting Contracts Customer Service are available 24 hours a day, 7 days a week.
Chapter 2, Installing the SAS® System

SAS Setup is provided on your installation media and is used to install and maintain your SAS System. This chapter describes SAS Setup and how to use it, as well as how to load and maintain the SAS System.

SAS Setup

SAS Setup is a set of scripts supplied with the installation media that provides a menu-driven interface for installing and maintaining the SAS System. When launched, SAS Setup first performs a series of tests to make sure it can run properly and then guides you through a series of menus. A SAS Setup installation has three distinct phases:

- **Prompting**
  using a series of menus, prompts you for all the information necessary to complete the installation.

- **Loading**
  loads all selected software to a specified location.

- **Post-Processing**
  performs SAS System and product-specific configuration. This phase occurs automatically after all software has been loaded.

SAS Setup is loaded along with any selected software to the specified destination. You can invoke SAS Setup directly from the installation media, or from !SASROOT after the installation is complete.

During the prompting phase of installation, you are prompted for information before any actual loading or post-processing occurs. Before anything is loaded, you can exit at any time.

*Note:* You must use SAS Setup to install the SAS System. Using another installer will result in errors.

Important Files

SAS Setup uses several control files to accomplish its tasks and log its progress. These files should not be deleted or modified because they may be used in subsequent installations or in maintaining your existing installation.
TOC File
a control file used by SAS Setup to serve as an index of the installable components. It is shipped on the installation media and is copied to !SASROOT/.install/tocs during an installation.

Config File
a file containing SAS System options that take effect when the SAS System is invoked. SAS Setup creates default config files during installation, for example !SASROOT/sasv8.cfg.

History File
a SAS Setup control file containing the history of the components that were loaded during the installation process. The history file is located in your !SASROOT/.install directory.

Log Files
files created by SAS Setup that contain useful diagnostic information about any errors that may have occurred during the installation process. These files are located in your !SASROOT/.install/logs and !SASROOT/.install/logs_sh directories. In addition to install log files, you can also find log files in !SASROOT/.install/sas for the actual SAS programs that run during configuration.

Run Script
a SAS Setup control file containing all of the responses you provided to prompts during the installation process. This file can be used as input for subsequent installations. The run script is located in !SASROOT/.install/script.

SAS Setup
a set of scripts used to install and maintain the SAS System. When the SAS System is loaded, SAS Setup is named !SASROOT/sassetup, and its components are found in !SASROOT/install.

Installation Overview
A typical SAS System installation involves the following steps:

1. Prerequisites: Review your product package to make sure it is appropriate for your site. Make sure your system is properly backed up. Review the Alert Notes, System Requirements and Installation Instructions prior to installing the software.

2. Environment: Make sure your system has adequate memory and free disk space to complete the installation. Be sure you have the ability to mount the media and write files to the installation directory. Make sure your system meets the operating system specifications outlined in the System Requirements document.
3. **Installation**: Run SAS Setup from your installation media to install the SAS System Solutions appropriate for your site.

4. **Post-Installation**: Complete post-installation steps to make the SAS System available for use at your site. Please see Chapter 3 “Post-Installation Instructions” on page 17 for instructions about the steps to complete.

5. **Client Installations**: You have the option of installing additional components of the SAS System found on the Client-Side Components CD, the SAS OnlineDoc CD and/or the SAS/GIS Census Tract Maps CD. Refer to the documentation included for each of these CDs for requirements and installation instructions.

## Installation Requirements

SAS Setup requires certain information to complete an installation successfully. Before you run SAS Setup to install software, the following information must be obtained:

- **Operating System Version**
  
  Determine which version of the operating system is being used for this installation. Compare the version with those listed in the *System Requirements* to make sure you are installing on a supported version of the operating system.

- **Source Directory**
  
  Determine the directory path of the installation source directory. This is typically the mount point of a CD-ROM device. Make sure you know the path of the device for proper mounting.

- **Destination Directory**
  
  Determine where you want to install the software. Make a note of the full path of your destination directory so you can provide the information when SAS Setup asks for it. Make sure there is adequate free disk space available on the destination disk. You can estimate the disk space requirements from the “Space Requirements” section listed in the *System Requirements*.

- **Installation Scenario**
  
  Know which type of installation you intend to perform prior to running SAS Setup. Some basic installation scenarios are outlined below:

  - **New**
    
    In this scenario you can choose to Load All Software from Media or Load Selected Software. A new installation requires a destination directory that is empty. SAS Setup will create a directory if you specify a destination that does not exist.

  - **Upgrade**
    
    In some cases, you are allowed to install an upgrade directly into an existing SAS System installation. However, we recommend that you always load upgrades into a separate
location. This allows you to run both the existing system and the upgraded system in parallel.

There are two types of upgrade installations: a Major Upgrade and a Minor Upgrade.

**Major Upgrade**
A Major Upgrade involves installing a higher release of the SAS System than that of the existing installation. An example would be upgrading SAS System Release 6.12 to Release 8.2. SAS Setup does not allow you to load a major upgrade into your existing installation. A new destination directory must be chosen, along with the selection of **Load All Software from Media** or **Load Selected Software**.

**Minor Upgrade**
A Minor Upgrade provides an existing installation of the SAS System with an updated version of the same release. An example would be upgrading the SAS System Version 8 production release to an enhanced Version 8 release. In the Minor Upgrade scenario, specify your existing installation root directory as the destination directory and choose to **Load All Software from Media** or **Load Selected Software**.

- **Addon**
  An Addon installation loads additional products to an existing installation of the same release. An example of an Addon installation would be choosing to load SAS/GRAPH Software to an existing installation containing Base SAS, SAS/AF, and SAS/FSP Software. Specify your existing installation root directory as the destination directory and choose **Load Selected Software**. Then choose the Addon products that you want to load.

- **NLS Only**
  An NLS Only scenario restricts installation to NLS components for the products in an existing installation. NLS Only can be chosen if you receive media with NLS translations for products currently installed. Specify your existing installation root directory as the destination directory and choose **Load NLS Translations Only**. You may also choose **Load Selected Software** or **Load All Software from Media** to load NLS translations.

**Launching SAS Setup**

The SAS System can be installed in any location with sufficient space. When you launch SAS Setup and choose to load software, the program prompts you for a source location of the media and a destination location (referred to as **SASROOT**) in which to install the SAS System. SAS Setup will verify that the specified directory is valid before proceeding with the install.

Complete the following steps to launch SAS Setup directly from the installation media:

1. Locate the CD labeled **Installation Disk** and insert it in your CD-ROM drive. If your system uses an automount feature, you may skip to Step 5 below since the CD will be automatically mounted for you.
2. Mounting a CD requires root privilege on UNIX. Log in as root to manually mount the CD.

3. Create a local directory in which to mount your CD:

   mkdir /cdrom

   Note: These instructions assume your CD is mounted as /cdrom. However, you may choose another location and substitute that location appropriately in these instructions.

4. Mount the CD using one of the following examples appropriate for your system. Substitute the actual device names where appropriate in the examples shown. This release of the SAS System supports ISO-9660 CD-ROM and Rockridge extensions where available.

   For ABI+ for Intel® Architecture

   mount -F cdfs -O ro /dev/cd0 /cdrom

   For AIX

   mount -r -v cdrfs /dev/cd0 /cdrom

   For Compaq Tru64 UNIX

   mount -rt cdfs -O noversion,rrip /dev/cd0 /cdrom

   For HP-UX

   mount -r /dev/cd0 /cdrom

   For IRIX

   mount -t cdfs -O ro /dev/cd0 /cdrom

   For Linux

   mount -r /dev/cd0 /cdrom

   Note: Some Linux systems may require you to specify a file system type using the -t flag on the mount command.
For Solaris

```
mount -r -F hsfs /dev/cd0 /cdrom
```

These instructions assume you have a local CD-ROM drive. However, if your CD-ROM drive resides on another host, mount the CD using NFS by issuing a command similar to the following:

```
mount -o ro <remotehost>:/<cd-rom-dir> /cdrom
```

where `<remotehost>` refers to the machine that owns the CD-ROM drive, and `<cd-rom-dir>` is the actual mount point for the CD-ROM drive on the server. The commands for your host may differ.

For ABI+ for Intel® Architecture

**Note:** You may see unexpected behavior if you mount from an ABI+ for Intel® Architecture CD-ROM drive to a host other than ABI+ for Intel® Architecture.

For HP-UX

**Note:** You may see unexpected behavior if you mount from an HP-UX CD-ROM drive to a host other than HP-UX.

5. Invoke SAS Setup from the CD as shown in the following example. Do not change your working directory to the `cdrom` directory, or SAS Setup will fail when attempting to mount subsequent media.

```
/cdrom/SASSETUP
```

Some file systems may show SAS Setup as a VMS-style file or in lowercase. In these cases, invoke SAS Setup using:

```
/cdrom/SASSETUP.
```

or

```
/cdrom/sassetup
```

**Note:** You are not required to run SAS Setup directly from the installation media. If you have previously installed this release of the SAS System, you can launch SAS Setup from this location:
!SASROOT/sassetup

where !SASROOT refers to the root directory of your previous installation.

6. Provide the information requested from prompts and menus to complete the installation. SAS Setup will prompt you to mount any additional media required for the installation.

Note that you are in the loading phase of the install at the point when SAS Setup asks you to mount additional media, and the Goback command is disabled. However, you have the ability to invoke a subshell at the media prompts by entering ! at the prompt. From the subshell, you can mount and unmount media, clean up disk space, etc. You must exit the subshell to continue the installation.

The next several sections outline the menu choices available to you and the conventions used when navigating through them.

Menu Conventions

The following conventions are used in the menus throughout the installation process:

* indicates the default selection

[ ] indicates the default choice

( ) indicates an item is not selectable

G go back to a previous menu or prompt

Q quit the install and exit

H, H#, #H displays help on an item or menu

The following conventions are used to make custom selections throughout the installation process:

n next screen

p previous screen

# select numbered item

-# deselect numbered item

* select all items

-** deselect all items

### select range of items

-### deselect range of items

Return continue
Primary Menu

The first menu presented from SAS Setup is the primary menu, which gives you the choice of loading software or running utilities to maintain your existing installation. The SAS Setup primary menu contains the following options:

- **Load Software From Media**
  allows you to choose software to load from the media.

- **Run Setup Utilities**
  allows you to maintain your installed SAS System by running utilities that configure and update your system.

- **Quit SAS Setup**
  exits SAS Setup.

Loading Software

When you choose **Load Software From Media** from the SAS Setup primary menu, the load software menu is presented. You can then choose from the following options:

- **Load All Software From Media**
  loads the entire contents of your media.

- **Load Selected Software**
  loads components based on your custom selections.

- **Load NLS Translations Only**
  loads only NLS translations for products in an existing installation.

Loading Selected Software

Selecting **Load Selected Software** allows you to load software based on your custom selections. You can then use the menus that follow to choose which product components will be installed. Selecting components from these menus is cumulative. You have the option of viewing or clearing your selections at any time before you choose to install the current selections.

- **Select National Language Support (NLS)**
  allows you to select components of the SAS System translated into languages other than English.

- **Select Software Updates**
  allows you to select which software solutions will be loaded.

- **Select Products**
  allows you to select among all the products for which your site is licensed.

- **Select Samples**
  allows you to select among all the sample programs for products for which your site is licensed.
Select Maps
allows you to select which SAS/Graph Map Datasets you want to install.

Preview Selections
displays a list of your current custom selections.

Install Current Selections
installs your current custom selections.

Clear All Selections
clears your current custom selections.

Setup Utilities
When you select Run Setup Utilities from the SAS Setup primary menu, the following utility options are available. The utilities are used to modify or maintain an existing installation. Unlike the loading options, the utilities are all executed as you select them.

Perform SAS System Configuration
configures the SAS System for use.

Perform Product Specific Configuration
configures specific product components for use.

Run Technical Support Tools
runs various tools provided by Technical Support.

List Previously Installed Products
lists products that have been previously installed.

SAS System Configuration
SAS Setup allows you to maintain your installation by providing access to all the configuration steps required when changes occur to your SAS System installation. This menu allows you to perform SAS System configuration steps.

Create New Config Files
creates a new sasv8.cfg file, which contains site-specific configuration options.

Patch the SAS Executable Image
patches the SAS executable with the current installation location, which tells the SAS System where to find the SASROOT directory.

Apply SETINIT to Authorize the SAS System
applies SETINIT information to authorize your SAS System installation for use.

Update SAS Registry Information
creates a new SAS Registry used by the SAS System.
Run Installation Tests
run test programs to certify your installation.

Uncompress Map Data Sets
uncompresses map datasets that are loaded in compressed format to save disk space. The maps are not useful until they are uncompressed.

Create the SAS online Help Indices
builds index files for the SAS online help system based on the products you loaded.

Configure User Authorization
authenticate a client’s identity and its authority to access resources.

Update Default Language Setting
modify the default language of your SAS System installation.

Product Specific Configuration

Some products or components require special configuration to function properly. This menu allows you to select which product specific configuration you want to perform.

SAS/ACCESS Configuration
configures and tests access to external databases using SAS/ACCESS products.

Desktop Configuration
creates data sets required by the SAS Desktop and other products.

Specify SAS OnlineDoc Location
updates the config file with the location of the SAS OnlineDoc.

Update SAS/IntrNet Services Configuration Program
updates the SAS/IntrNet configuration scripts for use on your local SAS System installation.

Specify SAS/GIS Census Tract Maps Location
updates the config file with location of SAS/GIS Census Tract maps installed or mounted on your system.
Chapter 3, Post-Installation Instructions

Now that you have loaded your SAS software, you need to complete the appropriate configuration steps for your installation, listed below, to make the system available for use.

The following items are discussed in this chapter:
- Making the SAS System Available
- Invoking SAS Software
- Modifying Your Configuration File
- Adjusting Memory Settings
- Accessing a Web Browser
- Installing Man Pages
- Configuring User Authorization
- Using SAS/GRAPH Software Map Datasets
- Applying SETINIT to Authorize the SAS System
- Running the SAS System With the X Window System
  - The XkeysymDB File
- Maintaining Your Installation
- The Directory Structure of the SAS System

Making the SAS System Available

Once you have loaded the SAS System, you need to make it available to your users. You can use either of the following two methods to accomplish this:

- Make a symbolic link from the SAS command (sas) to a directory that is already in your users’ default search path by issuing a command similar to the following:

  \[ \text{ln -s /usr/local/sas8/sas /usr/bin/sas} \]

  where /usr/local/sas8 is your SASROOT location.

  \textbf{Note:} We recommend using this method because it is flexible and easy to maintain.

- Edit each user’s shell startup scripts so that the SASROOT directory is included in the search path.

  \textbf{Note:} Commands used to set your $PATH environment variable may be different from these examples, based on how you have defined your $PATH environment variable.

  For example, for Bourne Shell users change the following line in $HOME/.profile:

  \[ \text{PATH=/bin:/usr/bin:/usr/local/bin:} \]
Invoking SAS Software

When you have completed making the SAS System available for use, you can invoke it from the UNIX command line as follows:

```bash
sas <options>
```

where `<options>` are valid SAS command line options.

Depending on your site, you may have more than one invocation point available in which to run the SAS System. This can occur if you install NLS localizations or asynchronous addon products (products that load entirely into a separate subdirectory for various reasons). You must make any alternative invocation points available to your users in a similar fashion to the examples listed in the previous section.

The invocation point for an asynchronous addon product is:

```bash
!SASROOT/sas_addon/sas
```

If you install NLS localizations, SAS Setup will create invocation scripts automatically in the SASROOT directory that will launch the appropriate executable. The invocation scripts allow you to look no further than the SASROOT directory to launch any localizations you install. Within SASROOT, the invocation script file:

```bash
sas_<language>
```

launches the executable:

```bash
!SASROOT/nls/<language>/sas
```

where `<language>` is the language code for the localization you want to run. For example, the invocation script for the French version of the SAS System is:

```bash
sas_fr
```

which launches:

```bash
!SASROOT/nls/fr/sas
```

Below is a list of the valid language and language codes.
In addition, DBCS Asian language support exists for language localizations that require it. If DBCS has been installed, SAS Setup will also automatically create an invocation script in the $SASROOT$ directory that will launch the DBCS executable. Within $SASROOT$, this invocation script file

`sas_dbcs`

launches the executable:

`!SASROOT/dbcs/sas`

**Restoring Your Configuration File**

A default configuration file, `!SASROOT/sasv8.cfg`, is created during the installation of the SAS System. To modify this config file to fit your needs, refer to *SAS Companion for UNIX Environments* for information on how to customize the SAS configuration file.

If you modify your config file and then want to restore the default version, follow these steps:

1. Run `!SASROOT/sassetup`. Make sure you have the appropriate privilege to update a file in $SASROOT$.
2. Select Run Setup Utilities from the SAS Setup Primary menu.
4. Select Create New Config Files.
Adjusting Memory Settings

The `MEMSIZE` option is set in the `sasv8.cfg` file. It controls the maximum amount of virtual address space an individual SAS System session will use. Each session uses only as much virtual address space as it needs and never uses more than the `MEMSIZE` option dictates. Many procedures will have improved performance if the `MEMSIZE` is raised. However, the `MEMSIZE` option should never be set to a value so high that the amount of physical RAM on the server would be exceeded if every SAS session used the maximum allowed.

You may also specify the `SORTSIZE` option to limit the amount of memory available to the `SORT` procedure.

The default settings for `MEMSIZE` and `SORTSIZE` are listed below:

- **32-bit systems (ABI+ for Intel Architecture, AIX, HP-UX, IRIX, Linux, and Solaris)**
  - `MEMSIZE` = 64M
  - `SORTSIZE` = 48M

- **64-bit systems (AIX, Compaq Tru64 UNIX, HP-UX, and Solaris)**
  - `MEMSIZE` = 96M
  - `SORTSIZE` = 80M

For more information on the `MEMSIZE` and `SORTSIZE` options, refer to the *SAS Companion for UNIX Environments*.

Accessing a Web Browser

Netscape Communicator is required with this release of the SAS System for UNIX Environments. The Netscape path should either be in each user’s `$PATH` setting, or set in the X Windows resource/application default `SAS.helpBrowser` (for example, `SAS.helpBrowser:/usr/local/netscape-4.06/netscape`).

You may receive authorization failures using Netscape to view ODS output. These errors are corrected by completing the steps in the section “Configuring User Authorization” below.

Installing Man Pages

This release includes manual pages (referred to as “man pages”) that should be installed. Refer to your system documentation on how to install new man pages. The SAS man pages are in the directory `!SASROOT/utilities/man`.

Configuring User Authorization

In order to authenticate a client’s identity and check the client’s authority to access resources, some setup is required by the root account. This setup changes the `setuid` permissions of files in `!SASROOT/utilities/bin` to `root`. If you installed the SAS System from the root account, SAS Setup performed this task automatically. Otherwise, you can perform this task using either of the following methods:
Using SAS Setup, follow these steps:

1. Run `!SASROOT/sassetup` from the root account.
2. Select Run Setup Utilities from the SAS Setup Primary Menu.
4. Select Configure User Authorization

or,

Manually, execute the following commands at the system command line:

```
su root
cd !SASROOT/utilities/bin
chown root sasauth sasperm sastcpd objspawn
chmod 4755 sasauth sasperm sastcpd objspawn
exit
```

Note: The file `objspawn` is installed along with the SAS/Integration Technologies product and therefore may not be present on your system.

For ABI+ for Intel® Architecture

For ABI+ for Intel® Architecture compliant systems, `sasauth` is used to determine which system you are running on and the ownership and permissions should not be modified. Instead, you must modify the `sasauth` executable for each of the supported systems, as follows:

```
su root
cd !SASROOT/utilities/bin
chown root sasauth.* sasperm sastcpd objspawn
chmod 4755 sasauth.* sasperm sastcpd objspawn
exit
```

Using SAS/GRAPH Software Map Data Sets

The maps provided on the distribution media have been compressed to reduce the amount of disk space required to install them. SAS/Graph map data sets are loaded in `!SASROOT/maps`, and compressed map data sets have a `.Z` extension. If you want to use the maps, they must be uncompressed. You can uncompress them during the install process, or at a later time by following the steps below:
1. Run `!SASROOT/sassetup`. Make sure you have the appropriate privilege to update files in `!SASROOT`.

2. Select Run Setup Utilities from the SAS Setup Primary Menu.


4. Select Uncompress Map Data Sets.

Applying SETINIT to Authorize the SAS System

The SAS System requires the application of SETINIT information before your licensed software will run. This authorization process takes place whenever you contract to renew your existing SAS System or add additional products to your site license.

Your SETINIT information should be applied when you receive new SETINIT data from your SAS Contracts Administrator.

Note: You should not change the SETINIT information unless you are the SAS System administrator.

For AIX, HP-UX and Solaris

Beginning in Release 8.2, the SAS System is offered in both 32 and 64 bit enabled implementations for AIX, HP-UX and Solaris. If your site has both implementations installed, it is important that you apply the correct SETINIT to each installation.

If you are not sure if your system matches your SETINIT, you can compare the `OSNAME` field in your SETINIT text with the value returned when you run the following SAS statements:

```sas
%put &sysscp;
```

If the values match, then it is safe to apply the SETINIT to that installation.

Complete the following steps to apply your SETINIT. Note that `!SASROOT` refers to the directory path of your SAS System installation.

1. Create or modify a SETINIT file. Be sure the SETINIT file exactly matches the updated information you received from your SAS Contracts Administrator.

   Note: Your original SETINIT file is `!SASROOT/setinit.sas`. You can use this file as a template.

2. Run `!SASROOT/sassetup`. Make sure you have appropriate privilege to update files located in the SASROOT directory.
3. Select Run Setup Utilities from the SAS Setup Primary Menu.

4. Select Perform SAS System Configuration.

5. Select Apply SETINIT to Authorize the SAS System. Specify the location of the SETINIT file you have created or modified when prompted.

6. If errors occur, a message will be displayed indicating the log files to be checked. If the SETINIT applies successfully, you can enter Q to quit sassetup and run SAS normally.

We recommend using the previous method of applying your SETINIT information. However, if you wish to apply your SETINIT manually, you can follow these steps:

1. Copy your original file, setinit.sas, and rename it, for example, setinit.old. Then edit your setinit.sas file and add any new or modified information.

2. Apply the SETINIT file by issuing the command from the !SASROOT directory:

   ./sas -setinit ./setinit.sas

3. A log file, setinit.log, will be created in the !SASROOT directory. Check the log file for the following note:

   NOTE: Siteinfo data have been updated.

If there are no errors in the log, you can disregard any other notes or warnings in the setinit.log file. If you do find error messages, check the setinit.sas file for extraneous characters (such as misspellings, carriage returns or line feeds) that might have been introduced when you edited the file. Make any corrections that are needed, save the file, and then execute the command in Step 2 above.

If you have questions about your SETINIT data, please call our Customer Service Department at (919) 677-8003 between 9:00 a.m. and 8:00 p.m. Eastern Time.

If you encounter problems applying your SETINIT, and you are a U.S. or Canadian customer, please call our Technical Support Division at (919) 677-8008. Ask the Technical Receptionist for a UNIX consultant. Please have your site number ready when you call.

If you are a non-U.S./Canadian customer with a problem applying your SETINIT, please contact your SAS Representative for the SAS office nearest you.

**Running the SAS System with the X Window System**

The SAS System includes a user interface based on the X Window system. On most systems, the SAS System functions correctly and completely without altering the files that manage the interface. However, if you want to customize the interface, follow the instructions included in this section.
The OSF/Motif Interface to the SAS System makes an attempt to recognize the type of X server on which the interface is displayed so that the proper key definitions can be established. The vendor string supplied with the server can recognize many X servers. You can examine this string with the `xdpyinfo` program which should be in the X Windows bin directory on your system.

Many of the files in `!SASROOT/X11/resource_files` contain the definitions used for the various X servers. You do not need to do anything with these files. However, users who want to customize the keys for an X server may find these files useful as a starting point.

The file `!SASROOT/X11/resource_files/Resource_Defaults` documents the default values given to the SAS application resources that do not vary for different servers. Again, this file does not need to be installed, but is provided as a reference for those wanting to do their own customization of these interfaces.

For more information on the OSF/Motif Interface, refer to Chapter 3, “Customizing the SAS Windowing Environment,” in *SAS Companion for UNIX Environments, Version 8, First Edition*.

**The XKeysymDB File**

Some sites may need to update the `XKeysymDB` file when they install the SAS System. This section explains what this file is, who needs to update it, and how to update it.

The `XKeysymDB` file is a database of X keysym names, and is used by the OSF/Motif Interface to the SAS System, and many other X clients. Your site will already have a version of this file. However, it may not contain all of the vendor-defined keysym names that are used with the OSF/Motif Interface to the SAS System. The SAS version of the `XKeysymDB` file includes the keysyms defined by the various X server vendors, as well as the virtual keysyms used by OSF/Motif.

You only need to install the SAS-supplied `XKeysymDB` file if you see warnings containing the phrase `unknown keysym` when you execute this release of the SAS System.

**Using the XKeysymDB File**

You can use the SAS System `XKeysymDB` file in either of the following ways:

- **Method 1**
  
  replaces the existing `XKeysymDB` file. (You must have root permission to perform this task.) When you enter the following commands, replace the variables `!SASROOT` and `$LIBDIR` with the directory names used on your system.

  The `!SASROOT` variable indicates the directory where the SAS System is installed. The `$LIBDIR` variable indicates the directory containing the `XKeysymDB` file. For most systems, the `$LIBDIR` directory should be `/usr/lib/X11`. 
For Solaris

The $LIBDIR directory should be /usr/openwin/lib.

Once you have determined the values for these variables, enter the following commands:

    cd $LIBDIR
    mv XKeysymDB XKeysymDB.old
    cp !SASROOT/X11/resource_files/XKeysymDB .

If the new XKeysymDB file was installed correctly, you should no longer see any messages about unknown keysyms when you run the SAS System.

Method 2

defines the XKEYSYMDB environment variable to point to this version of the file. X clients, including the SAS System, can then use this one instead of the system version.

For example, if you installed the SAS System in /usr/local/sas8, you can define the XKEYSYMDB environment variable as follows:

- For Bourne or Korn shells:

      XKEYSYMDB=/usr/local/sas8/X11/resource_files/XKeysymDB
      export XKEYSYMDB

- For C Shell:

      setenv XKEYSYMDB /usr/local/sas8/X11/resource_files/XKeysymDB

Maintaining Your Installation

SAS Setup is automatically loaded along with your SAS System installation. You should use SAS Setup to maintain your installation by choosing the Run Setup Utilities option from the SAS Setup Primary menu. Each of the utility options available are briefly discussed in Chapter 2 of this document.

Once the SAS System is installed at your site, you should not directly modify any files in the SASROOT directory. Any user modifications to files in SASROOT should be maintained in a location other than SASROOT or the !SASROOT/sascfg directory. When you update your installation at a later date, it is your responsibility to take any previously made user modifications and reintegrate them into the system.
The Directory Structure of the SAS System

The following subdirectories are created when the SAS System is installed. This information is provided for reference only. No post-processing is needed in this section.

The SAS System is installed in a root directory referred to as SASROOT. Within the SASROOT directory is the invocation point, configuration file, SETINIT file, a copy of SAS Setup and all the related subdirectories, described below:

doc
   contains the Alert Notes, System Requirements, and Installation Instructions in various formats. See the README file for information on how to browse and print these files.

install
   contains all of the scripts and data files for SAS Setup.

.install
   contains configuration information about your current SAS System installation, including install logs, history files, and TOC entries. Do not remove or modify the contents of this directory, as doing so will result in incorrect behavior of SAS Setup.

sascfg
   contains site-specific SAS System configuration information.

sasexe
   contains the executable SAS software files for all of your installed products.

sashelp
   contains data sets, data views, catalogs, etc.

sasmsg
   contains the SAS message files.

saspgm
   contains miscellaneous files for several products.

sasautos
   contains the SAS macro files.

X11
   contains bitmaps, X resource files, and SAS help files.

maps
   contains the SAS/GRAPH software map data sets.

gismaps
   contains the SAS/GIS census tract maps.
misc
contains miscellaneous files such as product-specific on-line documentation, scripts for use with SAS/CONNECT, SAS/GRAPH drivers, applets, and other miscellaneous items.

samples
contains the Sample Library programs.

sastest
contains the installation test programs.

utilities
contains utility files in these subdirectories:
- bin
  contains useful tools such as the `patchname` and `cleanwork` commands.
- man
  contains the SAS man pages that you can make available on your system.

In addition to the standard SASROOT tree, you may have similar tree structures within SASROOT if you install any NLS language localizations or asynchronous addon products. In these situations, there will be a configuration file within the subtree that sets the proper path information to look through to the main SASROOT tree.
Appendix A, Post-Installation Validation for SAS/ACCESS® Interface Software

For each SAS/ACCESS interface that you want to use at your site, you can execute a validation process specific to your Data Base Management System (DBMS), which validates SAS/ACCESS images against your DBMS. Please read this appendix before executing the validation procedure, so you can provide the correct information for validation.

You can either run the validation during installation of your SAS/ACCESS interface software or as a post-installation step at a later time. Refer to the System Requirements document provided in your installation package to determine if the combination of your operating system and the version of your DBMS is supported by the SAS/ACCESS interface you are validating.

Whether you run the validation during installation or as a post-installation step, you must set the appropriate environment variables prior to validating the software. Before beginning the validation process, you should know the following information about your DBMS:

- The version of the DBMS client libraries installed on your system, required due to incompatibilities between DBMS versions.
- The DBMS root directory of your client install, required so the validation procedure can find the DBMS shared libraries to test the SAS/ACCESS interface.

You are automatically prompted for this information if you choose to complete validation during installation. But, if you choose to run validation as a post-installation step, follow these instructions.

1. Run SAS Setup located in the SASROOT directory. Make sure you have appropriate privilege to write to files in this directory:

   !SASROOT/sassetup

2. Select Run Setup Utilities from the Primary menu.

3. Select Perform Product Specific Configuration from the Utilities menu.

4. Select SAS/ACCESS Configuration from the Product Specific Configuration menu.

5. Choose the SAS/ACCESS Interface you wish to validate.

6. Provide any information requested by prompts. You will be notified about the success or failure of the validation.

Refer to the following sections appropriate for your DBMS for detailed instructions on validating your SAS/ACCESS interface software.
Validating the SAS/ACCESS Interface to DB2®

Refer to the System Requirements document provided in your installation package to find the exact releases supported by SAS/ACCESS software for UNIX environments.

The SAS/ACCESS Interface to DB2 executable uses shared libraries. You must add the location of the DB2 shared libraries to one of the system environment variables below, and if necessary indicate the DB2 version that you have installed at your site.

**Note:** The validation process allocates the shared libraries for you based on the DBMS information you provide for your client install. The environment variables below must be set before you can use the SAS/ACCESS interface. You must also set the INSTHOME environment variable to your DB2 DBMS home directory before setting the environment variables as shown in the example code below.

---

**For AIX**

Set LIBPATH to point your DBMS shared library as shown in the following examples:

- For Bourne Shell
  
  LIBPATH=$INSTHOME/lib:$LIBPATH
  
  Export LIBPATH

- For C Shell
  
  setenv LIBPATH $INSTHOME/lib:$LIBPATH

---

**For HP-UX**

Set SHLIB_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell
  
  SHLIB_PATH=$INSTHOME/lib:$SHLIB_PATH
  
  export SHLIB_PATH

- For C Shell
  
  setenv SHLIB_PATH $INSTHOME/lib:$SHLIB_PATH
For Linux and Solaris

Set LD_LIBRARY_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell

  ```
  LD_LIBRARY_PATH=$INSTHOME/lib:$LD_LIBRARY_PATH
  export LD_LIBRARY_PATH
  ```

- For C Shell

  ```
  setenv LD_LIBRARY_PATH $INSTHOME/lib:$LD_LIBRARY_PATH
  ```

Validating the SAS/ACCESS Interface to INFORMIX®

Refer to the Systems Requirements document provided in your installation package to find the exact releases of INFORMIX supported by SAS/ACCESS software for UNIX environments.

The SAS/ACCESS Interface to INFORMIX executable uses shared libraries. You must add the location of the INFORMIX shared libraries to one of the system environment variables below and, if necessary, indicate the INFORMIX version you have at your site.

**Note:** The validation process allocates the shared libraries for you based on the DBMS information you provide for your client install. The environment variables below must be set before you can use the SAS/ACCESS interface. You must also set the INFORMIXDIR environment variable to your INFORMIX DBMS home directory before setting the environment variables as shown in the example code below.

For AIX

Set LIBPATH to point your DBMS shared library as shown in the following examples:

- For Bourne Shell

  ```
  LIBPATH=$INFORMIXDIR/lib:$INFORMIXDIR/lib/esql:$LIBPATH
  export LIBPATH
  ```

- For C Shell:

  ```
  setenv LIBPATH $INFORMIXDIR/lib:$INFORMIXDIR/lib/esql:$LIBPATH
  ```
For HP-UX

Set SHLIB_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell

  \[SHLIB\_\text{PATH}=$\text{INFORMIXDIR}/\text{lib}:\text{INFORMIXDIR}/\text{lib/\text{esql}}:\text{SHLIB\_PATH}\]
  \[\text{export SHLIB\_PATH}\]

- For C Shell

  \[\text{setenv SHLIB\_PATH}\]
  \[\$\text{INFORMIXDIR}/\text{lib}:\text{INFORMIXDIR}/\text{lib/\text{esql}}:\text{SHLIB\_PATH}\]

For Compaq Tru64 UNIX and Solaris

Set LD_LIBRARY_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell

  \[LD\_\text{LIBRARY\_PATH}=$\text{INFORMIXDIR}/\text{lib}:\text{INFORMIXDIR}/\text{lib/\text{esql}}: \text{LD\_LIBRARY\_PATH}\]
  \[\text{export LD\_LIBRARY\_PATH}\]

- For C Shell

  \[\text{setenv LD\_LIBRARY\_PATH}\]
  \[\$\text{INFORMIXDIR}/\text{lib}:\text{INFORMIXDIR}/\text{lib/\text{esql}}:\text{LD\_LIBRARY\_PATH}\]

Validating the SAS/ACCESS Interface to CA-OpenIngres® Software

To successfully validate the SAS/ACCESS Interface to CA-OpenIngres Software, you must have access to CA-OpenIngres Software either through a server or client installation. Refer to the System Requirements document provided in your installation package to find the exact releases supported by SAS/ACCESS under the different operating systems.

The SAS/ACCESS Interface to CA-OpenIngres Software executable uses shared libraries. You must add the location of the CA-OpenIngres Software shared libraries to one of the system environment variables below, and if necessary indicate the CA-OpenIngres Software version that you have installed at your site.
For AIX

Set LIBPATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell
  
  ```
  LIBPATH=$II_SYSTEM/lib:$LIBPATH
  export LIBPATH
  ```
- For C Shell
  
  ```
  setenv LIBPATH $II_SYSTEM/lib:$LIBPATH
  ```

For Compaq Tru64 UNIX, ABI+ for Intel® Architecture, and Solaris

Set LD_LIBRARY_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell
  
  ```
  LD_LIBRARY_PATH=$II_SYSTEM/ingres/lib:$LD_LIBRARY_PATH export LD_LIBRARY_PATH
  ```
- For C Shell
  
  ```
  setenv LD_LIBRARY_PATH $II_SYSTEM/lib:$LD_LIBRARY_PATH
  ```

For HP-UX

Set SHLIB_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell
  
  ```
  SHLIB_PATH=$II_SYSTEM/lib:$SHLIB_PATH
  export SHLIB_PATH
  ```
Validating the SAS/ACCESS Interface to Microsoft SQL Server

Before you can use the SAS/ACCESS Interface to Microsoft SQL Server, the following products are required:

- Base SAS software
- SAS/ACCESS Interface to Microsoft SQL Server
- Microsoft SQL Server Version 7.0

The SAS/ACCESS product contains the Merant Microsoft SQL Server ODBC driver component that is unloaded when you installed the SAS/ACCESS Interface to Microsoft SQL Server Product. The setup/configuration procedures are described below:

**ODBCHOME** – defines the location where you unloaded the Merant Microsoft SQL Server drivers during the SAS System installation.

You will have to edit the `.odbc.ini` file with a text editor to configure data sources. A sample of an `.odbc.ini` file, it will need to be made available to the SAS/ACCESS Interface to Microsoft SQL Server.

The Merant Microsoft SQL Server ODBC drivers are ODBC API-compliant shared libraries, referred to in UNIX as shared objects. You must include the full path to the shared libraries in the shared library path as shown below so that the ODBC drivers can be loaded dynamically at runtime. Also note that you may have to include your DBMS shared library path as described in the DBMS-specific section. You must also set the **ODBCHOME** environment variable to your ODBC home directory before setting the environment variables as shown in the example code below.

**Note:** The ODBC home directory is the path you specified when you installed the SAS/ACCESS to Microsoft SQL Server Product.

For AIX

Set LIBPATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell:

  ```
  LIBPATH=$ODBCHOME/lib:$LIBPATH
  export LIBPATH
  ```

- For C Shell

  ```
  setenv LIBPATH $ODBCHOME/lib:$LIBPATH
  ```
For Solaris

Set LD_LIBRARY_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell

  \[ \text{LD_LIBRARY_PATH}=\$ODBCHOME/lib:LD_LIBRARY_PATH \]
  \[ \text{export } \text{LD_LIBRARY_PATH} \]

- For C Shell

  \[ \text{setenv } \text{LD_LIBRARY_PATH } \$ODBCHOME/lib:LD_LIBRARY_PATH \]

For HP-UX

Set SHLIB_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell

  \[ \text{SHLIB_PATH}=\$ODBCHOME/lib:SHLIB_PATH \]
  \[ \text{export } \text{SHLIB_PATH} \]

- For C Shell

  \[ \text{setenv } \text{SHLIB_PATH } \$ODBCHOME/lib:SHLIB_PATH \]

Validating the SAS/ACCESS Interface to ODBC

Before you can use the SAS/ACCESS Interface to ODBC, the following products are required:

- Base SAS software
- SAS/ACCESS Interface to ODBC
- ODBC Driver for your database
- DBMS client software may be required to connect to your database.

These drivers are often available from the DBMS vendor and other third party ODBC driver developers. The driver you choose may require additional DBMS software in order to access the data.
Release 8.2 of the SAS System on HP-UX supports both Cfront and ACC-compiled ODBC drivers. The driver type would have been selected when you installed the SAS System.

You may have to edit the .odbc.ini file in your home directory with a text editor to configure data sources. Some ODBC driver vendors may allow system administrators to maintain a centralized copy by setting the environment variable. Please refer to your ODBC driver’s vendor documentation to find more specific information.

The ODBC drivers are ODBC API-compliant shared libraries, referred to in UNIX as shared objects. You must include the full path to the shared libraries in the shared library path as shown below so that ODBC drivers can be loaded dynamically at run time. Also note that you may have to include your DBMS shared library path as described in the DBMS-specific section. You must also set the ODBCHOME environment variable to your ODBC home directory before setting the environment variables as shown in the example code below.

Note: SAS/ACCESS Interface to ODBC software has been tested using the MERANT DataDirect Connect ODBC driver and the DataDirect SequeLink ODBC driver.

For AIX

Set LIBPATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell:

```bash
LIBPATH=$ODBCHOME/lib:$LIBPATH
export LIBPATH
```

- For C Shell

```bash
setenv LIBPATH $ODBCHOME/lib:$LIBPATH
```

For Compaq Tru64 UNIX, Linux and Solaris

Set LD_LIBRARY_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell

```bash
LD_LIBRARY_PATH=$ODBCHOME/lib:$LD_LIBRARY_PATH
export LD_LIBRARY_PATH
```

- For C Shell

```bash
setenv LD_LIBRARY_PATH $ODBCHOME/lib:$LD_LIBRARY_PATH
```
For HP-UX

Set SHLIB_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell

  `SHLIB_PATH=$ODBCHOME/lib:$SHLIB_PATH`
  `export SHLIB_PATH`

- For C Shell

  `setenv SHLIB_PATH $ODBCHOME/lib:$SHLIB_PATH`

---

Validating the SAS/ACCESS Interface to ORACLE®

Refer to the *System Requirements* document provided in your installation package to find the exact releases supported by SAS/ACCESS software under the different operating systems.

The SAS/ACCESS Interface to ORACLE executable uses shared libraries. You must add the location of the ORACLE shared libraries to one of the system environment variables below, and if necessary indicate the ORACLE version that you have installed at your site.

*Note:* The validation process allocates the shared libraries for you based on the DBMS information you provide for your client install. The environment variables below must be set before you can use the SAS/ACCESS interface. You must also set the ORACLE_HOME environment variable to your ORACLE DBMS home directory before setting the environment variables as shown in the example code below.

For AIX

Set LIBPATH to point your DBMS shared library as shown in the following examples:

- For Bourne Shell

  `LIBPATH=$ORACLE_HOME/lib:$LIBPATH`
  `export LIBPATH`

- For C Shell

  `setenv LIBPATH $ORACLE_HOME/lib:$LIBPATH`
For ABI+ for Intel® Architecture, Compaq Tru64 UNIX, IRIX, and Linux

Set `LD_LIBRARY_PATH` to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell

  ```bash
  LD_LIBRARY_PATH=/usr/ucblib:$ORACLE_HOME/lib:$LD_LIBRARY_PATH
  export LD_LIBRARY_PATH
  ```

- For C Shell

  ```bash
  setenv LD_LIBRARY_PATH /usr/ucblib:$ORACLE_HOME/lib:$LD_LIBRARY_PATH
  ```

For HP-UX

Set `SHLIB_PATH` to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell

  ```bash
  SHLIB_PATH=$ORACLE_HOME/lib:$SHLIB_PATH
  export SHLIB_PATH
  ```

- For C Shell

  ```bash
  setenv SHLIB_PATH $ORACLE_HOME/lib:$SHLIB_PATH
  ```

For Solaris

Set `LD_LIBRARY_PATH` to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell

  ```bash
  LD_LIBRARY_PATH=$ORACLE_HOME/lib:/usr/ucblib:$LD_LIBRARY_PATH
  export LD_LIBRARY_PATH
  ```

- For C Shell

  ```bash
  setenv LD_LIBRARY_PATH=$ORACLE_HOME/lib:/usr/ucblib:$LD_LIBRARY_PATH
  ```
Post-Installation Steps / Validating the SAS/ACCESS Interface to PeopleSoft®

Refer to the System Requirements document provided in your installation package to find the exact releases supported by SAS/ACCESS software for UNIX environments, as well as the SAS/ACCESS products required for access to the underlying PeopleSoft database.

The SAS/ACCESS Interface to PeopleSoft requires that a libname statement be executed prior to running the application. This libname statement produces a libref to the database where the PeopleSoft data resides.

Here is an example of the libname statement:

```
libname psdb oracle user=userid pass=pass
  path='dbpath';
```

Validating the SAS/ACCESS Interface to SYBASE®

Refer to the System Requirements document provided in your installation package to find the exact releases supported by SAS/ACCESS software under the different operating systems.

The SAS/ACCESS Interface to SYBASE executable uses shared libraries. You must add the location of the SYBASE shared libraries to one of the system environment variables below, and if necessary indicate the SYBASE version that you have installed at your site.

**Note:** The validation process allocates the shared libraries for you based on the DBMS information you provide for your client install. The environment variables below must be set before you can use the SAS/ACCESS interface. You must also set the SYBASE environment variable to your SYBASE DBMS home directory before setting the environment variables shown in the example code below.

**For AIX**

Set LIBPATH to point to your DBMS shared library of your client install as shown in the following example:

- For Bourne Shell
  
  ```
  LIBPATH=$SYBASE/lib:/lib:$LIBPATH
  export LIBPATH
  ```

- For C Shell
  
  ```
  setenv LIBPATH $SYBASE/lib:/lib:$LIBPATH
  ```
For Compaq Tru64 UNIX, IRIX, Linux, and Solaris

Set LD_LIBRARY_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne shell

  ```bash
  LD_LIBRARY_PATH=$SYBASE/lib:/lib:$LD_LIBRARY_PATH
  export LD_LIBRARY_PATH
  ```

- For C shell

  ```bash
  setenv LD_LIBRARY_PATH $SYBASE/lib:/lib:$LD_LIBRARY_PATH
  ```

For HP-UX

Set SHLIB_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne shell

  ```bash
  SHLIB_PATH=$SYBASE/lib:/lib:$SHLIB_PATH
  export SHLIB_PATH
  ```

- For C shell

  ```bash
  setenv SHLIB_PATH $SYBASE/lib:/lib:$SHLIB_PATH
  ```

Validating the SAS/ACCESS Interface to Teradata Software

**Standard Installation**

The SAS/ACCESS Interface to Teradata Software uses Teradata-supplied CLIv2 shared libraries and message files. In particular, SAS/ACCESS uses `libcliv2.so`, `libtdusr.so`, and `errmsg.txt`, which typically reside in `usr/lib`.

If Teradata client software is not installed, then `libcliv2.so`, `libtdusr.so` and `errmsg.txt` will not exist on your system and SAS/ACCESS to Teradata will not function.
Non-standard Installation

If libcliv2.so, libtdusr.so and errmsg.txt do not reside in /usr/lib (the Teradata client software installation was non-standard), then the environment variables LD_LIBRARY_PATH and COPERR must be set.

If, for example, libcliv2.so and libtdusr.so reside in Teradata/lib, and errmsg.txt, resides in TERADATA2/txt, you would set LD_LIBRARY_PATH and COPERR as follows:

For AIX

Set LIBPATH to point to your DBMS shared library of your client install as shown in the following example:

- For Bourne shell

  LIBPATH=$TERADATA1/lib:/lib:$LIBPATH
  export LIBPATH

  COPERR=TERADATA2/txt
  export COPERR

- For C shell

  setenv LIBPATH $TERADATA1/lib:/lib:$LIBPATH
  setenv COPERR TERADATA/txt

For HP-UX

Set SHLIB_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne shell

  SHLIB_PATH=TERADATA1/lib:/lib:$SHLIB_PATH
  export SHLIB_PATH

  COPERR=TERADATA2/txt
  export COPERR

- For C shell

  setenv SHLIB_PATH TERADATA1/lib:/lib:$SHLIB_PATH
  setenv SHLIB_PATH TERADATA2
For ABI+ for Intel® Architecture

Note: NCR MP-RAS is the only Intel ABI operating system that applies for SAS/ACCESS Interface to Teradata.

Set LD_LIBRARY_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne Shell

  ```bash
  LD_LIBRARY_PATH=TERADATA1/lib:$LD_LIBRARY_PATH
  export LD_LIBRARY_PATH
  COPERR=TERADATA2/txt
  export COPERR
  ```

- For C Shell

  ```bash
  setenv LD_LIBRARY_PATH $TERADATA1/lib:$LD_LIBRARY_PATH
  setenv COPERR $TERADATA2/txt
  ```

For Solaris

Set LD_LIBRARY_PATH to point to your DBMS shared library as shown in the following examples:

- For Bourne shell

  ```bash
  LD_LIBRARY_PATH=$TERADATA1/lib:/lib:$LD_LIBRARY_PATH
  export LD_LIBRARY_PATH
  COPERR=TERADATA2/txt
  export COPERR
  ```

- For C shell

  ```bash
  setenv LD_LIBRARY_PATH TERADATA1/lib:/lib:$LD_LIBRARY_PATH
  setenv LD_LIBRARY_PATH TERADATA2/txt
  ```
Sample SAS/ACCESS Installation Output

$ ./sassetup

SAS System Installation Setup

Welcome to SAS Setup, a menu driven application used to install and maintain the SAS System. SAS Setup is fully documented in the installation instructions included in your installation package. Online copies of the enclosures can be found in the doc directory on the installation media, or in !SASROOT/doc once the system is installed.

Some conventions for SAS Setup are:
 * indicates the default selection
 [ ] indicates the default choice
 ( ) indicates an item is not selectable
 H, H#, #H displays help for an item or menu
 G goback to previous menu or prompt
 Q quits SAS Setup

Press <Return> to continue...

SAS Setup Primary Menu
 * 1. Load Software from Media
  2. Run Setup Utilities
  3. Quit SAS Setup
Action ? [1] 2

Run Setup Utilities
 * 1. Perform SAS System Configuration
  2. Perform Product Specific Configuration
  3. List Previously Installed Products
  1. Go Back
Action ? [1] 2

Product Specific Configuration
 * 1. SAS/ACCESS Configuration
  2. Desktop Configuration
  3. Specify SAS OnlineDoc Location
  4. Update SAS/IntrNet Services Configuration Program
  5. Specify SAS/GIS Census Tract Maps Location
  6. GoBack
Action ? [1] 1

SAS/ACCESS Verification Tests

Some SAS/ACCESS products require post-processing or validation programs to run prior to use. You will be asked to select which products to validate in the following selection screen. We recommend that you run the validation programs for all the SAS/ACCESS products you have installed.

<table>
<thead>
<tr>
<th>Num</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>SAS/ACCESS Interface to INGRES</td>
</tr>
<tr>
<td>2.</td>
<td>SAS/ACCESS Interface to DB2</td>
</tr>
<tr>
<td>3.</td>
<td>SAS/ACCESS Interface to INFORMIX</td>
</tr>
<tr>
<td>4.</td>
<td>SAS/ACCESS Interface to ORACLE</td>
</tr>
</tbody>
</table>
5. SAS/ACCESS Interface to SYBASE

SAS/ACCESS Interface to ORACLE Configuration

Enter the full path for the location of databases installed on your system. This is necessary for the SAS/ACCESS validation programs to find the databases to access.

Enter the ORACLE root/home directory?  
/usr/local/dbi/oracle/7.3.3.0.0

Enter the version of the database installed on your system. If the version of your database doesn't exactly match those listed, choose the highest number listed that is not greater than the version of your database.

Enter the version of your database:
* 1. 7.3.x
  2. 8.0.4.x
Action ? [1]

Running validation tests for SAS/ACCESS Interface to ORACLE...

The database SAS/ACCESS Interface to ORACLE successfully completed its validation test.
Appendix B, Post-Installation Setup for SAS/ACCESS® Interface to R/3® Software

SAS/ACCESS Interface to R/3 software requires extensive installation setup before the product can be used. You can view or download the detailed setup instructions from the SAS Web site:

http://www.sas.com/service/admin/unix/admindoc.html

Select the SAS/ACCESS link under the Products heading.

From this page, you can locate information regarding configurations, system & machine requirements, and upgrades.

For Linux

*Note:* Linux is not a supported platform for SAS/ACCESS Interface to R/3 software.
Appendix C, Post-Installation Setup for SAS/ACCESS®
Interface to SAP BW® Software

SAS/ACCESS Interface to SAP BW software requires extensive installation setup before the product can be used. You can view or download the detailed setup instructions from the SAS Web site:

http://www.sas.com/service/admin/unix/admindoc.html

Select the SAS/ACCESS link under the Products heading.

From this page, you can locate information regarding configurations, system & machine requirements, and upgrades.
Appendix D, Post-Installation Setup for SAS/ASSIST® Software

This appendix describes how to add an optional master profile to SAS/ASSIST software. You can use a master profile to override the default settings as sent by SAS Institute. This allows you to provide a customized setup for SAS/ASSIST software. With the master profile, you can control the profile options of all SAS/ASSIST users from one central place. For information on the profile options, refer to SAS/ASSIST Software Administrator’s Guide.

Adding a Master Profile

Complete the following steps to add a master profile to SAS/ASSIST software:

1. Specify the location of the master profile by creating a new directory that all users of SAS/ASSIST software will have read access to.

   All users with write access to this directory will automatically also have write access to the master profile in SAS/ASSIST software. Select a name that conforms to the naming conventions at your installation. The name of this new directory must be stored in an entry in the SASHELP library. This requires that you have write access to the SASHELP library.

   On line 1 of the Program Editor window of the SAS Display Manager System, type the physical pathname of the master profile directory. Execute the Save command to store this in the SASHELP.QASSIST catalog. Save it as sashelp.qassist parms.source. The location of the master profile is now known by SAS/ASSIST software.

2. Create the master profile.

   The first time SAS/ASSIST software is started, a master profile is created if SASHELP.QASSIST.PARMS.SOURCE contains the name of an existing physical pathname, and the person who starts SAS/ASSIST software has write access to this physical pathname.

3. Customize the master profile by starting SAS/ASSIST software and selecting

   Setup … Profiles … Master/group ...

   If you have write access to the SAS library containing the master profile, you can specify default values for your installation. New users will use these values as they start SAS/ASSIST software.

   Note: If you restrict values by typing R in Status, users will not be allowed to change the values you define.
You can run SAS/ASSIST software in two different styles - workplace or block menu. The block menu can be new style or old style. You can control this using the profile options below.

Run workplace:
SAS/Assist style: Workplace

Run block menu new style:
SAS/Assist style: Block Menu
Save selections on end: Yes
Menu Style: New

Run old style:
SAS/Assist style: Block Menu
Save selections on end: Yes
Menu Style: Old

By setting the default values in the master profile, you can control if users should use the new or old style of SAS/ASSIST software. In addition, there are many other profile options. For more information on these options, refer to SAS/ASSIST Software Administrator’s Guide.

4. Create group profiles.

From the master profile, it is possible to create group profiles to allow groups of users to have different setups. The master profile controls group profiles and user profiles when a user is not a member of any group. All users are indirectly controlled by the master profile when option values are set to a restricted (R) status.

From Setup...Master/Group, select Locals...Create Group Profile. To add users to a group profile, select Locals...Update User Group. By default, the userid is found in the macro variable &SYSJOBID. This value is set in the option Userid in the master profile (option type System Administration). Change the value if your site uses another variable to keep the userid. If the value name starts with &, it is a macro variable; otherwise, it is an environment variable, which is set before the start of the SAS System.
Appendix E, Post-Installation Setup for SAS/CONNECT® Software

This appendix describes the use of the sample script files shipped with SAS/CONNECT software, lists supported software for access methods available for UNIX environments, and outlines configuration procedures for those access methods that require additional configuration.

TCP/IP and APPC are the access methods supported for UNIX environments and their derivatives. Refer to Communications Access Methods for SAS/CONNECT and SAS/SHARE Software for information on the access methods supported by other systems.

User Authorization

You are required to complete the steps from the section “Configuring User Authorization” in Chapter 3, “Post-Installation Instructions.” This allows SAS/CONNECT, SAS/SHARE and SAS Integration Technologies software to authenticate a client’s identity and check a client’s authority to access resources.

Storing and Locating SAS/CONNECT Script Files

SAS/CONNECT software ships several sample script files that are used to establish a connection to a remote SAS session. The SASSCRIPT configuration option points to the location of the SAS/CONNECT script files. The SASSCRIPT option is used by SAS/ASSIST software and can be used by user-written SCL applications.

For UNIX environments, the script files are installed into the !SASROOT/misc/connect directory by default. The following line has been included in the sasv8.cfg file in order to define the default script file location:

-SASSCRIPT !SASROOT/misc/connect

If you want to move the script files to another directory, you must edit the sasv8.cfg file and update the SASSCRIPT option with the new directory location.

System Configuration for the TCP Access Method

The TCP/IP access method supplied with SAS/CONNECT software runs with the TCP/IP services that are native to the UNIX operating system. There are no additional requirements.
System Configuration for the APPC Communications Access Method

The following sections provide reference information for establishing an environment to use SNA LU6.2 APPC (Advanced Program-to-Program Communications) communications within your SAS applications under HP-UX and AIX.

*Note:* Currently, only a client-side implementation is available for use with either SAS/CONNECT or SAS/SHARE software.

System Configuration for the APPC Communications Access Method under HP-UX

**Software Requirements**

- Version 10.20 of the HP-UX operating system
- Release 3 or later of SNAplusAPI and SNAplusLink tested with Release 3/Dart 16 components. Recommended patches at Release 3/Dart 16: PHNE_4773, PHNE_5314, PHNE_5374

**SAS System Configuration**

**System Options**

- **COMAMID=APPC**
  
  specifies that the APPC access method should be used for communication between SAS/CONNECT local and remote sessions or SAS/SHARE user and server sessions. This option may be specified in the SAS command, in a SAS configuration file, or in an OPTIONS statement.

- **REMOTE=remote-session-id**
  
  specifies the logical unit (LU) to use in establishing a SAS/CONNECT remote session. To establish a remote session on another workstation, the value of this option in the local session on this workstation should be a partner lu_alias.

  When the remote session is on MVS, the value of this option should be the name of the APPC/MVS scheduler LU.

  When the remote session is on CMS, the value of this option should be the name of the AVS (APPC/VM VTAM Support) private gateway LU for the VM system.

  When the remote session is on VSE, the value of this option should be the name of the VTAM APPL ID (ABCNAME) that has been set up for APPC LU6.2 communications.

  When the remote session is on OS/2 or Windows, the value of this option should be the name of the control point LU configured on the remote workstation.
In all cases, the value of this option must be the same in the local and remote sessions. This option may be specified in the SAS command, in a SAS Configuration file, or in an OPTIONS statement.

Environment Variables

The following SAS environment variables may be specified globally in a SAS configuration file or on the SAS invocation command line with the following syntax:

-SET <variable> <value>

*Note:* The variable name must be specified in uppercase letters.

- **APPC\_LU**

  specifies the name of the local lu\_alias to use. This name must match an LU alias established during configuration. This variable is required unless a default local APPC LU has been defined. A macro-variable analog exists for runtime specifications.

- **APPC\_MODE**

  specifies the communication mode to use that represents the set of networking characteristics defined during configuration. The default name is SASAPPC. The mode name, whether you specify it with the APPC\_MODE variable or allow it to default to SASAPPC, must be defined in both the local and remote environments. A macro variable exists for runtime specification.

- **APPC\_SECURE**

  specifies a userid and password for the remote partner where a secured SAS/CONNECT remote session is to be established or a secured SAS/SHARE server is running. The value of this variable can be a “userid.password” string, _PROMPT_, or _NONE_. By specifying _PROMPT_, you will be prompted for a userid and password for the remote partner, which provides more security than specifying a readable “userid.password” string. The default is _NONE_, which causes no security userid or password to be presented to the remote partner. APPC/MVS, CMS, and VSE require security presentation while OS/2 and Windows do not unless security has been explicitly defined. A macro variable exists for runtime specification.

  *Note:* Security information can now be specified using the USERID and PASSWORD options on the SIGNON command or statement. This is the recommended method for specifying security information. Refer to the SAS/CONNECT Software User’s Guide in the online doc for details about these options. APPC\_SECURE is still supported as well.

- **APPC\_SURROGATE\_LUNAME**

  specifies which LU to use for a SAS/CONNECT remote session on MVS. If this variable is not defined, the MVS remote session dynamically selects an LU from the pool of LUs defined on MVS for this purpose.
- **APPC_PARTNER_COUNT**

  specifies the number of simultaneous partners that this local session will have at any one time. This estimate permits better allocation of memory resources for internal control block usage.

**Macro Variables**

The following SAS macro variables can be specified with the following SAS syntax:

```sas
%let <variable>=value;
```

- **APPCSEC**

  specifies a userid and password for the remote partner where a secured SAS/CONNECT remote session is to be established or a secured SAS/SHARE server is running. This macro variable may be used in lieu of the APPC_SECURE environment variable, and takes precedence.

- **APPCLU**

  specifies the name of the local lu_alias to use. This macro variable may be used in lieu of the APPC_LU environment variable, and takes precedence.

- **APPCMODE**

  specifies the communication mode to use that represents the set of networking characteristics defined during configuration. This macro variable may be used in lieu of the APPC_MODE environment variable, and takes precedence.

**HP-UX Configuration and Management**

**SNAplusLink**

The SNAplusLink product allows three types of connectivity: Synchronous Data Link Control (SDLC), Qualified Logical Link Control (QLLC), and Token Ring (TR). To use SNAplus over QLLC link, either X.25/9000 Link for the Series 700 or X.25/9000 Link for the Series 800 must have been installed and configured before you install and configure SNAplus. To use SNAplus over a TR link, either HP Token Ring/9000 for the Series 700 or HP Token Ring/9000 for the Series 800 must have been installed and configured before you install and configure SNAplus.

Before installing SNAplus with the installation script, you must first decide whether SNAplus software will function in a standalone or a client/server environment. In a standalone environment, all functionality is isolated to a single HP workstation. In a client/server environment, client HP workstations running SNAplus Presentation Services products (SNAplusAPI) can access server HP workstations running SNAplusLink where the physical link resides. Configuration related files that are created automatically by the installation script are: `sna.ini`, `com.cfg`, `com.sec`, and `sna.net` (client/server environment).
To configure SNAplusLink, use the `snapconfig` program. This program allows you to configure the link (SDLC, QLLC, TR), connection (logical path), and local node (PU 2.1).

**SNAplusAPI**

SNAplusAPI APPC can be configured with the `snapconfig` program. This program allows you to configure APPC modes, remote APPC LUs, and local APPC LUs.

**Management**

The SNAplus control daemon controls the SNAplusLink product (local nodes, links, and connections) and manages communication among SNAplus products and product components. The SNAplus control daemon must be started on each machine on the LAN (and on each standalone computer) before you can use any SNAplus products installed on that machine. To start the SNAplus control daemon issue the command `snapstart daemon` at the HP-UX command prompt.

The `snapmanage` program allows you to start and stop SNAplus products (SNAplusLink local nodes, links, and connections), view the status and monitor the use for SNAplus products, and control logging and tracing.

**Sample Configuration**

The following sample configuration snapshot was created using the `snaptextcfg` command. It is a subset of the information produced so as to limit the output to APPC specifics with Token Ring connection.

```plaintext
;******************************************************************
; SNAplus Binary to Text Configuration Utility
; Copyright (C) 1993 Hewlett-Packard Company
; Binary Configuration   = /usr/lib/sna/com.cfg
; Security File          = /usr/lib/sna/com.sec
; File version           = 100.20
;******************************************************************
```
;******************************************************************
; Diagnostics Record (Mandatory)
;******************************************************************
[DIAGNOSTICS]
connection = "" ; Name of network mgt connection
UCF_user = "" ; User ID for UCF commands
error_log = "/usr/lib/sna/sna.err" ; Error log file
audit_log = "/usr/lib/sna/sna.aud" ; Audit log file
audit_level = 6 ; Detailed problem analysis
send_overfl = No ; Send RTM when response counter max
send_end = No ; Send RTM at end of session
stop_timer = screen ; Data first reaches the screen
boundary_1 = 0.5 ; RTM histogram time boundaries
boundary_2 = 1.0
boundary_3 = 2.0
boundary_4 = 5.0
pc_error_log = "sna.err" ; PC client error log file
pc_audit_log = "sna.aud" ; PC client audit log file

;******************************************************************
; Local Node Record
;******************************************************************
[NODE]
name = "NODE1" ; Local Node Name
description = "Node for APPC" ; Description of Local Node
network = "SASNET01" ; Node Network Name

;******************************************************************
; APPC Local LU Record
;******************************************************************
[APPC_LOCAL_LU]
alias = "LOCLU001" ; LU Alias
node = "NODE1" ; Local Node
description = "Local LU/CP" ; Text description of LU
net_name = "SASNET01" ; LU Network Name
LU_name = "LOCLU001" ; Name of LU
LU_number = 0 ; LU Number
session_lim = 254 ; Session Limit
default_LU = Yes ; LU in pool of Default Lus
local_use = Yes ; LU can be used locally
syncpoint = No ; LU supports syncpoint sessions
conv_sec = No ; LU uses conversation level security
partner_LU = "PARTLU01" ; List of Partner LUs and Modes
partner_LU = "PARTLU02"
partner_LU = "PARTLU03"
partner_LU = "PARTLU04"
**Token Ring Connection Record**

```
;********************************************************************************
; Token Ring Connection Record
;********************************************************************************

[TR_CONN]
name = "TRCON" ; Name of connection
node = "NODE1" ; Name of node
description = "Token Ring connection" ; Description
remote_end = peer ; Remote end is peer
link_role = negotiable ; Station behaves as negotiable
activation = initially ; Initially active
node_send = "05D.FF815" ; Node id to send
node_rcv = "017.00000" ; Node id to receive
control_point = "SASNET01.LOCALCP" ; Fully qualified control point name
remote_address = 400031740001 ; Address of remote TR network
remote_sap = 04 ; Remote SAP address
retry_limit = 10 ; Retry limit
rcv_ack_limit = 10 ; Receive acknowledgment threshold
send_ack_limit = 10 ; Unacknowledged send threshold
max_btu = 4096 ; Maximum BTU length
link = "TOKEN" ; Link
;********************************************************************************

;APPC Mode Record
;Note: Be generous in defining session limits. Define enough sessions so
;that session limits will never be reached. As a APPC API limitation, if
;session limits are reached, the next time a conversation/session is
;requested, the APPC layer will not return to the application layer until
;a session is available. This indefinite waiting condition may cause you
;to think that SAS is not responding or that it is in a loop when in fact
;the underlying APPC layer is waiting for a session to become available.
;********************************************************************************

[APPC_MODE]
name = "SASAPPC" ; Mode name
mode_ID = 4 ; Unique Mode ID
description = "APPC Mode" ; Description
connection = "TRCON" ; Connection used by this mode
priority = high ; Mode is High Priority
session_limit = 12 ; Mode Session Limit
MCW = 12 ; Min Conwinner Sessions
partner_MCW = 0 ; Partner Min Conwinner Sessions
auto_act = 0 ; Auto activated sessions
min_sendRU = 256 ; Min Send RU size
max_sendRU = 4096 ; Max Send RU size
send_pace = 10 ; Send Pacing count
min_rcvRU = 256 ; Min Receive RU size
max_rcvRU = 4096 ; Max Receive RU size
rcv_pace = 10 ; Receive Pacing count
```
;*****************************************************************************
; APPC Remote LU Record
;*****************************************************************************
[APPC_REMOTE_LU]
alias        = "PARTLU01" ; LU Alias
description  = "MVS remote LU" ; Text description of LU
net_name     = "SASNET01" ; LU Network Name
LU_name      = "PARTLU01" ; Name of LU
SSCP_Alias   = "PARTLU01" ; SSCP LU Alias
parallel_sess= Yes ; Parallel Sessions supported
cnv_sec      = Yes ; LU uses conversation level security
preval_sec   = No ; LU can prevalidate security
session_sec  = none ; No Session Level Security

;*****************************************************************************
; APPC Remote LU Record
;*****************************************************************************
[APPC_REMOTE_LU]
alias        = "PARTLU02" ; LU Alias
description  = "MVS Surrogate LU" ; Text description of LU
net_name     = "SASNET01" ; LU Network Name
LU_name      = "PARTLU02" ; Name of LU
SSCP_Alias   = "PARTLU02" ; SSCP LU Alias
parallel_sess= Yes ; Parallel Sessions supported
cnv_sec      = Yes ; LU uses conversation level security
preval_sec   = No ; LU can prevalidate security
session_sec  = none ; No Session Level Security

;*****************************************************************************
; APPC Remote LU Record
;*****************************************************************************
[APPC_REMOTE_LU]
alias        = "PARTLU03" ; LU Alias
description  = "Windows remote LU" ; Text description of LU
net_name     = "SASNET01" ; LU Network Name
LU_name      = "PARTLU03" ; Name of LU
SSCP_Alias   = "PARTLU03" ; SSCP LU Alias
parallel_sess= Yes ; Parallel Sessions supported
cnv_sec      = Yes ; LU uses conversation level security
preval_sec   = No ; LU can prevalidate security
session_sec  = none ; No Session Level Security
An example SAS configuration file (sasv8.cfg) containing APPC specific environment variable options for client-side execution is listed below:

```
-set APPC_LU local-LU-alias
-set APPC_MODE mode-name
-set APPC_SECURE _PROMPT_
```

where local-LU-alias and mode-name is a defined and configured local LU and mode profile respectively.

The following is an example SAS/CONNECT signon:

```
options comamid=appc remote=partner-LU-alias;
signon;
```
where `partner-LU-alias` is a defined and configured remote partner LU.

The following is an example LIBNAME start to connect to a SAS/SHARE server:

```plaintext
options comamid=appc;
libname xxxx 'remote.data' server=partner-LU-alias;
```

where `partner-LU-alias` is a defined and configured remote partner LU.

**Note:** If the server is running on a CMS system that is connected to your system through a global VTAM gateway, you must use a two-level server name specification as follows:

```plaintext
server=gateway.serverid
```

where `gateway` is defined to the CMS system and is locally defined as a partner-LU-alias.

**References**

- HP-UX SNAplus Installation Guide (J2220-61021)
- HP-UX SNAplusLink Administrator’s Guide (J2220-61023)
- HP-UX SNAplusAPI Administrator’s Guide (J2223-61008)
- HP-UX SNAplus Diagnostics Guide (J2220-61022)
- Installing and Administering X.25/9000 (36940-90018)
- Installing and Administering Token Ring/9000 (J21625-61001)
- IBM SNA: Technical Overview
- IBM SNA: Formats

**System Configuration for the APPC Communications Access Method under AIX**

**Software Requirements**

- AIX version 4.2 or greater
- AIX SNA Server/6000 version 2.1.1
- IBM Communication Server for AIX, version 5.0 or greater

**SAS System Configuration**

**System Options**

- `COMAMID=APPC`

  specifies that the APPC access method should be used for communication between SAS/CONNECT local and remote sessions or SAS/SHARE user and server sessions. This option can be specified in the SAS command, in a SAS configuration file, or in an OPTIONS statement.
REMOTE=remote-session-id

specifies the logical unit (LU) to use in establishing a SAS/CONNECT remote session. To establish a remote session on another workstation, the value of this option in the local session on this workstation should be a partner LU name.

When the remote session is on MVS, the value of this option should be the name of the APPC/MVS scheduler LU.

When the remote session is on CMS, the value of this option should be the name of the AVS (APPC/VM VTAM Support) private gateway LU for the VM system.

When the remote session is on VSE, the value of this option should be the name of the VTAM APPL ID (ACBNAME) that has been set up for APPC LU6.2 communications.

When the remote session is on OS/2 or Windows, the value of this option should be the name of the control point LU configured on the remote workstation.

In all cases, the value of this option must be the same in the local and remote sessions. This option can be specified in the SAS command, in a SAS Configuration file, or in an OPTIONS statement.

Environment Variables

The following SAS environment variables can be specified globally in a SAS configuration file or on the SAS invocation command line with the following syntax:

-SET <variable> <value>

- APPC_NET

specifies the network name to utilize in order to form the fully qualified partner LU name in APPN environments. This name is required to exploit APPN connections in the absence of explicitly configured partner LU profiles. A macro-variable analog exists for runtime specification.

- APPC_MODE

specifies the communication mode to use that represents the set of networking characteristics defined during configuration. The default name is SASAPPC. The mode name, whether you specify it with the APPC_MODE variable or allow it to default to SASAPPC, must be defined in both the local and remote environments. A macro-variable analog exists for runtime specification.

- APPC_SECURE

specifies a userid and password for the remote partner where a secured SAS/CONNECT remote session is to be established or a secured SAS/SHARE server is running. The value of this variable can be a userid.password string, _PROMPT_, or _NONE_. By specifying _PROMPT_, you are prompted for a userid and password for the remote partner, which provides more security than specifying a readable “userid.password” string. The default is
which causes no security userid or password to be presented to the remote partner. APPC/MVS, CMS, and VSE require security presentation while OS/2 does not unless you have established a user profile on the OS/2 workstation with Communications Manager or with User Profile Management. A macro-variable analog exists for runtime specification.

**Note:** Security information can now be specified using the `USERID` and `PASSWORD` options on the `SIGNON` command or statement. This is the recommended method for specifying security information. Refer to the *SAS/CONNECT Software User’s Guide* in the online doc for details about these options. `APPC_SECURE` is still supported as well.

- **APPC_SURROGATE_LUNAME**

  specifies which LU to use for a SAS/CONNECT remote session on MVS. If this variable is not defined, the MVS remote session dynamically selects an LU from the pool of LUs defined on MVS for this purpose.

**Macro Variables**

The following SAS macro variables can be specified with the following SAS syntax:

```sas
%let <variable>=value;
```

- **APPCNET**

  specifies the network name to utilize in order to form the fully qualified partner LU name in APPN environments. This macro variable can be used in lieu of the `APPC_NET` environment variable, and takes precedence.

- **APPCMODE**

  specifies the communication mode to use that represents the set of networking characteristics defined during configuration. This macro variable can be used in lieu of the `APPC_MODE` environment variable, and takes precedence.

- **APPCSEC**

  specifies a userid and password for the remote partner where a secured SAS/CONNECT remote session is to be established or a secured SAS/SHARE server is running. This macro variable can be used in lieu of the `APPC_SECURE` environment variable, and takes precedence.

**SNA Server/6000 Configuration**

Various configuration tasks must be completed before APPC connectivity within SAS can be utilized. If SNA APPC is utilized by other applications at your site, it may be that the necessary tasks have already been performed. If not, the degree of configuration required is dependent on the capabilities of your SNA network. More specifically, if your SNA network supports APPN, no partner logical unit, location, and side information profiles need be configured.
At a minimum, node, control point, data link control, link station, and mode profiles are required. The node profile is created when the SNA Server/6000 product is installed, and defines a set of modifiable default parameters that establish operational controls. A control point definition is required to define local SNA aspects regarding PU/LU functionality, including APPN characteristics. Data link control and link station profiles define transport layer attributes including network interface type as well as local control and remote link station characteristics. Mode profiles are required for each mode name in the set of possible presentations between all potential remote partners. That is, any mode name to be utilized in a session establishment request must be defined to both the local and remote LUs. The profile definitions are utilized during session setup to establish flow control parameters such as request unit sizes and pacing limits as well as to control maximum session limits. If your SNA network does not support APPN, partner logical unit, location, and side information profiles must be configured for each potential partner.

The following are sample configuration files:

```
sna:
  prof_name = "sna"
  max_sessions = 200
  max_conversations = 200
  restart_action = once
  rrm_enabled = no
  dynamic_inbound_partner盧_definitions_allowed = yes
  standard_output_device = "/dev/console"
  standard_error_device = "/var/sna/sna.stderr"
  nmvt_action_when_no_nmvt_process = reject
  trusted_group_ids = {system}
  comments = 

control_pt:
  prof_name = "node_cp"
  xid_node_id = "*"
  network_name = "SASNET01"
  control_pt_name_alias = "P0CP1001"
  control_pt_name = "P0CP1001"
  control_pt_node_type = appn_end_node
  max_cached_trees = 500
  max_nodes_in_topology_database = 500
  route_addition_resistance = 128
  comments = 

partner_lu6.2:
  prof_name = "P0LU2001"
  fq_partner_lu_name = "SASNET01.P0LU2001"
  partner_lu_alias = "P0LU2001"
  session_security_supp = no
  parallel_session_supp = yes
  conversation_security_level = none
```
comments = ""

partner

partner_lu6.2_location:

prof_name = "P0LU2001"
fq_partner

partner_location_method = owning_cp

local_node_is_network_server_for_len_node = no

local_lu_name = ""

link_station_profile_name = ""

comments = ""

side_info:

prof_name = "P0LU2001"

local_lu_or_control_pt_alias = "P0CP1001"

partner_lu_alias = ""

fq_partner

mode_name = "MODE001"

remote_tp_name_in_hex = no

remote_tp_name = ""

comments = ""

link_station_token_ring:

prof_name = "TR3174"

use_control_pt_xid = yes

xid_node_id = ""

sna_dlc_profile_name = "TR3174"

stop_on_inactivity = no

time_out_value = 0

LU_registration_supported = no

LU_registration_profile_name = ""

link_tracing = no

trace_format = long

access_routing_type = link_address

remote_link_name = ""

remote_link_address = 0x400000000001

remote_sap = 0x04

call_out_on_activation = yes

verify_adjacent_node = no

net_id_of_adjacent_node = "SASNET01"

cp_name_of_adjacent_node = "P00U1000"

xid_node_id_of_adjacent_node = ""

node_type_of_adjacent_node = learn

solicit_sscp_sessions = yes

activate_link_during_system_init = yes

activate_link_on_demand = no
cp_cp_sessions_supported = yes
cp_cp_session_support_required = no
adjacent_node_is_preferred_server = yes
initial_tg_number = 0
restart_on_normal_deactivation = no
restart_on_abnormal_deactivation = no
restart_on_activation = no
TG_effective_capacity = 4300800
TG_connect_cost_per_time = 0
TG_cost_per_byte = 0
TG_security = nonsecure
TG_propagation_delay = lan
TG_user_defined_1 = 128
TG_user_defined_2 = 128
TG_user_defined_3 = 128
comments = ""
sna_dlc_token_ring:
  prof_name = "TR3174"
datalink_device_name = "tok0"
force_timeout = 120
user_defined_max_i_field = no
max_i_field_length = 30729
max_active_link_stations = 100
num_reserved_inbound_activation = 0
num_reserved_outbound_activation = 0
transmit_window_count = 8
dynamic_window_increment = 1
retransmit_count = 8
receive_window_count = 8
priority = 0
inact_timeout = 48
response_timeout = 4
acknowledgement_timeout = 1
link_name = ""
local_sap = 0x04
retry_interval = 60
retry_limit = 20
dynamic_link_station_supported = no
trace_base_listen_link_station = no
dynamic_base_listen_link_station_format = long
dynamic_lnk_solicit_sscp_sessions = yes
dynamic_lnk_cp_cp_sessions_supported = yes
dynamic_lnk_cp_cp_session_support_required = no
dynamic_lnk_TG_effective_capacity = 4300800
dynamic_lnk_TG_connect_cost_per_time = 0
dynamic_lnk_TG_cost_per_byte = 0
dynamic_lnk_TG_security = nonsecure
dynamic_lnk_TG_propagation_delay = lan
dynamic_lnk_TG_user_defined_1 = 128
dynamic_lnk_TG_user_defined_2 = 128
dynamic_lnk_TG_user_defined_3 = 128
comments = 

mode:
  prof_name = "MODE001"
  mode_name = "MODE001"
  max_sessions = 5000
  min_conwinner_sessions = 5000
  min_conloser_sessions = 0
  auto_activate_limit = 0
  max_adaptive_receive_pacing_window = 16
  receive_pacing_window = 7
  max_ru_size = 1024
  min_ru_size = 256
  class_of_service_name = "#CONNECT"
  comments = ""

SAS Specifics

The following is an example SAS configuration file (sasv8.cfg) containing APPC specific environment variable options for client-side execution:

- set APPC_MODE mode-name
- set APPC_SECURE _PROMPT_

where mode-name is a defined and configured LU 6.2 mode profile.

The following is an example SAS/CONNECT signon:

options comamid=appc remote=partner-LU;
signon;

where partner-LU is a defined and configured partner LU or network name augmented in order to form an APPN fully qualified partner LU name.

The following is an example LIBNAME statement to connect to a SAS/SHARE server:

options comamid=appc;
libname xxxx 'remote.data' server=partner-LU;

where partner-LU is a defined and configured partner LU profile or is network name augmented (through the APPC_NET environment variable or APPCNET macro variable) in order to form an APPN fully-qualified partner LU name.

Note: If the server is running on a CMS system that is connected to your system through a global VTAM gateway, you must use a two-level server name specification as follows:

server=gateway.serverid
where `gateway` is defined to the CMS system and is locally defined as a `partner_lu_alias`.

References

- AIX SNA Server/6000 Command Reference (SC31-7100)
- AIX SNA Server/6000 Diagnosis Guide and Messages (SC31-7101)
- AIX SNA Server/6000 User’s Guide (SC31-7002)
- AIX SNA Server/6000 Transaction Program Reference (SC31-7003)
- AIX SNA Server/6000 Configuration Reference (SC31-7014)
Appendix F, SAS/Direct™ for EMC Symmetrix®

Configuring SAS/Direct for EMC Symmetrix

If you licensed SAS/Direct for EMC Symmetrix software and have completed the installation instructions for SAS described earlier in this document, you have installed the UNIX platform components of SAS/Direct for EMC Symmetrix. The instructions in this section will explain how to tailor SAS/Direct for EMC Symmetrix for your use.

To begin configuring SAS/Direct for EMC Symmetrix, confirm that the storage configuration is complete, with the prerequisite EMC software installed.

After storage configuration is completed, you will need to review the infrastructure links to ensure that access permission and pathways are in place.

For AIX

If you install SAS/DIRECT for EMC Symmetrix software on AIX, you will need to download and install the required hot fix 82ba62 from the SAS Technical Support Web site. Please note that this is for installation of SAS/DIRECT for EMC Symmetrix software on AIX only. Other operating systems do not require this hot fix.

Configure the Storage Environment

Refer to EMC documentation or contact your local EMC representative for details about configuring the EMC environment. The EMC InfoMover File System Administrator’s Guide provides information about configuring shared access on the Symmetrix storage array.

Additional EMC software can be installed before or after the SAS/Direct for EMC Symmetrix software is installed.


2. Confirm that you have a supported MVS environment:
   - OS/390 Version 1.1 or higher
   - MVS/SP Version 4.3 (MVS/ESA) or higher
3. Confirm that the MVS system and the target UNIX system are connected to the same EMC Symmetrix storage system. Customers will need to ensure that the appropriate ESP license from EMC is in place to allow multiple servers to share the Symmetrix.

- The UNIX system(s) can be connected to the Symmetrix disk array with either SCSI or Fibre Channel links.
- The mainframe must be connected to the Symmetrix disk array via ESCON™.

4. Confirm that EMC Symmetrix is updated with appropriate software and firmware levels.

5. Confirm that EMC’s InfoMover File System software is installed.

   **Note:** InfoMover File System 2.1 may encounter an error when reading mainframe files larger than 4GB. To avoid this problem, install the Large File Patch available in the InfoMover 3.2 package:

   a. Load the CD onto the system.
   b. Change to the .updates directory, using the -a option on UNIX to see the directory.
   c. Follow the instructions in the README file.

   If you are using an earlier version of InfoMover File System, please refer to the EMC InfoMover File System Administrator’s Guide or contact your EMC Customer Support representation for more information.

6. Local storage for the MVS system must be available on the Symmetrix storage array. Confirm that the dataset for which you want to have shared access is stored in CKD (count key data) file system format on the Symmetrix storage array.

7. Local storage for the UNIX system can be configured on the Symmetrix storage array. It is not required that the UNIX system use the Symmetrix storage array for its local storage.

### Configure Infrastructure Links

1. Confirm that a TCP/IP connection exists between the UNIX and MVS system. IBM TCP/IP for MVS Version 3.1 or higher is required.

2. Create appropriate permissions for the UNIX user to access the MVS file. (For more details, please refer to the section, “Authentication between MVS and UNIX Systems” in Chapter 2, “Logging In and Out” in the EMC InfoMover File System User’s Guide.)

3. Confirm that the SAS datasets on the MVS system were created with SAS release 8.2 or higher if you plan to access them via SAS/Direct for EMC Symmetrix.
Usage Syntax

A SAS data library is a collection of SAS files that are recognized as a unit by the SAS System. SAS data libraries have different representations on each host operating system. SAS/Direct for EMC Symmetrix enables UNIX users to share a bound data set with the MVS environment.

Regardless of which host operating system that is used, SAS requires that data libraries be assigned to a libref.

A libref (library reference) is a temporary, shorthand way of referring to a SAS data library in a SAS program statement. Each time a SAS session is invoked; a libref must be assigned to the host operating system name for each SAS data library that will be accessed.

The generic syntax takes this form:

```
LIBNAME libref 'SAS-data-library' <options> mvsdatalib = directifs;
```

A UNIX-specific example would look like this:

```
libname compdat '/users/company/datalib' mvsdatalib = directifs;
```

Read-only access from UNIX system

SAS/Direct for EMC Symmetrix only supports read access for SAS MVS bound libraries that have been generated with V8 SAS or higher. The entire MVS bound library is locked when accessing any data set within the MVS bound library.

As an alternative to accessing an EMC Symmetrix, MVS bound libraries containing SAS datasets can also be ftp’ed to the UNIX platform. They can be read via SAS/Direct for EMC Symmetrix without the need to convert the files to UNIX format. In general, moving large datasets off of an EMC Symmetrix around the network is not the main intent of this product.

SAS/Direct for EMC Symmetrix uses Cross Environment Data Access (CEDA), which is installed as part of base SAS. CEDA no longer requires a separate SAS/Connect license for the SAS System Release 8.2.

Support for SAS/Direct for EMC Symmetrix

SAS/Direct for EMC Symmetrix uses technology from both SAS and EMC. If you have questions or encounter problems, collecting the information below will help the appropriate support team when they assist you:

- SAS revision – refer to the file date of the sas binary.
- SAS/Direct for EMC Symmetrix revision – refer to the file date for sas2emc binary.
- Configuration information:
  - Operating system and revision
  - EMC storage array model number & microcode revision levels
- EMC IFS revision and patch level
EMC Issues


Confirm that you can access mainframe data using the command line semantics described in the EMC documentation. If there are problems with this access, please call your EMC support representative to ensure that the connections and access for the EMC Symmetrix are properly installed.

SAS Issues

If you have confirmed that you can access mainframe data using command line semantics, and you are unable to access the specified data using the SAS/Direct for EMC semantics within your SAS program, please try to access the data in an interactive session. Then, write down (or otherwise capture through error logs) any error or informational messages that are returned.

- If you install SAS/DIRECT for EMC Symmetrix software on AIX, you will need to download and install the required hot fix 82ba62 from the SAS Technical Support Web site. Please note that this is for installation of SAS/DIRECT for EMC Symmetrix software on AIX only.

Important: Other operating systems do not require and should not apply this hot fix for SAS/DIRECT for EMC Symmetrix software.
Appendix G, Post-Installation Setup of Enterprise Miner™ Server Software

Enterprise Miner uses a client/server architecture that provides the following features:

- distributes data-intensive processing to the most appropriate machine
- minimizes network traffic by processing data on the server machine
- minimizes data redundancy by maintaining one central data source
- distributes server profiles to multiple clients
- regulates access to data sources
- toggles between remote and local processing

Enterprise Miner Server runs under UNIX on ABI+ for Intel Architecture, AIX, Compaq Tru64 UNIX, HP-UX, Linux, and Solaris operating systems, as well as on Microsoft Windows NT Server, and OS/390 operating systems.

Enterprise Miner Client runs on Microsoft Windows platforms supported by Release 8.2 of the SAS System.

Configuring Enterprise Miner Server Software

Setup Default Data Library

Create a data library on the server to which Enterprise Miner Client Software users have read/write access. This library should be a different directory from the SASROOT location, and ideally, on a different disk altogether. To create the data library, make or designate a directory on an available disk, and set appropriate permissions and ownership to allow remote users read and write access.

Provide Information to Configure Enterprise Miner Client Software

Provide the following information to users of Enterprise Miner Client Software to complete the configuration steps necessary for Enterprise Miner Client Software:

- the machine name and/or IP address of the server
- the SASROOT location for the SAS System installed on the server machine
- the directory path of the default data library you created on the server

Note: Do not use an NFS mount point.

Enterprise Miner Server Software is invoked from the Enterprise Miner Client via SAS/CONNECT. For more information on running Enterprise Miner, refer to Getting Started with the Enterprise Miner Software, Release 4.1, and Enterprise Miner Software: Changes and Enhancements, Release 4.1.
Appendix H, SAS/GIS® Census Tract Maps Installation and Configuration

If you have licensed the SAS/GIS product you will automatically receive a separate CD containing SAS/GIS Census Tract Maps. The SAS/GIS Census Tract Maps CD can either be installed to a disk location on your system or mounted and accessed directly from the SAS System.

These map data sets are based on extractions from the U.S. Census Bureau TIGERLine files. Installation of these data sets enables the Build Census Tract Maps utility in the SAS/GIS product to create Census Tract maps to the SAS System user’s specifications.

Mounting and Installing the SAS/GIS Census Tract Maps

Follow the steps outlined in Chapter 2 of this document in “Launching SAS Setup” that refer to mounting the SAS System CD for your particular operating system. These same steps apply to the SAS/GIS Census Tract Maps CD. If you want to access the CD directly from the SAS System, please refer to the section “Configuring the SAS/GIS Census Tract Maps” below.

If you want to install the SAS/GIS Census Tract Maps, continue following the steps outlined in Chapter 2 and launch SAS Setup from the SAS/GIS Census Tract Maps CD.

Note: The SAS System must be installed before you attempt to install the SAS/GIS Census Tract Maps.

Configuring the SAS/GIS Census Tract Maps

SAS Setup will automatically configure the SAS/GIS Census Tract Maps if you install them to disk. However, if you want to change the location of your installed SAS/GIS Census Tract Maps or you have mounted the CD for direct access, you must update your config file for the SAS System to set the -gismaps configuration option to reference the location of the map data sets.

Complete the following steps to configure the SAS/GIS Census Tract Maps:

1. Log in with appropriate privileges to write to files in SASROOT.

2. Run SAS Setup located in SASROOT.

   !SASROOT/sassetup

3. Select Run Setup Utilities from the primary menu.

4. Select Perform Product Specific Configuration from the utilities menu.
5. Select Specify SAS/GIS Census Tract Maps Location to update your config file with the location of the SAS/GIS Census Tract Maps.

6. Enter Q to quit sasetup.
Appendix I, Post-Installation Setup for SAS/GRAPH® Software

Using SAS/GRAPH Software, you can produce interactive charts and plots for Web publishing. The GCHART, GCONTOUR, GMAP, GPLOT, and G3D procedures can produce scripted ActiveX Controls or Java Applets in HTML pages using the SAS/GRAPH Java or ActiveX drivers and the Output Delivery System (ODS). The DS2GRAF, DS2CSF, and META2HTM macros can also be used to generate HTML output with embedded ActiveX Controls or Java Applets.

The following controls and applets are available:

**ContourApplet (ctrapp.jar)**

A scriptable Java applet for visualization of Contour and Surface plots in a Web browser. The applet supports outline and filled modes and interactive exploration of the data. ContourApplet is supported by the SAS/GRAPH Java driver with ODS.

**GraphApplet (graphapp.jar)**

A scriptable Java applet for visualization of 2D and 3D charts in a Web browser. The applet supports bar charts, pie charts and scatter plots, and interactive exploration of the data. GraphApplet is supported by the SAS/GRAPH Java driver with ODS, and also by the DS2GRAF macro.

**MapApplet (mapapp.jar and related map data jar files)**

The Java Map Applet is a scriptable Java graphics control that allows the user to embed interactive spatial data in a Java 1.1 compliant Web page. The Web page is created with PROC GMAP and uses the map jar files that correspond to the SAS Map Data Sets. MapApplet is supported by the SAS/GRAPH Java driver with ODS.

**MetaViewApplet (metafile.zip)**

A Java applet for displaying SAS/GRAPH metagraphics data. MetaViewApplet is supported by the SAS/GRAPH metagraphics driver and the META2HTM macro.

**RangeViewApplet (rvapplet.jar)**

A Java applet for displaying a Critical Success Factor (CSF). A CSF is a graphic that visually represents the position of some value in a range of data. RangeViewApplet is supported by the DS2CSF macro.
SAS/GRAPH Control for ActiveX

This ActiveX control enables you to embed interactive graphs in Web pages and OLE documents (in Microsoft Office products), as well as in applications written in Visual Basic, C++, HTML, and JavaScript. When the graph is displayed, you can point-and-click to rotate, change, or further investigate the graph.

The SAS/GRAPH Control for ActiveX supports the following graph types:

- area plots
- bubble plots
- line plots
- regression plots
- surface plots
- bar charts
- contour plots
- maps
- scatter plots
- box-and-whisker plots
- high-low plots
- pie charts
- standard deviation plots

SAS/GRAPH Control for ActiveX is supported by the SAS/GRAPH ActiveX driver with ODS, and also by the DS2GRAF macro.

Client Components


All the Java applet clients except the RangeView Applet are installed with SAS/GRAPH Software. The applets are located in !APPLETLOC (normally !SASROOT/misc/applets.) To determine the location of !APPLETLOC, run PROC OPTIONS or view the SAS configuration file to find the value of APPLETLOC.

If you wish to publish SAS/GRAPH output on a Web server or create SAS/IntrNet applications using SAS/GRAPH, you may need to install these SAS/GRAPH clients on your Web server. The clients can be copied from APPLETLOC (applets only) or the SAS Client-Side Components CD included with your SAS Software distribution. See the installation instructions on the SAS Client-Side Components CD for more information on installing SAS/GRAPH clients on a Web server.
Appendix J, Installing SAS Integration Technologies

Client Components

SAS Integration Technologies includes client components that are used outside of your SAS installation. These components must be installed in the client environment before they can be used. The following component packages are available:

Integration Technologies Documentation

The documentation package provides complete documentation for SAS Integration Technologies. You can install the documentation on a Web server for common access, or you can install it for each developer and end-user. The Integration Technologies documentation will be updated and provided on the SAS Web site.

Java Client Development and Runtime Component

Install this package for each developer who will be creating applications that run in a Java environment and communicate with a SAS session.

Windows Client Development and Runtime Component

Install this package for each developer who will be creating applications that run in a Windows environment and communicate with a SAS session. You must also install this package on each client machine that will access the COM interfaces that are provided by the SAS server.

Integration Technologies Administrator

Install this Java application where you plan to manage your object servers and spawners and your publishing framework. To use this application, you must also have an LDAP server installed.

SAS Package Reader

Install this application for every user who will access an SPK file that was created using the publishing framework.

Subscription Manager

Install this applet on a Web server for all users to access. Note that subscriptions can also be managed using the Administrator application.
Client Component Delivery

SAS Integration Technologies client components are delivered with SAS Integration Technologies Software, and can be installed from the SAS Client-Side Components CD included with your SAS Software distribution. For updated components and documentation, please visit the following Web site:

Appendix K, Installing SAS/IntrNet® Software

Introduction

If you licensed SAS/IntrNet software and have completed the installation instructions described earlier in this document, you have installed the SAS server components of SAS/IntrNet software (referred to as the SAS/IntrNet server). The Client-Side Components CD that is included with your SAS software package also contains the complete documentation for SAS/IntrNet software.

Installing SAS/IntrNet Web Server or Client Components

SAS/IntrNet software also includes components that must be installed on a Web server or on individual client machines. To install any of the additional SAS/IntrNet components:

1. Locate the Client-Side Components CD that is included in your SAS software package, and mount the CD according to the platform-specific instructions that are provided on the inside cover.

2. In a browser, view the index.html page that is located in the root directory of your CD.

3. From the index page, select the SAS/IntrNet Software link to go to the SAS/IntrNet home page.

4. From the SAS/IntrNet home page, select the Install icon and follow the instructions that are provided on the “Installing SAS/IntrNet Software for Version 8” page.

User Authorization

You are required to complete the steps from the section “Configuring User Authorization” on page 20 in Chapter 3, “Post-Installation Instructions.” This allows SAS/CONNECT, SAS/SHARE and SAS Integration Technologies software to authenticate a client’s identity and check a client’s authority to access resources.

Configuring SAS/IntrNet Components

Both the SAS/IntrNet server and the Web server components require additional configuration before you can use them in your Web-enabled environment. Configuration information is provided as part of the SAS/IntrNet documentation that is on the Client-Side Components CD and is also available as a downloadable package that you can install for easier access.
Updates to Components and Documentation

Additional documentation and component updates may be available from our Web site at http://www.sas.com/rnd/web/. You may want to monitor the What’s New page (new.html) for information about new or updated components.
Appendix L, Installing SAS® IT Resource Management 2.6

SAS IT Resource Management Functionality

SAS IT Resource Management is a data management and presentation software package for evaluating the delivery of services to your IT users. With SAS IT Resource Management, you can report on the utilization and service levels from such diverse parts of your IT operation as file servers, mainframes, telephone PBX’s, Help Desks, or network links using one tool.

SAS IT Resource Management has both client and server components. The server software is required to process, reduce, and/or update the data in a performance data warehouse (PDB) located on your system. The client software is required only if you want to access a performance data warehouse on a remote server system from a client PC platform.

SAS IT Resource Management Server runs on Microsoft Windows NT Server, OS/390, and selected UNIX operating systems.

SAS IT Resource Management Client runs on Microsoft Windows platforms supported by Release 8.2 of the SAS System.


Note: SAS IT Resource Management was formerly known as IT Service Vision. Some documentation and references may still use the former name.

Installing SAS IT Resource Management

Migration Considerations

If you have modified your SITELIB library, you will need to save a copy of it so that you can merge it into the new SITELIB library. Please see the instructions relating to “Site Library Considerations” on page 84.

If you have an existing SAS IT Resource Management installation and want to migrate from SAS Version 6 to SAS Version 8, refer to the conversion information in the directory !SASROOT/saspgm/cpe/itsvdocs/convert.htm and at www.sas.com/itsvconv.
Installation Customizations

SAS IT Resource Management Solution will be installed in the !SASROOT folder. If you wish to see any additional SAS System components present on your media, select Load Selected Software from Media.

Configuring the SAS System for SAS IT Resource Management

Verify that X resource SAS.dmsContrastCheck is set to True to assure that SAS IT Resource Management message windows have the appropriate contrast between text and background, regardless of your personal settings for background and foreground colors.

Starting SAS IT Resource Management

To start SAS IT Resource Management from the UNIX command line, issue the command sasisrv, which is located in the !SASROOT directory. If SAS was installed in /usr/local/sasv8, then the command to issue would be /usr/local/sasv8/sasisrv.

To start SAS IT Resource Management from within the SAS System, issue the itsv command. You can enter the itsv command in the SAS toolbar command area or after the Command==> prompt, which is obtained by clicking on Globals ===> Options ===> Command Line. You can also start SAS IT Resource Management from within SAS by submitting this statement via the Program Editor:

$CPSTART();

To start the DeskTop Reporter from the UNIX command line, start SAS by referencing the !SASROOT/saspgm/cpe/dtr/dtrstart.sas file in the -autoexec parm using a command similar to the following:

sas -autoexec /usr/local/sasv8/saspgm/cpe/dtr/dtrstart.sas

SAS IT Resource Management Documentation


For more information on running and configuring SAS IT Resource Management, please see Getting Started with IT Service Vision, Release 2.

Online documentation is also available from within SAS and SAS IT Resource Management. From SAS, select Help => SAS System Help => Help on SAS software Products => IT Service Vision.

From the SAS IT Resource Management user interface, select OnlineHelp => SAS IT Resource Management Help.
Select OnlineHelp => Other ITRM Documentation for the following documents:

- Collector Updates
- Link to SAS IT Resource Management on the Web
- Server Setup Guide - Printable versions of the Setup guide are also available in !SASROOT/saspgm/cpe/itsvdocs/sa/pdfs
- QuickStart Examples - Also directly available with a Web browser from !SASROOT/saspgm/cpe/itsvdocs/qs/welcome.htm
- Showroom - Also directly available with a Web browser from !SASROOT/saspgm/cpe/itsvdocs/showroom/welcome.htm
- Migration - Also directly available with a Web browser from !SASROOT/saspgm/cpe/itsvdocs/convert.htm and at www.sas.com/itsvconv

Site Library Considerations

First Time Installations

If you are installing SAS IT Resource Management for the first time you may want, at some future date, to create a separate SITELIB directory to store site-wide options or customizations, such as your site’s preferred graphics device. The supplied version of this directory containing default values will have been created in !SASROOT/saspgm/cpe/sitelib during the default production installation of SAS IT Resource Management.

Wherever you choose to locate SITELIB, you must have write access to it, and all other SAS IT Resource Management software users must have read access. If you choose to re-locate SITELIB, follow the instructions in the section “Modifying the default pointer to SITELIB library” below.

Upgrading Existing Installations

If this is not your first installation of SAS IT Resource Management, it is strongly recommended that you consider the location of your existing production SITELIB before you install. Without planning, you risk overlaying and losing existing PDB and site options.

When you installed SAS IT Resource Management previously, a directory containing default values was created in !SASROOT/saspgm/cpe/sitelib. Since then, you may have created another SITELIB library and re-programmed SAS IT Resource Management to use this new location as its default SITELIB. If you are not sure if this happened, you can find out by starting SAS and your existing SAS IT Resource Management interactively, and then issuing the LIBNAME command from the command line in the toolbar. Note the location of the SITELIB library.

In either case, you should close your LIBNAME window, the SAS IT Resource Management application, and the SAS session and make a backup of that whole directory now. This will ensure that you have a method of restoring the directory’s contents if a problem occurs after the update.
If this is not your first installation of SAS IT Resource Management, you now need to consider the maintenance of the SITELIB library. In the MISC directory just installed, locate a member called CPSITEUP. This code will merge your old, production SITELIB library with your newly installed version. Please read the following sections for details on site libraries and how to run the code.

**Maintaining SITELIB with Previous SAS IT Resource Management Installations**

*Note:* The following section is relevant when this is not a first installation of SAS IT Resource Management.

When a new version or release of SAS IT Resource Management is installed, a new SITELIB library is created. This ensures that you are able to access any SITELIB updates that may have been made in the product.

However, since you have the opportunity to update the menu and other SITELIB datasets, you will probably want to save your modifications and avoid re-engineering them in the new library from scratch. To preserve your modifications, we have supplied code that will merge your existing production SITELIB datasets and catalogs in with the new versions. This code is contained in the !SASROOT/misc/cpe directory.

If you have an existing production SITELIB library that contains site-wide options or datasets that you want to make available to the new release of SAS IT Resource Management, locate the CPSITEUP member and review its contents.

The CPSITEUP code refers to three SITELIB libraries:

1. The newly installed SITELIB, referred to as NEWSITE,
2. The current, production/default SITELIB (whether it is the previously installed SITELIB or a subsequently re-located version), referred to as OLDSITE, and
3. PRODSITE, which is used in referring to your chosen location for the production SITELIB for the newly installed release of SAS IT Resource Management.

So, before running CPSITEUP, ensure that the following updates have been made:

- NEWSITE points to your newly installed SITELIB.
- OLDSITE points to your current production/default SITELIB.
- PRODSITE points to a directory or library from which you want to run SAS IT Resource Management. This could be the same location as OLDSITE or NEWSITE, in which case those libraries will be overwritten, or it could be somewhere new.

Run the CPSITEUP code, following the instructions at the top of the code.
If you have decided to use a SITELIB library whose location is not that of the newly installed SITELIB, CPSITEUP will also update the pointer held in PGMLIB so that your chosen SITELIB becomes the new default SITELIB. You will not need to perform the task described in the following section, “Modifying the default pointer to SITELIB library.”

Other tools that are available for modifying site-wide options are the macros %CPPDBOPT and %CPHDAY, both of which are documented in the SAS IT Resource Management Macro Reference.

Modifying the Default Pointer to SITELIB Library

A SITELIB directory and its files must be write-able by the SAS IT Resource Management administrator and readable by all other SAS IT Resource Management software users.

When SAS IT Resource Management is started using the %CPSTART macro, you have the option of specifying the SITELIB= parameter. This is not required and is usually not specified. If it is specified, the SITELIB= value is used as the SITELIB library for only that invocation. Otherwise, the default SITELIB library will be used.

This default value is stored in the PGMLIB library and is set at installation to be the name of the newly installed SITELIB library. If you need to change that default, submit the following program:

**Note:** Update-access to the PGMLIB library and its components is required.

```plaintext
LIBNAME PGMLIB '!SASROOT/saspqm/cpe/pgmlib';
DATA PGMLIB.CPSITE;
CPSITE="name.of.new-or-updated.SITELIB";
RUN;
```
Appendix M, Installing SAS® IT Security Management 2.6 (Pre-Production)

SAS IT Security Management is a new product that combines new functionality with SAS IT Resource Management. While SAS is confident in the quality of SAS IT Resource Management, we are delivering the new functionality as pre-production. Therefore, for installation instructions specific to installing and running SAS IT Security Management, please use the installation instructions for SAS IT Resource Management above.
Appendix N, Post-Installation Setup for SAS/MDDB Server® Software

SAS/MDDB Server Software includes an OLE DB provider, Open OLAP Server Software. The Open OLAP Server allows you to access, update, and manipulate MDDB data on your SAS System from OLE DB-compliant and ADO-compliant applications on Windows platforms.

The Open OLAP Server is packaged as a self-installing program for Windows platforms and is available on your UNIX SAS Software installation at !SASROOT/misc/mddbserver or on the SAS Client-Side Components CD included with your SAS Software distribution.

The ooscl30.exe file is a Windows executable and must be copied to the Windows platform using a binary transfer protocol such as FTP. The installation instructions for this component can be found at !SASROOT/misc/mddbserver/ooscl30.txt or on the SAS Client-Side Components CD.
Appendix O, Post-Installation Setup for the Metabase Facility

Starting with Version 7 of the SAS System, the SAS/EIS Metabase facility has been converted to the new Common Metadata Repository. The Common Metadata Repository is a general-purpose metadata management facility that provides common metadata services to various metadata-driven applications. The Common Metadata Repository enables applications to share metadata between SAS System products.

Using the Common Metadata Repository requires a one-time setup. If the repository manager was set up in a previous release, it may not need to be set up again. The steps in the following sections should be completed before you attempt to use the Metabase Facility. For Metabase Facility users who were using a release prior to Version 7, using the Common Metadata Repository requires a conversion.

Setting Up the System Repository Manager Files

Complete the following steps to set up the necessary system repository manager files. You must have write access to SASHELP in order to specify the system repository manager.

1. Create a directory that will be dedicated exclusively to the storage of repository manager files, for example: !SASROOT/RPOSMGR

   This directory should not be used to store other SAS files.

2. At a SAS command line, type REPOSMGR and then select Setup Repository Manager.

3. In the Repository Manager Setup window, Library will default to RPOSMGR. For Path, specify the path from Step 1, above, and then select the Write values to system registry check box. Then select OK.

4. In the resulting dialog window, select Yes to generate the necessary repository manager files.

   This completes the setup for the System Repository Manager. You can create additional repository managers (a user repository manager, for example) by repeating the steps above and by using a different path.

   Note: This step sets the default location for the repository manager for your site. Individual users may specify their own repository manager location by following the steps above and not selecting the Write values to system registry check box.
Registering the SASHELP Repository in the Repository Manager

The SASHELP repository is used in various samples, including the SAS/EIS Report Gallery templates. Before beginning the steps below, a repository manager must be created (see previous section). Complete the following steps to register the SASHELP repository in the Repository Manager:

1. At a SAS command line, type REPOSMGR and then select Repository Registration.

2. In the Repository Registration window, select New.

3. In the Register Repository (New) window, type SASHELP (in uppercase) in the Repository field. Then type the full directory path where the CORE catalog is located in the Path field, for example:

   !SASROOT/sashelp

4. In the Description field, you can type any character string (for example, SASHELP Repository). Select OK to close the Register Repository (New) window. Select Close to exit the Repository Registration window.

   Note: Repositories cannot span multiple directories because the path cannot contain concatenated directories. If you have existing metabases in concatenated directories, you should copy the metabases to a single path that will be referenced as a repository.

Converting Version 6 SAS/EIS Metabases to Version 8 Repositories

Please refer to the SAS/EIS software online documentation for instructions on converting Version 6 SAS/EIS metabases to Version 8.
Appendix P, Post-Installation Instructions for Setting up National Language Support (NLS)

This release for NLS contains a variety of new and powerful features. Depending on which version of the SAS System you have installed, there may be additional settings that must be configured. This appendix will guide you through the configuration of these options.

For localized languages, all of the options described in this appendix are set to the default by the system. These settings can be changed in the configuration file, if necessary. Since there are differences between the European and Asian versions of the SAS System, these versions are discussed in separate section to help clarify the applicable options and settings.

Note: The DBCS, DBCSLANG, and DBCSTYPE system options, described in the section “Asian Language Support (ALS)” below, should be used to set locale for Asian languages only. The LOCALE and ENCODING system options, described in “European Language Support (ELS)” on page 97, are for setting locale for European languages.

Asian Language Support (ALS)

This section describes the three SAS System options you should use to set locale for Asian languages or for English with DBCS extensions:

- DBCS
- DBCSLANG
- DBCSTYPE

Information about Asian font catalogs can be found at the end of this section.

DBCS System Option

The DBCS system option specifies if the SAS System recognizes double-byte character sets (DBCS). This option is used for various reasons, including converting lowercase data that are input into the SAS System into uppercase, and supporting Asian languages such as Chinese, Japanese, Korean, and Taiwanese.

DBCS is a toggle option whose values are either DBCS or NODBCS.

- DBCS (specifies that the SAS System process double-byte character sets)
- NODBCS (specifies that the SAS System not process double-byte character sets)

The default value set by the SAS System is NODBCS.
**DBCSLANG System Option**

The `DBCSLANG=` system option shows which double-byte character set (DBCS) language is in use.

*Note:* This option does not accept abbreviations for the language value.

The following table provides valid `DBCSLANG` values for each language:

<table>
<thead>
<tr>
<th>Language</th>
<th>DBCSLANG Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese Simplified</td>
<td>CHINESE</td>
</tr>
<tr>
<td>Chinese Traditional</td>
<td>TAIWANESE</td>
</tr>
<tr>
<td>Korean</td>
<td>KOREAN</td>
</tr>
<tr>
<td>Japanese</td>
<td>JAPANESE</td>
</tr>
<tr>
<td>English</td>
<td>JAPANESE</td>
</tr>
</tbody>
</table>

When DBCS extensions are in effect, Japanese is the default value.

**DBCSTYPE System Option**

The `DBCSTYPE=` system option specifies the type of double-byte character set (DBCS) encoding method. Depending on the platform you are using, valid values for `DBCSTYPE` are as follows:

<table>
<thead>
<tr>
<th>Platform</th>
<th>Primary Encoding Method</th>
<th>Secondary Encoding Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP-UX</td>
<td>HP15</td>
<td>EUC</td>
</tr>
<tr>
<td>AIX</td>
<td>PCIBM</td>
<td>EUC</td>
</tr>
<tr>
<td>TRU-64</td>
<td>DEC</td>
<td>SJIS</td>
</tr>
<tr>
<td>SOLARIS</td>
<td>EUC</td>
<td>SJIS</td>
</tr>
<tr>
<td>Other UNIX platforms</td>
<td>EUC</td>
<td>SJIS</td>
</tr>
</tbody>
</table>

**Changing the Default DBCSLANG and DBCSTYPE Option Settings**

When you install the SAS System and choose to load NLS language translations, the installation automatically sets default values for the `DBCSLANG` and `DBCSTYPE` system options based on the language selection and platform. For example, if you install Primary Japanese on SOLARIS, the configuration file (`!SASROOT/nls/ja/sasv8.cfg`) sets `DBCSLANG` to `JAPANESE` and `DBCSTYPE` to `EUC`.

If you need to change the default settings, edit the configuration file. For example, edit the configuration file to change `DBCSTYPE` to `SJIS`. 
Asian Font Catalogs

Asian font catalogs reside in subdirectories (by language) for easy installation. You can specify the font catalog in either the configuration file or in your SAS session.

Specifying the Font Catalog in the Configuration File

To specify the font catalog in the configuration file (\`!sasroot/nls/langcode/sasv8.cfg\`), use the following statement to assign the font catalog the file:

```bash
-set gfont x !sasroot/nls/langcode/font-name
```

where
- `x` represents a value from 0-9
- `langcode` represents the two-character code for your language (for example, 'JA' is the language code for Japanese)
- `font-name` represents the name of the font you want to use.

Specifying the Font Catalog in a SAS Session

To specify the font catalog in a SAS session, submit the following LIBNAME statement:

```bash
libname gfont x '!sasroot/nls/langcode/font-name'
```

where
- `x` represents a value from 0-9
- `langcode` represents the two-character code for your language (for example, KO is the language code for Korean)
- `font-name` represents the name of the font you want to use.

European Language Support (ELS)

Starting with this release, SAS expands and simplifies its support for national languages. This applies to data as well as to code, and is especially important for international customers who are running applications in client/server, cross-platform environments. Many features have been consolidated into a simple `LOCALE` option for a simplified user interface.

Using the `LOCALE` option, you can set the locale and encoding SAS assumes for external data, catalogs and data sets. The following section provides some specific instructions for installing and setting up your system to run in a locale other than the default. More detailed instructions are provided in the following sections, with specific information about how the options and Locale Setup Window (LSW) influence the SAS System.

If you do plan to select a locale other than the default, you may also benefit from the additional notes starting on page 102. If you will be running SAS as a server on your platform serving a SAS
client on an EBCDIC platform, please see the section “Locale Setup on the Remote Server.” Following this, SAS/GRAPH users will find instructions for setting up the correct devmpaps and keymaps in the section “Devmaps and Keymaps for SAS/GRAPH Software.”

**Background**

A *locale* reflects the local conventions, language, and culture for a particular geographical region. A locale’s conventions may include the formatting of dates, times, and numbers. Locale is not the same as language; a language may be spoken in many countries where conventions are very different. It is also worth noting that a country may have more than one official language. For example, Canada has two languages: English and French.

An *encoding* is a set of characters, with each character having been assigned a unique number. The SAS System uses the encoding to process data.

In Release 8.1, you could run the LSW to select a locale and encoding for the SAS session. Locale information was stored in the SAS Registry and was queried by applications that needed to be aware of the locale name, encoding, Euro character, and translation tables. For example, the SAS session used the trantab information stored in the `CORE\LSW\INIT` registry to set the `TRANTAB` system option at startup.

Starting in this release, three new system options are provided to give you more flexibility in setting up the locale and session encoding for your SAS session. The LSW has been redesigned to allow you to enhance the environment set by these new options.

**NLS-Related System Options**

NLS-related system options were added to this release. The `LOCALE` option allows you to set the locale for your SAS session and sets the `ENCODING`, `DFLANG`, and `TRANTAB` system options. The `ENCODING` option sets the encoding that SAS uses for processing external data. `ENCODING` also sets the `TRANTAB` system option.

These options are valid in the configuration file and at session startup. They are documented in the *SAS Companion for UNIX Environments, Version 8*.

**LOCALE System Option**

The `LOCALE` option specifies a locale setting for your SAS session. When `LOCALE` is set, the `DFLANG`, `TRANTAB`, and `ENCODING` options are also updated to match the locale you selected.

`LOCALE` option values contain the language name. For some locales, you can also specify a country name or region to provide more specific locale information. For example, valid locales for France are `French` and `French_France`. See the *SAS Companion* for the host environment where you run the SAS System for values that can be specified for `LOCALE`.

When `LOCALE` is set, the `DFLANG` system option is set to a value that corresponds to the chosen locale or `English` if no corresponding value is available. For more information about the `DFLANG` option, please refer to *SAS Language Reference: Dictionary, Version 8*. 
The locale you set also has a common encoding that is used most often on the platform where the SAS system is running. When the LOCALE option is set, the ENCODING option is set to match this common locale encoding and also sets the TRANTAB option to support the encoding. However, if the ENCODING option is also specified on the SAS command line or in the config file, the ENCODING option will set the SAS session encoding.

Unlike the LSW, the LOCALE option does not store values in the SAS registry. Run PROC OPTIONS to display the value of the LOCALE option.

**ENCODING System Option**

The ENCODING option sets the encoding that SAS uses for in-memory strings and external files. The ENCODING option can be set by specifying ENCODING at startup or, more commonly, by specifying a value in the LOCALE option that uses an encoding other than the default compiler encoding. Compiler encoding is the encoding used to compile the SAS system. Valid values for ENCODING are listed in the SAS Companion for the host environment where you run the SAS system.

**Note:** ENCODING values on one platform are not necessarily supported on another platform.

When ENCODING is set, the TRANTAB option is also set. On most platforms, all of the first five slots are filled:

- local to transport
- transport to local
- upper case
- lower case
- character classification trantabs

For more information about the TRANTAB option, please refer to the SAS Language Reference.

SAS will assume that external data is in the specified encoding. If your files are in a different encoding, use the ENCODING option in the FILENAME, INFILE, or FILE statement to indicate the correct encoding. If you use the SAS Display Manager to manage your files, you will also need to specify ENCODING in the INCLUDE or FILE commands to indicate an encoding other than the current encoding.

**Locale Setup Window**

In this release, the Locale Setup Window (LSW) has been redesigned to work in conjunction with the new system options described above. Unless you are in Administrator Mode, the LSW will only list the languages that are supported by the current encoding. This allows you to set additional options or safely change to a locale that is supported for that session.

When a new locale is set, the DFLANG system option is set to a value that corresponds to the chosen locale or English if no corresponding value is available. The hex value of the Euro character is also set for the locale. The DFLANG and Euro values are stored in the SAS Registry.

The TRANTAB option string is stored in the registry with the new setting. As in Release 8.1, the LSW does copy the trantabs from the LOCALE catalog into the SASUSER.PROFILE and
SASCfg.HOST catalogs if you have the proper permissions. The LSW will also create trantabs using the TRABASE naming convention at your request.

The LSW does not set the encoding for the SAS session. Please refer to the Locale Setup Window documentation in the SAS System Help for complete information.

**Configuring Your System for Locale**

If you would like to configure your SAS session for a locale other than the default, you have several options. This section shows how to use the options described above to get the results you want from the SAS System.

**Changing the Default LOCALE Option Setting**

When you install the SAS System and choose to load NLS language translations, the installation automatically sets the LOCALE system option to the default value for the language installed. The LOCALE option is set in the system configuration file for each language installed.

For example, !SASROOT/nls/fr/sasv8.cfg sets LOCALE to French by default.

**Note:** The English version does not set the LOCALE by default.

If you want to change the default locale setting for SAS, you can set the LOCALE system option to the appropriate language in your system configuration file.

For example, edit !SASROOT/nls/fr/sasv8.cfg and change -locale French to -locale French_Canadian.

**Running SAS in a Different Locale**

To set the locale for the SAS system at your site, add the LOCALE system option to your configuration file. You can find a list of locale values in the *SAS Companion UNIX Environments*.

When you read or write a file, the SAS System expects the data in the external files to be in the compiler encoding. The compiler encoding is the encoding used to compile the SAS System on the platform where you run SAS. To specify a different encoding, see the documentation for the ENCODING option in the FILENAME, INFILE, or FILE statement in the *SAS Companion UNIX Environments*.

When LOCALE is set, the ENCODING system option will be set to an encoding that supports the language for the locale. The SAS System expects user data to be in the encoding that matches the ENCODING option. If you prefer an encoding other than the most common encoding for the locale, you can also set the ENCODING system option in the configuration file.

When the ENCODING option is set, the TRANTAB option will always be set to match the ENCODING system option. The transport format trantabs, set by the TRANTAB option, are used by the CPORT and CIMPORT procedures to transfer SAS data files. These trantabs are also used by the UPLOAD and DOWNLOAD procedures for transferring files and catalogs, rsubmitting code to the server, and returning logs and listings to the client. However, the transport format trantabs are
not used for SAS data set transfer. Please see the next section for a description of the host-to-host trantabs that are set up by the LSW.

The Output Delivery System (ODS) will create output using the encoding that matches the ENCODING system option. If you would like your output created using a different encoding, please refer to the documentation for the Output Delivery System.

For more information, please see the SAS Procedures Guide, Version 8 in the base SAS software for documentation about PROC CPORT and PROC CIMPORT. Please see the SAS/CONNECT User’s Guide, Version 8 for documentation on PROC UPLOAD and PROC DOWNLOAD.

Configuring Your System with the Locale Setup Window

The Locale Setup Window extends the support of the NLS options. To access the Locale Setup window, select Solutions -> Accessories -> Locale Setup from the SAS Explorer window menu.

You will need to run the LSW in Administrator mode and to select the locale if one of the following conditions is true:

- You are using PROC UPLOAD and PROC DOWNLOAD to transfer a SAS data set, and both your client and server sessions are Version 7 or later.
- Applications at your site reference trantabs created using the TRABASE application.
- You use Remote Library Services or Cross Environment Data Access to access SAS files, views, or external data sets.

For more information, please refer to the Locale Setup Window documentation in SAS System Help.

Running SAS with Special Locale Settings

The LSW extends the support of the locale in your SAS System. The LSW will set the Euro character that matches the encoding and copy the host-to-host trantabs into place. The host-to-host trantabs have a different purpose than then transport trantabs that are set in the TRANTAB system option by the LOCALE and ENCODING system options.

The host-to-host trantabs that the LSW sets up are used by PROC UPLOAD and PROC DOWNLOAD for SAS data set transfer, Cross Environment Data Access (or CEDA), and Remote Library Services (RLS). Please see the SAS/CONNECT User’s Guide for information on the procedures. Also, refer to the SAS/CONNECT User’s Guide and SAS/SHARE User’s Guide for documentation on RLS.

If users at your site need to use trantabs that were created by the Version 6 TRABASE sample program, the LSW can be used to copy those trantabs into place as well.

Additional Information

Depending on the applications you run, additional setup may be required for your system. Please see the sections below for more information about configuring your system to run with alternate locales.
Locale Setup on the Remote Server

The LSW also sets up the remote SAS environment for data transfer. If you are running this release of SAS in a locale other than the default, you can set up the locale on the remote SAS environment by running the LSW or submitting the %lswbatch() macro. Either of these can be run after you signon to the remote session.

If you are using SAS/CONNECT to connect to a remote SAS server, you will need to set up the server session for the locale SAS is using. You must do this after signing on to the remote session.

To set up the locale on the remote session, you can either run the LSW or use the %lswbatch() macro. In the LSW, select your language and set the Remote Submit option before closing the window.

You can also achieve remote locale setup by running the %lswbatch() macro after you signon to the remote session. To set up the locale on the remote session, run %lswbatch with the locale= and remote= parameters. Set the locale= to match the LOCALE option you set for your client session. For example, if you are running MVS with LOCALE=Danish, use the following %lswbatch() macro after your signon to the remote session:

    %lswbatch(locale=Danish, remote=on);

Devmaps and Keymaps for SAS/GRAPH Software

If you are running SAS/GRAPH and your SAS session locale is not the default, you will need to use the devmaps and keymaps for the locale. The devmap and keymap entries you need are in the SASHELP.LOCALE catalog. You will need to copy those that match the locale to your GFONT0.FONTS catalog.

Change the name of the entry to 'default' so they will be loaded for you. For example, a Polish user on an UNIX platform would need to use the devmap and keymap named LAT2.

    libname gfont0 'your-font-library';
    %lswgraph(LAT2);

Here is a list of the devmaps and keymaps that match the locales on your platform:

<table>
<thead>
<tr>
<th>Locale</th>
<th>Devmap and Keymap Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic</td>
<td>arab</td>
</tr>
<tr>
<td>Bulgarian</td>
<td>cyrl</td>
</tr>
<tr>
<td>Byelorussian</td>
<td>cyrl</td>
</tr>
<tr>
<td>Croatian</td>
<td>lat2</td>
</tr>
<tr>
<td>Czech</td>
<td>lat2</td>
</tr>
<tr>
<td>Danish</td>
<td>lat9</td>
</tr>
<tr>
<td>Dutch</td>
<td>lat1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Locale</th>
<th>Devmap and Keymap Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>German_Switzerland</td>
<td>lat9</td>
</tr>
<tr>
<td>Greek</td>
<td>grek</td>
</tr>
<tr>
<td>Hebrew</td>
<td>hebr</td>
</tr>
<tr>
<td>Hungarian</td>
<td>lat2</td>
</tr>
<tr>
<td>Icelandic</td>
<td>lat1</td>
</tr>
<tr>
<td>Italian</td>
<td>lat9</td>
</tr>
<tr>
<td>Italian_Italy</td>
<td>lat9</td>
</tr>
</tbody>
</table>
Additional Documentation

This section lists documentation referenced throughout the appendix. Please refer to these documents for more detailed information.

- “Locale Setup Window” and “Locale Setup Window Item Descriptions” in the SAS System Help
- SAS Companion for UNIX Environments, Version 8
- SAS Language Reference: Dictionary, Version 8
Appendix Q, Post-Installation Setup for SAS® OLAP Server Software

Setting up Access Control without SAS/EIS Software on Your Server

Please keep in mind that Access Control Setup consists of three steps:

1. Set your Access Control Key - modifies SASHELP.MB
2. Set your Access Control environment (aclroot, ac_active flag, etc.) - modifies SASHELP.AC
3. Create your Access Control definitions (users, groups, the actual ACL) – data sets PASSWD, GROUPS, and ACL in aclroot

Each of these steps can be performed interactively in a set of windows (where available) or programmatically.

Starting the Access Control Setup Dialog Window

Use the command AF C=SASHELP.EISSRV.STARTAC.SCL <USER=uid PASSWD=password>

Follow the instructions in Help or the description in SAS/EIS Software: Administrator’s Guide - Access Control Tasks to assist you through the setup process. On 3270 platforms, where the Access Control Setup GUI is not very comfortable to use, you may prefer to do your AC setup programmatically. Please see the following section for more information on that subject.

Setting Your Access Control Key and Environment Programmatically

Setting the Access Control Key

The Access Control Key is stored in the entry SASHELP.MB.ACLAPWM.SCL. You need write access to this entry in order to change the Access Control Key. Please refer to How to set up write access to SASHELP.AC and SASHELP.MB for more information.

Using a command

Use the following command to set the Access Control Key (for setting the Access Control Key to ADMIN):

105
To reset the Access Control Key to its initial status (no key set), pass in an empty string ("").
- Use the special value "0" to use no Access Control Key.
- Use the option ECHO=Y to dump the settings in the log.

Using a statement

Use the following command to submit the command as a SAS statement:

```
DM 'AF C=SASHELP.EISSRV.SETAPW.SCL PW=ADMIN';
```

Using SCL

Within SCL code, you can use the following method call to set the Access Control Key:

```
CALL METHOD ('SASHELP.MBEISSRV.APWUTIL','CREAAPWM', flag, pw-value, rc);
```

where

- flag is ‘0’ or ‘1’. A ‘0’ indicates to not use a control key; ‘1’ indicates to use a control key
- pw-value is the value of the new control key. If flag is ‘0’, this value is ignored
- rc is ‘0’ if the update was successful; ‘1’ if it was not successful

Setting the Access Control Environment

The Access Control Environment information is stored in the entry SASHELP.AC.ACLINIT.SCL. You need write access to this entry in order to change the Access Control Environment settings. Please refer to How to set up write access to SASHELP.AC and SASHELP.MB for more information.

Using a command

Use the following command to set the Access Control Environment:

```
AF C=SASHELP.EISSRV.SETAC.SCL
APW=access control key
ACTIVE=Y/N
ACLRoot=access control root path
ACLSERV=server
LOGIN=login application
AUTOUSER=Y/N
LIBSEC=Y/N
PW_ENCRYPT=Y/N
DISP_CLASS=access control start class
QUERY_CLASS=access control query class
SERVER_CLASS=access control server class
ADMIN_CLASS=access control administration class
ECHO=Y
```
Using a statement

Submit the previous command using a DM statement, e.g.,

```
DM 'AF C=SASHELP.EISSRV.SETAC.SCL APW=ADMIN ACTIVE=Y ACLROOT="path"';
```

Using SCL

Within SCL code, you can use the following method call to set the Access Control Environment:

```
CALL METHOD ('SASHELP.EISSRV.ACLUTIL', 'CREAACLI', rc, flag active, aclroot, aclserv, login_window, autouser_enabled, libsec, pw_encrypt, disp_class, query_class, server_class, admin_class);
```

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APW</td>
<td>The Access Control Key (required for <code>setac</code>)</td>
</tr>
<tr>
<td>ACTIVE</td>
<td>Y/N to switch access control on or off</td>
</tr>
<tr>
<td>ACLROOT</td>
<td>The path of a directory that holds the ACL files</td>
</tr>
<tr>
<td>ACLSERV</td>
<td>The name of the remote session or share server for ACLROOT. If the session is local, this parameter should be blank.</td>
</tr>
<tr>
<td>LOGIN</td>
<td>The four-level name of the AF application or APPLSCR to use as a login dialog. The default is <code>SASHELP.EISSRV.GATE_KPR.FRAME</code>. A dialog with entry for User ID and Password, and OK and Cancel buttons. There is one other login dialog provided with the system, <code>SASHELP.EISSRV.GATE_KP2.FRAME</code>, which has an additional Change Password button.</td>
</tr>
<tr>
<td>AUTouser</td>
<td>Y/N to indicate whether to allow the use of the <code>USER=</code> and <code>PASSWD=</code> options on the EIS, RUNEIS, and METABASE commands. If these options are given, no login dialog appears (Default=Y)</td>
</tr>
<tr>
<td>LIBSEC</td>
<td>Y/N to indicate when the temporary library to access access control files will be allocated. ‘Y’ (default): the ACLTMP library is allocated before and deallocated after each access to the ACL files. Use this setting to assure that the ACL files don’t show up in the SAS Explorer. ‘N’: the ACLTMP library is allocated once at access control server initialization and deallocated at access control server termination.</td>
</tr>
<tr>
<td><strong>PW_ENCRYPT</strong></td>
<td>Y/N indicates whether to encrypt the user password stored in the PASSWD file. (Default=Y).</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td><strong>DISP_CLASS</strong></td>
<td>The class used to start the access control subsystem and optionally display a login dialog. The default is SASHELP.EISSRV.ACLDISP.CLASS</td>
</tr>
<tr>
<td><strong>QUERY_CLASS</strong></td>
<td>The class used to satisfy queries on the current access control permissions. The default is SASHELP.MB.ACLMAIN.CLASS.</td>
</tr>
<tr>
<td><strong>SERVER_CLASS</strong></td>
<td>The class used for loading and persisting acl information. The default is SASHELP.EISSRV.ACLSERV.CLASS.</td>
</tr>
<tr>
<td><strong>ADMIN_CLASS</strong></td>
<td>The class used for managing user and group information and for updating the ACL. The default is SASHELP.MB.ACLADMIN.CLASS.</td>
</tr>
<tr>
<td><strong>ECHO=Y</strong></td>
<td>Dump the current and updated settings in the LOG.</td>
</tr>
<tr>
<td><strong>RC</strong></td>
<td>(creaacl only) a flag that indicates if the update was successful, where ‘0’ indicates that the update was successful and ‘1’ indicates that it was not.</td>
</tr>
</tbody>
</table>

### Setting Your Access Control Definitions (Users, Groups, ACL) Programmatically

To set your Access Control definitions programmatically, you need to know some basics about the storage of User and Group information and the actual Access Control List.

The Access Control definitions are stored in three data sets in the Access Control Root Path. The data sets are password-protected and encrypted using the Access Control Key.

User definitions are stored in the PASSWD data set. Group definitions are stored in the GROUPS data set. The Access Control List is stored in the ACL data set.

To set your definitions, follow these steps:

1. Set up the Access Control Key and Environment  page 109
2. Set a libname ACL on your aclroot path  page 109
3. Define the groups  page 109
4. Define the users  page 112
5. Create your metabase registrations  page 112
6. Create your ACL  page 112
   a. Initialize partial ACL data sets  page 112
   b. Edit the partial ACL data sets  page 113
   c. Merge the partial ACL data sets  page 116
1. Set up the Access Control Environment

Here is a simple example of how to set up the Access Control Environment. Choose an Access Control Key, and create a location where you want to store your AC definitions. Then submit:

DM 'AF C=SASHELP.EISSRV.SETAPW.SCL PW=access control key';
DM 'AF C=SASHELP.EISSRV.SETAC.SCL APW=access control key
ACLROOT="access control root path"
PW_ENCRYPT=N';

*Note:* By default, user passwords stored in the PASSWD data set are encrypted using the _encryptPassword method of the ACLSERV class. This adds an additional layer of protection to the information stored in the PASSWD data set. To be able to store plain text passwords in the PASSWD data set when managing the user setup outside of the Access Control definition dialogs, use PW_ENCRYPT=N option when setting up the access control environment.

2. Set a libname ACL on your aclroot path

LIBNAME ACL "access control root path";

3. Define the groups

The GROUPS data set holds the names and descriptions of the access control groups. The data set has one record for each group defined to the system. When the GROUPS data set is initially created, two additional records are also added, one for the SYSTEM (Administrator) and another for the USERS (Users) group.

A group name can have from three to eight characters. Group names begin with a letter, and are followed by letters, numbers, or underscores. Letters must be in upper case.

The GROUPS data set has the following structure:

<table>
<thead>
<tr>
<th>GROUP</th>
<th>$8</th>
<th>Group Name (needs to be upper case!)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESC</td>
<td>$32</td>
<td>Group Description</td>
</tr>
</tbody>
</table>

You can edit the acl.groups data set by using an interactive facility, like FSEDIT, or FSVIEW, or data management tools like the data step.

Example for using a data step:

data work.groups;
infile datalines;
length group $8 desc $32;
input group / desc &;
datalines;
SALES
Sales Staff
Group names must be upper case valid SAS names, of three to eight characters length.

Please note that when you first activate Access Control (using either the Access Control Setup window or the SETAC facility) a GROUPS data set is created in your aclroot path, with the two groups SYSTEM and USERS already defined. That is why the previous data step merges your new definitions with the already existing ones.

4. Define the users

The PASSWD holds the definitions for the access control users. The following information is stored for each user:

<table>
<thead>
<tr>
<th>User id</th>
<th>A 32-character string that must start with a character, followed by characters, numbers, or underscores. The userid is stored in upper case.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Mixed case, free format descriptive string.</td>
</tr>
<tr>
<td>Groups</td>
<td>Names of the groups a user belongs to, in upper case, separated by commas.</td>
</tr>
<tr>
<td>Password</td>
<td>A 16-character string that must start with a character, followed by characters, numbers, or underscores. By default, this password is stored encrypted using the _encryptPassword method of the ACLSERV class. Use PW_ENCRYPT=N when setting up the access control environment to use unencrypted passwords. Unencrypted passwords are stored in upper case.</td>
</tr>
<tr>
<td>Creation date/time</td>
<td>A SAS datetime value indicating the creation time of the user’s record.</td>
</tr>
</tbody>
</table>

The data set holds one record for each user of the system. When the PASSWD data set is initially created, one record for the ADMIN user (password ADMIN) is added.
The **PASSWD** data set has the following structure:

<table>
<thead>
<tr>
<th>User ID</th>
<th>$32</th>
<th>User ID (upper case)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FULLNAME</td>
<td>$32</td>
<td>User Description</td>
</tr>
<tr>
<td>GROUP</td>
<td>$198</td>
<td>User Groups</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>$16</td>
<td>User Password</td>
</tr>
<tr>
<td>C_DATET</td>
<td>$8</td>
<td>DateTime</td>
</tr>
</tbody>
</table>

You can edit the **acl.passwd** data set by using an interactive facility, like **FSEDIT**, or **FSVIEW**, or a data management tool like the data step.

**Example for using the data step:**

```sas
data work.passwd;
infile datalines dsd;
length userid fullname $32 group $198 password $16 c_datet 8;
format c_datet datetimel6.;
c_datet=time();
input userid / fullname & / group / password ;
datalines;
MJONES
Markus Jones
SALES
MJONES1
OFIELDS
Oscar Fields
MKT
OFIELDLS1
ABEAN
Abraham Bean
SALES,MKT,MGMT
ABEAN1
;
proc sort data=work.passwd;
by userid;
proc sort data=acl.passwd(pw=admin);
by userid;
data acl.passwd(pw=admin);
merge acl.passwd(pw=admin) work.passwd;
by userid;
run;
```

Userids must be upper case valid SAS names, of 3 to 32 characters length. Passwords must be upper case valid SAS names, of 3 to 16 characters length.
Please note that when you first activate Access Control (using either the Access Control Setup window, or the SETAC facility) a PASSWD data set is created in your aclroot path, with the user ADMIN (password ADMIN) already defined. That is why the previous data step merges your new definitions with the already existing ones.

5. Create your metabase registrations

If you have not already done so, create your metabase registrations now. An Access Control definition is always linked to an existing metabase registration.

Use the METABASE command to invoke the Metabase GUI.

6. Create your ACL

For each group/metabase registration combination, fill a data set with the structural information from the metabase registration, and, if needed and available, with the class column value combinations. There is a utility, FILLACL, that does that for you. Edit those partial data sets to set your access control tags. Finally, merge the partial ACL data sets back into ACL.ACL.

A. Initialize partial ACL data sets

**Note:** The FILLACL utility uses the SAS OLAP Server classes to access the data. If you do not have SAS/EIS software, you might have to run the following utility first, to make sure the correct data model classes are being used:

```dm
DM 'AF C=SASHELP.EISSRV.SET_OLAP_CLASSES.SCL
MODMGR=SASHELP.EISSRV.MODMGR.CLASS
MODMGRE=SASHELP.EISSRV.MODMGRE.CLASS
EMDDB_C=SASHELP.EISSRV.EMDDB_C.CLASS';
```

Use the FILLACL utility to create a data set with the same structure as the ACL data set, and initialize it with information from the registration and the data.

```dm
DM 'AF C=SASHELP.EISSRV.FILLACL.SCL
APW=access control key
OUTDS=partial ACL data set name
GROUP=groupname
REP="repository name"
REG="registration name"
LEVEL=ALL/DIMSONLY';
```

using a different OUTDS= value each time, and setting the other options accordingly.
FILLACL accepts the following named parameters:

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APW</td>
<td>The access control key. This is required.</td>
</tr>
<tr>
<td>OUTDS</td>
<td>The data set where the partial ACL file should be written. If the data set exists, it will be overwritten.</td>
</tr>
<tr>
<td>GROUP</td>
<td>Name of the user group for initializing the GROUP column (upper case!)</td>
</tr>
<tr>
<td>REP</td>
<td>The name of the repository in which the registration is stored. Use quotes if the repository name contains blanks or special characters.</td>
</tr>
<tr>
<td>REG</td>
<td>The name of the metabase registration to use. Please note that the typical registration name has the form LIB.MEM, e.g., SASHELP.PRDMDDB. By default, a metabase registration has the name of the SAS file (data set or MDB) that was registered.</td>
</tr>
<tr>
<td>LEVEL</td>
<td>ALL/DIMSONLY. ALL is the default. DIMSONLY only reads out the structural information, no data values.</td>
</tr>
</tbody>
</table>

B. Edit the partial ACL data sets

Edit each data set created by FILLACL, using an interactive facility like FSEDIT or FSVIEW. Usually, you would only edit the TAG column. Use TYPE, VALUE, and ITEM to identify the element for which a tag will be set.

For example, to drop the COUNTRY variable, find the record with TYPE=CL, VALUE=COUNTRY, and set a ‘D’ in the TAG column.

Do not set any values for TAG in those records that you do not want to restrict. These records will be removed when merging the partial ACL data sets in the next step.

Each partial ACL has the following structure:

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP</td>
<td>$8</td>
</tr>
<tr>
<td>TARGET</td>
<td>$17</td>
</tr>
<tr>
<td>TYPE</td>
<td>$2</td>
</tr>
<tr>
<td>ITEM</td>
<td>$42</td>
</tr>
<tr>
<td>VALUE</td>
<td>$200</td>
</tr>
<tr>
<td>TAG</td>
<td>$1</td>
</tr>
</tbody>
</table>

The columns hold the following information: Column name, Description – values.

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP</td>
<td>Name of the group to which the access control definitions in the current record apply (upper case!)</td>
</tr>
<tr>
<td>TARGET</td>
<td>The ID of the metabase registration to which the access control definitions in the current record apply, or #A, for applications/application databases, or #F, for application functions.</td>
</tr>
</tbody>
</table>
| TYPE   | Record type:  
If TARGET is a metabase registration ID:  
T Table  
H Hierarchy  
HL Hierarchy Level  
A Analysis variable (ANALYSIS, COMPUTED)  
S Statistic  
C Category variable (CATEGORY)  
CL Category variable level (data value)  
If target is #A:  
AP for application  
AD for application database  
If target is #F: Always F |
<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>TABLE (dummy value when the whole table is being dropped)</td>
</tr>
<tr>
<td>H</td>
<td>Hierarchy name</td>
</tr>
<tr>
<td>HL</td>
<td>Hierarchy level name</td>
</tr>
<tr>
<td>A</td>
<td>Analysis variable name</td>
</tr>
<tr>
<td>S</td>
<td>Statistic keyword</td>
</tr>
<tr>
<td>C</td>
<td>Category variable name</td>
</tr>
<tr>
<td>CL</td>
<td>Category variable value. Special value #T for <em>Total</em></td>
</tr>
<tr>
<td>AP</td>
<td>Application name (2-level)</td>
</tr>
<tr>
<td>AD</td>
<td>Application Database name (4-level)</td>
</tr>
<tr>
<td>F</td>
<td>Function id.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Additional identifier, set to identify what the VALUE refers to for</th>
</tr>
</thead>
<tbody>
<tr>
<td>HL</td>
<td>to identify the hierarchy</td>
</tr>
<tr>
<td>CL</td>
<td>to identify the Category variable</td>
</tr>
<tr>
<td>S</td>
<td>to identify the Analysis variable</td>
</tr>
<tr>
<td>TAG</td>
<td>Access Tag. This is the only column you would typically edit. Valid tags are as follows:</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>D</td>
<td>Drop</td>
</tr>
<tr>
<td>K</td>
<td>Keep</td>
</tr>
<tr>
<td>I</td>
<td>Initial</td>
</tr>
<tr>
<td>H</td>
<td>Hide</td>
</tr>
<tr>
<td>S</td>
<td>Show</td>
</tr>
</tbody>
</table>

Valid TAGs by TYPE:

<table>
<thead>
<tr>
<th>TAG</th>
<th>T</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>D, K, H</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>D, K</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>D, K</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>D, K</td>
</tr>
<tr>
<td></td>
<td>CL</td>
<td>D, K, I, H, S</td>
</tr>
<tr>
<td></td>
<td>HL</td>
<td>D, K, I</td>
</tr>
<tr>
<td></td>
<td>AP</td>
<td>D, K</td>
</tr>
<tr>
<td></td>
<td>AD</td>
<td>D, K</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>D, K</td>
</tr>
</tbody>
</table>

C. Merge the partial ACL data sets

The result is a collection of data sets. To merge them and remove the unneeded observations (the ones with `TAG=''`), submit:

```sas
data acl.acl(pw=access control key encrypt=yes);
set work.one
work.two
...;
if tag = '' then delete;
run;
```
Write Access to SASHELP.AC and SASHELP.MB

1. Choose an empty library or path for use as a playpen. Later you can either merge it into your SASHELP library, or concatenate it in front of your SASHELP path.

   libname playpen 'path';
   proc catalog;
       copy in=sashelp.ac out=playpen.ac;
       copy in=sashelp.mb out=playpen.mb;
       select aclapwm.scl;
   run;quit;

   catname sashelp.ac (playpen.ac);
   catname sashelp.mb (playpen.mb sashelp.mb);

2. Set up your Access Control Key and Environment. When setting up your SAS application server, or distributing the application to your users, make sure the modified catalogs are concatenated in front of your SASHELP path by modifying the SAS CONFIG file, or the SAS clist accordingly.

Specifying OLAP Classes

The following utility program can be used to override the default OLAP Server classes and specify your custom OLAP Server classes.

   DM 'AF C=SASHELP.EISSRV.SET_OLAP_CLASSES.SCL
      MODMGR=
      MODMGRE=
      EMDDDB_C=
      DP=
      MDVIEWER=
      MDMODEL=
    ';

SET_OLAP_CLASSES accepts the following named parameters:

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODMGR</td>
<td>The 4-level name of the model manager class.</td>
</tr>
<tr>
<td>MODMGRE</td>
<td>The 4-level name of the model manager engine class.</td>
</tr>
<tr>
<td>EMDDDB_C</td>
<td>The 4-level name of the model coordinator class.</td>
</tr>
<tr>
<td>DP</td>
<td>The 4-level name of the data provider class.</td>
</tr>
<tr>
<td>MDVIEWER</td>
<td>The 4-level name of the OLAP metadata viewer class.</td>
</tr>
<tr>
<td>MDMODEL</td>
<td>The 4-level name of the OLAP metadata model class.</td>
</tr>
</tbody>
</table>
Appendix R, Installing SAS® Process Intelligence

Installation Steps

SAS Process Intelligence is composed of four tiers: Client, Middle, SAS Application, and Data. An optional tier - the Admin Tier - may be part of the installation, depending on your configuration. The following steps must be completed:

1. Verify that you have Internet Explorer, Version 5.5 with Service Pack 2 or Internet Explorer, Version 6 installed on any Windows client machine that will access SAS Process Intelligence. You can verify by selecting Internet Explorer’s Help pull-down menu, then the About Internet Explorer menu option to see version and update information. This is the Client Tier of SAS Process Intelligence.

   **Note:** Even though SAS Process Intelligence is completely functional with Microsoft Internet Explorer, Version 5.5 with Service Pack 2 and with Internet Explorer, Version 6, it is recommended that you use Microsoft Internet Explorer, Version 6 with Service Pack 1 to avoid the following issue.

   According to the Microsoft Knowledge Base Article - 318761:

   “When you browse to either a Rich Text Format (.rtf) file or to a Comma Separated Value (.csv) file that is located on a Web server, Internet Explorer may prompt you with a File Download dialog box to confirm whether to open the file or to save the file to your computer:

   You are downloading the file:

   filename

   Would you like to open the file or save it to your computer?

   “The **Open button** and the **Always ask before opening this type of file** check box of the dialog box may appear dimmed, which indicates that the options are unavailable.”

   For more information on this article, please refer to

2. Install the SAS Application Tier of SAS Process Intelligence on UNIX or Windows. The SAS Application Tier will automatically be installed in `!SASROOT/pri`, which will be referred to throughout these instructions as `PRI_root_dir_name`. The operating system on which you choose to install the SAS Application Tier will become the server for SAS Process Intelligence. The SAS Application Tier is composed of:
**The SAS System, Release 8.2 (TS2M0) for Windows or The SAS System, Release 8.2 (TS2M0)**

It is recommended that you choose the “complete installation” option. Please note that the SAS System media set installed in this step should be the set that includes the *SAS Process Intelligence Web Application Components* CD, even though the *SAS Process Intelligence Web Application Components* CD will not get installed until Step 3.

3. **Install the Middle Tier of SAS Process Intelligence on UNIX or Windows.**

   The Middle Tier is composed of the following pieces:

   A. a Web server with CGI capability, such as Apache HTTPD or Microsoft IIS. You must have a Web server with CGI capability installed. Make sure that your Web server and JSP/Servlet container are configured to properly communicate and work together.

   B. Java 2. Standard Edition (J2SE). If you do not already have J2SE 1.3.1_03 installed, it will be installed for you when you install the SAS Process Intelligence Middle Tier.

   C. a JSP/Servlet container, such as Tomcat or Allaire JRUN. You must have a JSP/Servlet container installed. Make sure that your Web server and JSP/Servlet container are configured to properly communicate and work together.

   D. the *SAS Process Intelligence Web Application Components* CD. You must install the SAS Process Intelligence Web Applications Components CD on the same machine where you installed your Web server and JSP/Servlet container. Note that this can be on a different machine from where you installed the SAS Application Tier.

   If you are using Tomcat as your JSP/Servlet container, install under the `webapps` directory. If you are using another JSP/Servlet container, you can either accept the default location or specify a different location. The location where you install will be referred to throughout these instructions as `PRI_midtier_root_dir_name`.

   If you are not using Tomcat as your JSP/Servlet container, create a new web application (such as `PRI`) in the JSP/Servlet container from `PRI_midtier_root_dir_name`. This web application name must match the value for the `web_server` variable determined in The SAS Application Tier.


   F. a WebDav-compliant server, such as Intraspect or Microsoft SharePoint Portal Server, if you are using the SAS Process Intelligence Collaborative Space.

4. If you received only one SAS System, the Admin Tier of SAS Process Intelligence was installed in Step 2. Proceed to the Post-Installation Steps below.
If you received two SAS Systems, you now need to install the Admin Tier of SAS Process Intelligence on UNIX or Windows. The operating system on which you choose to install the Admin Tier will become the administrator for SAS Process Intelligence. The Admin Tier must be installed on a different machine from where you installed the SAS Application Tier and Middle Tier. The Admin Tier is composed of:

*The SAS System, Release 8.2 (TS2M0)* for Windows or *The SAS System, Release 8.2 (TS2M0)*

Install the Data Tier of SAS Process Intelligence on UNIX or Windows. The Data Tier can be installed in any of these locations:

- on the same machine where you installed the SAS Application Tier
- on the same machine where you installed the Middle Tier
- on the same machine where you installed the Admin Tier
- on a different machine

The Data Tier is composed of either Oracle, DB2, or your existing SAS System, Release 8.2 data sets.

**Post-Installation Steps**

**The Client Tier**

After verifying that you have Internet Explorer, Version 5.5 with Service Pack 2 or Internet Explorer, Version 6 installed on any Windows client machine that will access SAS Process Intelligence, the following Internet Explorer browser settings are **required** for optimal performance with SAS Process Intelligence.

To change the Internet Explorer browser settings, choose the Tools pull-down menu, then the Internet Options menu option, then the Advanced tab, and change the following settings:

1. Under **Browsing**, turn off the setting Reuse windows for launching shortcuts.
2. Under **Multimedia**, turn on Show pictures.

The following Internet Explorer browser settings are **recommended** for optimal performance with SAS Process Intelligence:

1. Under **Browsing**, turn off Automatically check for IE updates.
2. Under **Browsing**, turn on Disable script debugging.
3. Under **Browsing**, turn off Display a notification about every script error.
4. Under **Microsoft VM**, turn on JIT compiler for virtual machine enabled.
5. Under **Multimedia**, turn on Smart image dithering.
Under security for the zone that SAS Process Intelligence is part of, the following Internet Explorer browser settings are required. To change the Internet Explorer browser settings, choose the Tools pull-down menu, then the Internet Options menu option, and then the Security tab. From here, select the Local Intranet Zone, click the Custom Level button, and change the following settings:

1. Under Cookies, enable both Stored and Per-session.
   
   Note: This option is not available for Microsoft Internet Explorer, Version 6

2. Under Downloads, enable File Download (for downloading a data set).

3. Under Microsoft VM, set Java permissions to Medium safety.

4. Under Scripting, enable Active scripting.

5. Under Scripting, enable Scripting of Java applets.

6. Under Logon, set logon to Automatic logon only in Intranet zone. Do not set logon to Anonymous logon.

The SAS Application and Admin Tiers

If you are installing just the Admin Tier, complete only step 6 in this section, after installing the Admin Tier.

If you are installing the SAS Application Tier only, or both the SAS Application and Admin Tiers, complete all steps in this section after installing either or both tiers.


   Note: While the SAS Technical Support Hot Fix page categorizes hot fixes based on the operating system (Solaris 32 vs. Solaris 64), you should retrieve your hot fix based on your SAS implementation (32 or 64-bit enabled).

   - Base SAS Software Hot Fix 82BA04 (for Windows only)
   - Base SAS Software Hot Fix 82BB13 (for Windows only)
   - Base SAS Software Hot Fix 82BB32
   - SAS Integration Technologies Software Hot Fix 82IH03
   - SAS Integration Technologies Software Hot Fix 821H10
   - SAS/Connect Software Hot Fix 82CT07 (SAS Note SN-010167)

If you are installing both the SAS Application and Admin Tiers, install this hot fix as well:

   - SAS/Warehouse Administrator Software Hot Fix 82WH02

2. Ensure that e-mail is configured via the sasv8.cfg file. You will need to add lines similar to the following to the sasv8.cfg file located in the !SASROOT directory:
-emailsys smtp
-emailhost mailhost.<yourcompany>.com
-emailport 25

Important: If you install on a Windows system, ensure that a printer driver has been installed. You will need to invoke SAS with the -uprint parameter, which activates Universal Printing. Refer to SAS Note 005589 for required printer configuration.

3. On UNIX, the person who installs the software from the media must use the same UNIX file ownership permissions as the person who runs the PRI_Initial_Setup.sas, PRI_Initial_Data_Load.sas, and PRI_Incremental_Data_Load.sas programs to set up the Process Intelligence sample data. Otherwise, permission violations will occur, and the data load will fail.

IMPORTANT: Before you allow UNIX end-user access to the user interface, and/or allow additional UNIX users to run the data load programs, refer to the Configuration Guide for instructions on modifying the Process Intelligence file permissions.

If this step is omitted, every user except the installer will receive permission violations resulting in failure to create or load data sets. This affects user-defined data sets created through the User Interface as well as data sets created or modified by the data load programs.

4. Start the SAS System in interactive/dms mode by submitting the following command:

- On UNIX:
  !SASROOT/sas -autoexec PRI_root_dir_name/autoexec.sas -dms &

- On Windows:
  !SASROOT\sas.exe -autoexec PRI_root_dir_name\autoexec.sas

Note: Under Windows, if the PRI_root_dir_name path contains any spaces, the value for PRI_root_dir_name must use the DOS-style path name (for example, c:\progra~1\sasins~1\sas\v8\pri) in the specification of the -autoexec option. Or, if a Shortcut is defined, the option may be omitted, and the Start In: directory set using the DOS-style path name. This is necessary for correct execution of parallel processing during data loading and enrichment activities. Refer to Step 2 under Installation Steps above for more information about the PRI_root_dir_name path.

5. The autoexec.sas program allocates the autoexec data set in read-only mode.

A. To edit the data set and define your site’s configuration, submit the command
   %whs_edit_autoexec; from the SAS Program Editor. This will open the SAS data set
   AUTOLIB AUTOEXEC (operating system name:
   PRI_root_dir_name/autoexec.sas7bdat in the vt (viewtable) editor.
**Note:** By default, Viewtable displays column labels instead of column names. To see the column names, select View->Column Names from the pull down menus.

**B.** You must edit the default row. Optionally, you may customize the configuration as described below in the Autoexec Data Set Description table, using the field descriptions to match your installation environment.

Create a row for each SAS Application tier configuration under which you plan to run the Process Intelligence Solution. Each row is identified by a unique value for the `pkprofile` column, and describes the data storage locations and operational characteristics to be used. For example, you will want to identify a row to use when creating the sample data, probably using SAS as the repository, as well as rows identifying your actual repository (SAS|Oracle|DB2) and test or production data storage locations.

The row to be used when running the Process Intelligence Solution in a given situation will be identified via a `-set pkprofile` option on the SAS command. Any of the autoexec data set values may be overridden in the same way. If you do not specify a `pkprofile` value, the first row will be used.

**Note:** Under UNIX operating systems, the environment variable name must be in lower case.

**C.** Optionally, if you are installing the Admin Tier on a different machine from the Application Tier, you may have a separate `AUTOLIB.AUTOEXEC` data set with profiles specific to that machine.

**D.** Save and close the autoexec data set after completing your edits. Exit your SAS session.

### Autoexec Data Set Description

* = required under certain configuration conditions.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Row</th>
<th>Req.</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pkprofile</td>
<td>1</td>
<td>Yes</td>
<td>Char</td>
<td>Profile name identifying observation to use in autoexec.</td>
</tr>
<tr>
<td>pkroot</td>
<td>2</td>
<td>Yes</td>
<td>Char</td>
<td>Root directory for Process Intelligence Solution.</td>
</tr>
<tr>
<td>pk_udm_db_engine_name</td>
<td>3</td>
<td>Yes</td>
<td>Char</td>
<td>Name of the UDM Data Repository Engine (SAS/DB2/Oracle).</td>
</tr>
<tr>
<td>pk_udm_db_libname_options</td>
<td>4</td>
<td>*</td>
<td>Char</td>
<td>Options for the UDM Data Repository libref. *Must be supplied when using repositories other than SAS.</td>
</tr>
<tr>
<td>udm</td>
<td>5</td>
<td>*</td>
<td>Char</td>
<td>UDM Directory for Process Intelligence data stored in SAS (default=&amp;PKRoot/PKData). *Must be</td>
</tr>
<tr>
<td>Field Name</td>
<td>Row</td>
<td>Req.</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----</td>
<td>------</td>
<td>------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>pk_agent_db_engine_name</td>
<td>6</td>
<td>Yes</td>
<td>Char</td>
<td>Name of the Agent Repository (SAS/DB2/Oracle).</td>
</tr>
<tr>
<td>pk_agent_db_libname_options</td>
<td>7</td>
<td>*</td>
<td>Char</td>
<td>Options for the Agent Repository libref. *Must be supplied when using repositories other than SAS.</td>
</tr>
<tr>
<td>pkagent</td>
<td>8</td>
<td>*</td>
<td>Char</td>
<td>Directory for Agent Repository data stored in SAS. (default=&amp;PKRoot/PKData/PKAgent) *Must be supplied when using SAS as the repository.</td>
</tr>
<tr>
<td>pkuser</td>
<td>9</td>
<td>Yes</td>
<td>Char</td>
<td>Location of the PKUser directory. This directory contains the user build data sets and metadata. (default= &amp;PKRoot/PKUser)</td>
</tr>
<tr>
<td>pkmeta</td>
<td>10</td>
<td>Yes</td>
<td>Char</td>
<td>Directory for PKMeta Data (default=&amp;PKRoot/PKData/PKMeta)</td>
</tr>
<tr>
<td>pkwarehouse</td>
<td>11</td>
<td>Yes</td>
<td>Char</td>
<td>Root Directory for Process Intelligence Warehouse Environment (default=&amp;PKRoot/PKWarehouse)</td>
</tr>
<tr>
<td>usrmeta</td>
<td>12</td>
<td>Yes</td>
<td>Char</td>
<td>Directory for UsrMeta Data (default= &amp;PKRoot/PKData/USRMeta.) Note: Under UNIX, for proper execution using the default value, it must be edited to match the case of the actual directory name &amp;PKRoot/PKData/UsrMeta.</td>
</tr>
<tr>
<td>web_server</td>
<td>13</td>
<td>Yes</td>
<td>Char</td>
<td>URL for PRI web application. See Step 3D under Installation Steps for more information.</td>
</tr>
<tr>
<td>webdav_server</td>
<td>14</td>
<td>Yes</td>
<td>Char</td>
<td>URL used with WEBDAV_USER defined user ID.</td>
</tr>
<tr>
<td>webdav_user</td>
<td>15</td>
<td>Yes</td>
<td>Char</td>
<td>User ID for WEBDAV_USER defined user ID.</td>
</tr>
<tr>
<td>webdav_pw</td>
<td>16</td>
<td>Yes</td>
<td>Char</td>
<td>Password used with WEBDAV_USER defined user ID.</td>
</tr>
<tr>
<td>Field Name</td>
<td>Row</td>
<td>Req.</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----</td>
<td>------</td>
<td>------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>pkstate</td>
<td>17</td>
<td>Yes</td>
<td>Char</td>
<td>PK Run State (DEVL</td>
</tr>
<tr>
<td>pkplaypen</td>
<td>18</td>
<td>No</td>
<td>Char</td>
<td>Optional location of development directory storing .sas files and/or a catalog containing .macro entries that may be called by the PK UI. Only valid if pkstate = DEVL.</td>
</tr>
<tr>
<td>pk_applet_loc</td>
<td>19</td>
<td>Yes</td>
<td>Char</td>
<td>URL for metafile.zip file. NOTE: This must be a URL.</td>
</tr>
<tr>
<td>pk_mp_run_parallel</td>
<td>20</td>
<td>Yes</td>
<td>Char</td>
<td>Run MP CONNECT parallel processes? Y / N</td>
</tr>
<tr>
<td>pk_mp_host</td>
<td>21</td>
<td>Yes</td>
<td>Char</td>
<td>Name of SAS Application tier host.</td>
</tr>
<tr>
<td>pk_mp_sascmd</td>
<td>22</td>
<td>Yes</td>
<td>Char</td>
<td>Command to start SAS on the MP host. NOTE: Under Windows, if the SASROOT path contains any spaces, this value must use the DOS-style path name. For example, c:\progra<del>1\sasins</del>1\sas\v8\sas.exe</td>
</tr>
<tr>
<td>pk_mp_number_processors</td>
<td>23</td>
<td>Yes</td>
<td>Num</td>
<td>Number of processors available.</td>
</tr>
<tr>
<td>pk_mp_numjobs_per_processor</td>
<td>24</td>
<td>Yes</td>
<td>Num</td>
<td>Number of jobs allocated to each processor. For example, 2.</td>
</tr>
<tr>
<td>pk_source_db_engine_name</td>
<td>25</td>
<td>No</td>
<td>Char</td>
<td>Name of Source Data Base for PKLoad Environment</td>
</tr>
<tr>
<td>pk_source_db_path</td>
<td>26</td>
<td>No</td>
<td>Char</td>
<td>Source Data Base path info.</td>
</tr>
<tr>
<td>pk_source_db_user</td>
<td>27</td>
<td>No</td>
<td>Char</td>
<td>Source Data Base user ID.</td>
</tr>
<tr>
<td>pk_source_db_pwd</td>
<td>28</td>
<td>No</td>
<td>Char</td>
<td>Source Data Base password.</td>
</tr>
</tbody>
</table>

6. Skip this entire step if you are installing only the SAS Application Tier.

A. If you are installing both the SAS Application and Admin Tiers, execute the SAS System interactively by using a command similar to those shown below. Your SAS working directory will be set automatically by the autoexec.sas program. A successful SAS
System installation and proper execution of this command will result in the SAS Display Manager application running and executing SAS/Warehouse Administrator software.

- On UNIX:
  
  `!SASROOT/sas -autoexec PRI_root_dir_name/autoexec.sas -dms -set pkprofile selected_profile_name &`

- On Windows:
  
  `!SASROOT\sas.exe -autoexec PRI_root_dir_name\autoexec.sas -set pkprofile selected_profile_name`

**Note:** Under Windows, if the `PRI_root_dir_name` path contains any spaces, the value for `PRI_root_dir_name` must use the DOS-style path name (for example, `c:\progra~1\sasins~1\sas\v8\pri`) in the specification of the `-autoexec` option, or if a Shortcut is defined, the option may be omitted, and the Start In: directory set using the DOS-style path name. This is necessary for correct execution of parallel processing during data loading and enrichment activities.

B. If you are installing the Admin Tier only (i.e., installing the SAS Application Tier on one machine and the Admin Tier on another machine), use an operating system command to manually set your current directory to the `PKWarehouse` directory under `PRI_root_dir_name` on the machine where you installed the SAS Application Tier. (`PRI_root_dir_name` is a part of the SAS Application Tier and was defined when the tier was installed.)

Execute the SAS System interactively by using a command similar to those shown below. A successful SAS System installation and proper execution of this command will result in the SAS Display Manager application running and executing SAS/Warehouse Administrator software.

- On UNIX:
  
  `!SASROOT/sas`

- On Windows:
  
  `!SASROOT\sas.exe`

C. If you are installing the SAS Admin Tier only (or did not install this hot fix in Step 1), install SAS/Warehouse Administrator Software Hot Fix 82WH02 from


D. To view the SAS Process Intelligence Information Store metadata, create a Data Warehouse Environment by right-clicking in the SAS/Warehouse Administrator window and choosing Add Item and then Data Warehouse Environment from the popup menus. In the field labeled Path:, Type _master, which defines the path relative to the current directory (a more flexible approach than selecting the fully qualified path name using the selector arrow), and select OK. This results in a screen that
displays an object named Process Intelligence V2.5. Double click on this icon to open the Process Intelligence Information Store.

7. For Windows only:

   Edit the file PRI_root_dir_name/SharedComponents/source/init.sas. Change win in goptions dev=win; to an appropriate device driver.

   For more information, refer to SAS Note SN-005589, “Graphics output missing in ODS PRINTER (PS/PDF) output.”

8. Create as many SAS/IntrNet Application Server services as needed. Use the SAS/IntrNet Configuration Utility to create these SAS/IntrNet Application Server services. Refer to the documentation section “Completing the Installation in the SAS/IntrNet Application Dispatcher” on the SAS Client-Side Components CD for more information. SAS/IntrNet Application Server socket services are generally recommended for use with SAS Process Intelligence.

For Windows Only:

After creating the SAS/IntrNet Application Server services, you must modify each service for SAS Process Intelligence. The root directory of the SAS/IntrNet service will be referred to as PRI_Intrnet_root_dir_name in this section.

A. In the services directory, rename the appstart.sas file to default_appstart.sas. Then, copy the PRI_root_dir_name\Intrnet\win_appstart.sas file to the services directory and rename it PRI_Intrnet_root_dir_name\service_name\appstart.sas.

B. Edit the PRI_Intrnet_root_dir_name\service_name\appstart.sas file and modify the tmplib and logfile to point to valid locations.

C. Modify the appstart.bat file by adding the following parameters to the end of each start command:

   autoexec "PRI_root_dir_name\autoexec.sas"
   -set pkprofile default (or the appropriate pkprofile value you set up in the autoexec data set; if you do not specify a pkprofile, the first row will be used.)

   Once the parameters are added, the line may look like this:

   start/min "SAS/IntrNet" "!SASROOT\sas.exe" ..\appstart.sas
   -log ..\logs\appsrv_5000.log -noterminal -sysparm "port=5000"
   -awstitle "SAS/AppSvr 5000" -autoexec
   "PRI_root_dir_name\autoexec.sas" -set pkprofile profile_name
   -rsasuser

D. If you are setting up the SAS/IntrNet Application Server as a service, modify and resave any SASINET*.INI files. Use the SASINET5XXX.INI file shipped with SAS Process Intelligence and found in its PRI_root_dir_name\Intrnet directory as a
template for your modifications. Ensure that each SAS/IntrNet Application Server service is invoked using the `autoexec.sas` file shipped in the root SAS Process Intelligence installation directory as the value for the `–autoexec` option.

Furthermore, if you wish to install the SAS/IntrNet Application Server services as Windows NT services, you must install the SAS Service Configuration utility as documented in the SAS System Installation Instructions. For more information about using Windows NT services, refer to the section “Using Services” in the SAS/IntrNet Application Dispatcher documentation on the SAS Client-Side Components CD.

For UNIX Only:

A. To create the SAS/IntrNet Application Server `start.pl` script on UNIX, run the command `!SASROOT/utilities/bin/inetcfg.pl`.

B. Enter the root directory of the SAS/IntrNet service (which will be referred to as `PRI_Intrnet_root_dir_name` in this section).

C. Specify that the service type is `1 - Socket Service`.

D. Specify the name of the new service; `default` is the default service name.

E. Enter the number of servers. `1` is the default number.

F. TCP/IP port 5001 is used by default by SAS/IntrNet for SAS Process Intelligence.

G. Enter `N` when asked about protecting the administration of this service with a password.

H. Confirm the service parameters. Enter `Y` if you are satisfied with the parameters.

The SAS/IntrNet Application Server service directory has been created.

I. Replace the `PRI_Intrnet_root_dir_name/service_name/appstart.sas` file with `PRI_root_dir_name/intrnet/unix_appstart.sas`. To replace the file, submit the command:

```
cp PRI_root_dir_name/intrnet/unix_appstart.sas \   PRI_Intrnet_root_dir_name/service_name/appstart.sas
```

J. Edit the `PRI_Intrnet_root_dir_name/service_name/appstart.sas` file and modify the `tmplib` and `logfile` to point to valid locations.

K. Modify the `start.pl` file that was created in the `PRI_Intrnet_root_dir_name/service_name/` directory by adding the following parameters to each exec command:

```
-autoexec 'PRI_root_dir_name/autoexec.sas'
-set pkprofile default
```

(or the appropriate `pkprofile` value you set up in the `autoexec` data set)
Note: The environment variable name pkprofile must be specified in lowercase.

Once the parameters are added, the line should look like this:

```
exec "!SASROOT/sas ../appstart.sas -sysparm 'port=$port'
-noterminal -autoexec 'PRI_root_dir_name/autoexec.sas' -set
pkprofile profile_name -rsasuser -log ../logs/appstart_$port.log
> ../logs/appstart_$port.out 2>&1"
```

For more information about using SAS IntrNet Application Dispatcher services, refer to the section “Using Services” in the SAS/IntrNet Application Dispatcher documentation on the SAS Client-Side Components CD.

### The Middle Tier

After installing the Middle Tier of SAS Process Intelligence, perform the following steps.

1. Verify that the SAS/IntrNet broker.cfg and the broker.exe files are located in your Web server cgi-bin or scripts directory. These files should have been installed to your Web server from the SAS Client-Side Components CD during step 3E in Installation Steps.

Add the SAS/IntrNet Application Server service definitions to the broker.cfg file. Ensure that the HTTP security for the cgi-bin and scripts directory allows ANONYMOUS access.

Note: If you are using Microsoft IIS as the Web server, you may want to change the security for the Default Web Site to use Windows NT Challenge/Response and to not allow Anonymous authentication.

2. Edit the /PRI_midtier_root_dir_name/Config/config.jsp file (See Step 3D under Installation Steps for more information). Ensure that all strings function.

   Note: On UNIX, remove the .exe from broker.exe in the sasBrokerURL string.

The following is an excerpt from the /PRI_midtier_root_dir_name/Config/config.jsp file. The highlighted sections of the excerpt are the contents of the file that need editing.

```java
// Where the SAS/Intrnet service broker resides. (example: YOURSERVER.COMPANY.COM)
static final String sasBrokerHost = " ";

// SAS/Intrnet broker URL on sasBrokerHost (example: /cgi-bin/broker.exe)
static final String sasBrokerURL = " ";

// SAS/Intrnet service to use (example: SRI_service)
static final String sasService = " ";

// SAS program library to use (do not edit default)
static final String sasLibrary = "pkmpgms";
```
// SAS/Intrnet default debugging mode
static final String sasDebug = "0";

// User id to use for SAS if none available from JSP request object
static final String sasAnonymousUser = "UNKNOWN_ANONYMOUS";

// Collaborative Space root location (example: http://COLLABORATIVE_SERVER.COM/PublishedContent)
static final String sGMHome = "";

// What to call the knowledge management tab
static final String sGMName = "Collaborative Space";

// Where to obtain Internet Explorer (example: http://www.microsoft.com/ie)
static final String sDownloadURL = "";

Ensure that the sGMHome will resolve to the Collaborative Space location by testing the URL in a browser.

3. Copy the directory PRI_midtier_root_dir_name/updates/sasapplets that was installed from the SAS Process Intelligence Web Application Components under the Web server document root directory. (For example, under IS, /inetpub/wwroot)

Optional Configuration: Controlling the format for content published to Collaborative Space

By default, content will be published from the Middle Tier to Collaborative Space in Rich Text Format (.rtf). To change this, you will need to edit the following file:
PRI_midtier_root_dir_name/PKD/scripts/output.js

In the function publishContent, the value for the parameter pk_format needs to be modified. Listed below is the source code for this function.

```javascript
/*
 * Publishes content to group memory.
 */
function publishContent( publishCode ) {
    var confirmMessage =
        "A copy of this document will be sent to " + groupMemoryName + ".";

    if ( window.confirm( confirmMessage ) ) {

        return newWindow( document.location.href +
            "&pk_dest=" + publishCode +
            "&pk_css=" + escape( cssURL ) +
            "&pk_format=rtf" );
    }
}
```
To publish in the following supported formats, change the value for pk_format as indicated:

<table>
<thead>
<tr>
<th>Supported Format</th>
<th>pk_format Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTML</td>
<td>html</td>
</tr>
<tr>
<td>PDF</td>
<td>pdf</td>
</tr>
<tr>
<td>RTF (currently the default)</td>
<td>rtf</td>
</tr>
</tbody>
</table>

### The Data Tier

#### Populating the Universal Data Model (UDM) with the Sample Data

1. On the Application Tier machine, execute the SAS System interactively by submitting a command similar to the following:

   - On UNIX:
     ```
     !SASROOT/sas -autoexec PRI_root_dir_name/autoexec.sas -dms
     -set pkprofile selected_profile_name &
     ```

   **Note:** The environment variable name pkprofile must be specified in lower case.

   - On Windows:
     ```
     !SASROOT\sas.exe -autoexec PRI_root_dir_name\autoexec.sas
     -set pkprofile selected_profile_name
     ```

   **Note:** Under Windows, if the PRI_root_dir_name path contains any spaces, the value for PRI_root_dir_name must use the DOS-style path name (for example, c:\progra~1\sasins~1\sas\v8\pri) in the specification of the -autoexec option, or if a Shortcut is defined, the option may be omitted, and the Start In: directory set using the DOS-style path name. This is necessary for correct execution of parallel processing during data loading and enrichment activities.

   A successful SAS System installation and proper execution of this command will result in the SAS Display Manager application running and, if the Admin tier is also installed on this machine, executing SAS/Warehouse Administrator software.

2. From the SAS Program Editor, open the program PRI_root_dir_name\PKWarehouse\jobs\PRI_Initial_Setup.sas and submit it to the SAS compiler by pressing the F3 key or by typing `submit` on the command line. This program sets up empty tables for all the libraries used in the Process Intelligence Solution, and populates all the static tables. Examine the log.

   If you are using SAS as your repository, there should be no errors. If you are using a database as your repository, you may expect to see errors stating that the database tables do not exist when a `DROP TABLE` statement attempts to delete them.
You will also find the message Warning: Program
PRI_root_dir_name/PKWarehouse/model/model_sas_surrogate_keys/foreignkey/
PKUser.sql not found or is not a .sql or .ddl file. This message is expected
and correct.

3. Edit the WA extended attributes of the Create UI Dimension Data Job.

A. Start SAS and open Warehouse Administrator.

B. Open the Process Editor by choosing Tools and Process Editor.

C. Open the job group names summary jobs. Highlight the job named Create UI
Dimension Data Job.

D. Right-click and choose Properties and then choose File and Extensions to view the
extended attributes associated with the job.

E. Choose each of the three attributes and select the modify button to edit the values of the
attributes. These attributes must match the URL, User ID and PW associated with the
Webdav server that points to the root of the PRI Web Application.

F. Click OK twice to return to the Process Editor.

G. Click the Run button, then select External File and Save. This generates the code
associated with the changes just made in the extended attributes.

H. Verify that the generated code matches the changes that were made.

I. Navigate the file system and replace the job named CreateUIDimensionData.sas located
in !SASROOT/pri/PKWarehouse/jobs.

4. From the SAS Program Editor, open the program
PRI_root_dir_name/PKWarehouse/jobs/PRI_Initial_Data_Load.sas.

If DB2 is not the data repository, submit the program “as is” to the SAS compiler by pressing the
F3 key or by typing submit on the command line.

Note: The use of DB2 as the data repository is Experimental in PRI V2.5. An intermittent
problem has been reported in PRI_Initial_Data_Load.sas and
PRI_Incremental_Data_Load.sas. The problem results in an access violation during
the execution of the last step of these two programs. To avoid this error, take the following
precaution:

A. Edit the data load programs and remove lines 142-145:

/* Load UI tables */
%put NOTE: Running: CreateUIDimensionData.sas;
%include "&PKWarehouse/jobs/CreateUIDimensionData.sas";

B. Submit the data load program.
C. Exit SAS.

D. Start SAS up again.

E. Open and submit PKWarehouse/jobs/CreateUIDimensionData.sas.

This program performs the following tasks:

- Load the Initial detail-level categorical and continuous data from the Intermediate Data Format (IDF) into the Universal Data Model (UDM).
- Summarize the detail-level data to provide subgroup1 and subgroup2-level data.
- Run the SAS Process Intelligence Agent in Initialize mode for operation=300, for both process and product monitoring.
- Load all tables that dynamically drive the Process Intelligence Discoverer.

Examine the log. There should be no errors. There will be several types of WARNINGS which are expected.

- The sample data contains the same data for the dimensions in both the categorical and continuous IDFs. Therefore, duplicate values are detected while the categorical data is being loaded. The integrity constraints prevent these duplicates from being added to the dimension tables of the UDM, and produce messages such as these:

  - WARNING: Add/Update failed for data set UDM.EQUIPMENT_BUSINESS because data value(s) do not comply with integrity constraint XPKequipment_business. (Occurred 4 times.)

  - WARNING: Duplicate values not allowed on index location name for file LOCATION_BUSINESS. (Occurred 5 times.) The exact text of the message will vary depending on your repository.

  - A related message states WARNING: APPEND step return code _RCEQUIPMENT_BUSINESS=4 . which is a warning-level return code, resulting from the rejected duplicate records.

- The warning WARNING: The PKMACROS.SASMACR catalog is opened for read only. will appear at the beginning of each parallel process initiated during the data summarization and the Agent runs.

- During the data summarization processing, several occurrences of this pair of warnings will be seen:

  - WARNING 32-169: The quoted string currently being processed has become more than 262 characters long. You may have unbalanced quotation marks.

  - WARNING: NOTE - This warning concerning the string becoming more than 262 characters should be ignored.
• Also occurring in the data summarization processing is\n  WARNING: Variable productkey already exists on file\n  TARGET.PROCESS_SUBGROUP2_CONTINUOUS.

• During the Agent processing, this message appears: WARNING: Variable SK_data_range_point was not found on DATA file.

• As the Agent parallel processes are being prepared for the sample data, this message is generated:
  ▪ WARNING: The number of jobs requested (2) exceeds the number of process_id values available.
  ▪ WARNING: Only 1 jobs will be generated.

5. Next, from the SAS Program Editor, open the program\nPRI_root_dir_name/PKWarehouse/jobs/PRI_Incremental_Data_Load.sas. This\nprogram will be run three times, first unmodified (pointing to the Enrich1 subdirectory in the\nlibname statement on line 94), and then after modifying line 94 to point to the Enrich2\nsubdirectory, and then the Enrich3 subdirectory. This program performs the following tasks:

• Load incremental detail-level categorical and continuous data from the Intermediate Data\n  Format (IDF) into the Universal Data Model (UDM).

• Summarize the detail-level data to provide subgroup1 and subgroup2-level data.

• Run the Process Intelligence Agent in Enrich mode for operation=300, for both process\n  and product monitoring.

• Update all tables that dynamically drive the Process Intelligence Discoverer.

After each run, examine the log. There should be no errors. The same warnings described in the\nprevious section will occur when running the PRI_Incremental_Data_Load.sas program.

In addition, these expected warnings will also appear several times:

• WARNING: No output destinations active.

• WARNING: Specifying CLIPSYMBOL= is recommended when CLIPFACTOR= is used.

• WARNING: There is insufficient space to draw the upper control limit label for the secondary chart without overwriting the lower control limit label for the primary chart.

Test the installation of SAS Process Intelligence as documented in the next section.
Completing and Testing the Installation

To test the installation of SAS Process Intelligence, perform these final steps:

1. (Re)start your JSP/Servlet container, your Web server, and your SAS/IntrNet Application Server service.

2. Test your installation by pointing Internet Explorer to http://web_server/PRI/Util/installConfirm.jsp, replacing web_server with the host name of your Web server. You should see a window similar to the following:

   Values defined in config.jsp

   SAS/Intrnet service broker (SAS broker host): <your Middle Tier>
   SAS/Intrnet broker URL on the SAS broker host: /scripts/broker.exe
   SAS program library to use: pkmpgms
   SAS/Intrnet default debugging mode: 0
   Default user id for SAS: unknown\anonymous
   Collaborative Space location: http://<your Middle Tier>/webdav_test
   Microsoft Internet Explorer download location:

   Use the following links to confirm the proper deployment of config.jsp

   1. Use this link to confirm the connection to the SAS/Intrnet broker location:
      http://<your Middle Tier>/scripts/broker.exe
   2. Use this link to confirm the connection to SAS/Intrnet:
      http://<your Middle Tier>/scripts/broker.exe?_service=PRI_2_5&_program=ping
   3. Use this link to confirm the connection to the Collaborative Space location:
      http://<your Middle Tier>/webdav_test

   Use the following link to confirm the proper deployment of server side components

   1. Use this link to confirm server side components:
      http://<your Middle Tier>/scripts/broker.exe?_service=PRI_2_5&_program=pkmpgms.webhello.sas

3. Verify the information you entered in PRI_midtier_root_dir_name/Config/config.jsp. by reviewing the information displayed in the top section of the window.

4. Navigate to the first three links shown in the window to verify that your SAS/IntrNet services and your WEBDav server are running.

5. Navigate to the last link shown in the window to verify that the server side components are set up correctly. Confirm that the following tables exist.

   Note: This list offers a sample of the tables that will appear. It is not an exhaustive list.
<table>
<thead>
<tr>
<th>Library</th>
<th>Table</th>
<th>Exist with Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKMeta</td>
<td>AGENT_CLASS_METADATA</td>
<td>YES</td>
</tr>
<tr>
<td>PKMeta</td>
<td>ATTRIBUTE_METADATA</td>
<td>YES</td>
</tr>
<tr>
<td>PKMeta</td>
<td>CLASS_METADATA</td>
<td>YES</td>
</tr>
<tr>
<td>PKMeta</td>
<td>DETAIL_HIERARCHY_METADATA</td>
<td>YES</td>
</tr>
<tr>
<td>PKMeta</td>
<td>DIMENSION_KEY_METADATA</td>
<td>YES</td>
</tr>
<tr>
<td>PKMeta</td>
<td>DIMENSION_METADATA</td>
<td>YES</td>
</tr>
<tr>
<td>PKMeta</td>
<td>DIS_TASK_DATADEF</td>
<td>YES</td>
</tr>
<tr>
<td>PKMeta</td>
<td>OUTPUT_STYLE</td>
<td>YES</td>
</tr>
<tr>
<td>PKAgent</td>
<td>ANALYTICS_STATUS</td>
<td>YES</td>
</tr>
<tr>
<td>PKAgent</td>
<td>EXCEED_LIMIT_TYPE</td>
<td>YES</td>
</tr>
<tr>
<td>PKAgent</td>
<td>SMALL_N_METHOD</td>
<td>YES</td>
</tr>
<tr>
<td>PKAgent</td>
<td>SPEC_LIMITS_ESTIMATED_TYPE</td>
<td>YES</td>
</tr>
<tr>
<td>PKUser</td>
<td>USER_METADATA</td>
<td>NO</td>
</tr>
<tr>
<td>PKUser</td>
<td>USER_METADATA_DETAIL</td>
<td>NO</td>
</tr>
<tr>
<td>PKUser</td>
<td>USER_METADATA_PHYSFILE</td>
<td>NO</td>
</tr>
</tbody>
</table>

If any of the tables mentioned above were not created, or were created without observations, there was an error in loading the data.

6. If you successfully verified the installation, bring up the solution by pointing Internet Explorer to http://web_server/PRI/index.jsp, replacing web_server with the host name of your Web server.

The SAS Process Intelligence application begins. Here is an example of the SAS Process Intelligence window:
Please refer to the *SAS Process Intelligence User’s Guide* for information needed after the installation of SAS Process Intelligence.
Appendix S, Post-Installation Setup for Risk Dimensions™ Software

Starting the Risk Dimensions Application

A UNIX script file called sasrisk is located in your SASROOT directory. Append your SASROOT directory name to your system PATH environment variable, and use sasrisk to start up the Risk Dimensions software.
Appendix T, Post-Installation Setup for SAS/SECURE™ Software

SAS/SECURE software includes client components that you can use to create non-SAS System client applications that communicate with a SAS server in a secure environment. To use encryption between a non-SAS System client and a SAS Server with SAS/SECURE software licensed, you must install the SAS/SECURE client components on the client machine.

SAS/SECURE Client for Windows

The secwin.exe executable installs the files necessary for the IOM Bridge for COM to use the CryptoAPI algorithms. It also contains a TAR and ZIP file that is used to develop Java clients that utilize the encryption support.

SAS/SECURE Client for Java

The SAS/SECURE client for Java provides encryption support for Java applications. You can incorporate this support into applications that are written using the following components:

- SAS/SHARE driver for JDBC
- SAS/CONNECT driver for Java
- IOM Bridge for Java

Client-Side Components CD

The SAS/SECURE client components are available on the SAS Client-Side Components CD included with your SAS Software distribution.
Appendix U, Post-Installation Setup for SAS/SHARE® Software

User Authorization

You are required to complete the steps from the section “Configuring User Authorization” on page 20 in Chapter 3, “Post-Installation Instructions.” This allows SAS/CONNECT, SAS/SHARE, and SAS Integration Technologies software to authenticate a client’s identity and check a client’s authority to access resources. Using SAS Setup, follow these steps:

System Configuration for the TCP/IP Communications Method

The SAS system option `COMAMID=` specifies which access method SAS/SHARE software should use for communication. You must specify `COMAMID=TCP` to use the TCP/IP access method, which is the only access method available for use with this release of SAS/SHARE servers running under UNIX.

Each SAS/SHARE server that runs on a network node must be defined as a service in the file `/etc/services` or `/etc/inet/services` on that node. Each entry in this file associates a service name with the port number and protocol used by that service. An entry for a SAS/SHARE server has the following form:

```
<server name>  <port number>/tcp  # <comments>
```

The server name must be 1-8 characters in length. The first character must be a letter or underscore; the remaining seven characters can include letters, digits, underscores, the dollar ($) sign, or the at (@) sign.

An entry for a server whose name is MKTSERV might look like the following:

```
mktserv  5000/tcp   # SAS/SHARE server for Marketing and Sales
```

The server name is specified with the `SERVER=` option in the LIBNAME statement, and the OPERATE procedure in user and server administrator programs.

System Configuration for the APPC Communications Access Method

See “System Configuration for the APPC Communications Access Method,” on page 52 in the appendix “Post-Installation Setup for SAS/CONNECT Software,” for information on establishing an environment to use SNA LU6.2 APPC (Advanced Program-to-Program Communications) within your SAS applications under HP-UX and AIX.

**Note:** Currently, only a client-side implementation is available for use with either SAS/CONNECT or SAS/SHARE software. The SAS/SHARE server cannot be
configured to run on a UNIX Operating System using the APPC Communications Access Method.

Client-Side Components

SAS/SHARE software includes client components that are used outside of your SAS installation. These components are described below:

**SAS/SHARE Data Provider**

The SAS/SHARE data provider enables you to access, update, and manipulate SAS data using OLE DB- and ADO-compliant applications on Windows platforms.

**SAS ODBC Driver**

The SAS ODBC driver enables you to access, update, and manipulate SAS data from ODBC-compliant applications on Windows platforms.

**SAS/SHARE Driver for JDBC**

The SAS/SHARE driver for JDBC enables you to write applets, applications, and servlets that access and update SAS data. The Java Tools package that includes the SAS/SHARE driver for JDBC also includes the SAS/CONNECT driver for Java. If you are writing Java programs using these interfaces, you may also want to use the tunnel feature. This optional feature can be used with the Java applets you write to solve some common configuration problems.

**SAS/SHARE SQL Library for C**

The SAS SQL Library for C provides an application programming interface (API) that enables your applications to send SQL queries and statements through a SAS/SHARE server to data on remote hosts.

SAS/SHARE client components are delivered with SAS/SHARE Software and may be found in the `!SASROOT/misc/share` directory. See the `readme.txt` file in this directory for a description of each component file. SAS/SHARE client components are also available on the SAS Client-Side Components CD included with your SAS Software distribution.
Appendix V, Post-installation Set-up for SAS® Value Chain Analytics Server Software

After you have installed the SAS System and applied your setinit, follow these steps to complete the configuration necessary to use SAS Value Chain Analytics software:

1. Create the SAS VCA catalog
   a. Create a SAS dataset in SASHelp directory named VCA_Catalog. The SASHelp directory is named SASCFG under the root SAS/BASE installation. The table must have the following fields:
      - ID num
      - ProjectName char(50)
      - Path char(255)
      - Type num
      - Data char(1024)
   b. Add the following rows to the table. Substitute the correct installed location for all of the paths in the table.

<table>
<thead>
<tr>
<th>ID</th>
<th>ProjectName</th>
<th>Path</th>
<th>Type</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>UserFolder</td>
<td>&lt;installdir&gt;/vca/data</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>ScriptFolder</td>
<td>&lt;installdir&gt;/vca/calcengine</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>NewTemplate</td>
<td>&lt;installdir&gt;/vca/newtemplate</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>LanguageFolder</td>
<td>&lt;installdir&gt;/vca/calcengine/resources</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Reporting</td>
<td>&lt;installdir&gt;/vca/reporting</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

2. Give full control permission to the following folders for each user:
   - the user’s directory
   - the user’s temporary files directory
   - the installation location of SAS/BASE and its subdirectories
   - the VCA model folder location
Appendix W, Post-Installation Setup for WebHound

WebHound Functionality

WebHound turns Web traffic data into information, and enables you to optimize your e-business investment. WebHound captures information about Web traffic, summarizes the information for detailed and historical analyses, and defines that information to your data warehouse.

In addition, WebHound provides standard reports, both static and dynamic, and allows customized reports and queries to be built. Presentation is in graphical or tabular form, and is presented through your Web browser.

WebHound can transform the largest Web system and the most complex Web logs into a fully functioning data warehouse, giving you the ability to combine this data with other customer data. WebHound allows you to discover information about your customers and to personalize your processes to increase sales.

If your site is authorized for WebHound software and the installation instructions for SAS software detailed earlier in this document have been followed, then your WebHound software has been installed in the !SASROOT/ folder. The following sections describe WebHound’s configuration.

Configuring WebHound

Complete the following steps to configure your WebHound software:

1. Bring up SAS and enter webhound on the SAS command bar. This will bring up the Administrator GUI wizard.

2. Enter the name, the description and the directory for your WebHound environment, and the location of your Web log data.

3. To process Web log data, enter the following macro commands from your program editor window:

   %WebHound(data_store=<WebHound_environment_directory>, program=extract);
   %WebHound(data_store=<WebHound_environment_directory>, program=load);
   %WebHound(data_store=<WebHound_environment_directory>, program=report);

   where <WebHound_environment_directory> is the directory of your WebHound environment where you defined using the Administrator GUI wizard.

4. To set up and configure the software needed to view drillable reports, follow the instructions in Appendix 1 of the WebHound Administrator’s Guide, Version 4. This Post-
Installation Instructions appendix can be found at
Appendix X, Using Host Sort Routines

This appendix provides instructions for making host sort routines available to the SAS System. Supported host sort routines are SyncSort and CoSORT. To use host sort routines with the SAS System, complete the following steps:

1. Install the host sort library on your system by following the instructions provided by the vendor. Ensure that the host sort routine works outside of the SAS System.

2. Make the host sort library available to the SAS System by following the instructions in the following section, “Making Host Sort Routines Available.”

3. Submit an options statement in a SAS session to specify the host sort routine by following the instructions in the section “Using Host Sort Routines in a SAS Session.”

Making Host Sort Routines Available

This section describes the system-specific instructions for making host sort routines available to the SAS System.

For AIX

Use either of the following two methods:

Create symbolic links to the host sort libraries from one of the directories searched by default, such as /usr/lib, as shown in the following example for SyncSort:

```
ln -s /usr/local/syncsort/lib/libsyncsort.a /usr/lib
```

or

Set the environment variable $LIBPATH to the directory containing the host sort library, as shown in the following example for SyncSort:

```
LIBPATH=/usr/local/syncsort/lib:$LIBPATH
export LIBPATH
```

Note: If you are running SAS programs through a batch facility, make sure the environment variables described below are set correctly.
Using C Shell

```bash
setenv LIBPATH /usr/local/syncsort/lib:$LIBPATH
```

For ABI+ for Intel® Architecture, Compaq Tru64 UNIX, IRIX, and Solaris

Use either of the following two methods:

Create symbolic links to the host sort libraries from one of the directories searched by default, such as `/usr/lib` as shown in the following example for CoSORT:

```bash
ln -s /usr/local/cosort/lib/libsyncsort.so /usr/lib
```

or

Set the environment variable `$LD_LIBRARY_PATH` to the directory containing the host sort library as shown in the following example for CoSORT:

**Note:** If you are running SAS programs through a batch facility, make sure the environment variables described below are set correctly.

Using Bourne Shell

```bash
LD_LIBRARY_PATH=/usr/local/cosort/lib:$LD_LIBRARY_PATH
export LD_LIBRARY_PATH
```

Using C Shell

```bash
setenv LD_LIBRARY_PATH /usr/local/cosort/lib:$LD_LIBRARY_PATH
```

For HP-UX

Use either of the following two methods:

Create symbolic links to the host sort libraries from one of the directories searched by default, such as `/usr/lib`, as shown in the following example for SyncSort:

```bash
ln -s /usr/local/syncsort/lib/libsyncsort.sl /usr/lib
ln -s /usr/local/syncsort/lib/libmfsyncsort.sl /usr/lib
```

or

Set the environment variable `$SHLIB_PATH` to the directory containing the host sort library as shown in the following example for SyncSort:

**Note:** If you are running SAS programs through a batch facility, make sure the environment variables described below are set correctly.
Using Bourne Shell

```
SHLIB_PATH=/usr/local/syncsort/lib:$SHLIB_PATH
export SHLIB_PATH
```

Using C Shell

```
setenv SHLIB_PATH /usr/local/syncsort/lib:$SHLIB_PATH
```

Using Host Sort Routines in a SAS Session

**Note:** The options statements throughout this section specify the syntax to submit to the SAS System. You can also specify these options as command line options and options in the `sasv8.cfg` file. Refer to *SAS Companion for UNIX Environments:* for more information on setting options.

Use the `SORTNAME` option to tell the SAS System which host sort routine should be used. Submit one of the following options statements in a SAS session:

- To use SyncSort (the default):
  ```
  OPTIONS SORTNAME=SYNCSORT;
  ```

- To use CoSORT:
  ```
  OPTIONS SORTNAME=COSORT;
  ```

Once the host sort routine is available, use the `SORTPGM=HOST` or `SORTPGM=BEST` options statements to tell the SAS System when to use the host sort routine.

Submit one of the following options statements in a SAS session:

- OPTIONS SORTPGM=HOST;

  tells the SAS System to always use the host sort routine made available.

- OPTIONS SORTPGM=BEST;

  tells the SAS System to choose the best sorting method in a given situation, the SAS System sort or the host sort.

There are two options that define how the SAS System chooses the “best” sort algorithm. The following examples use the syntax of an options statement that needs to be submitted to the SAS System:

- `-sortcut <n>`, where `n` specifies a number of observations.

  ```
  OPTIONS SORTPGM=BEST SORTCUT=500;
  ```
-sortcut tells the SAS System to choose the host sort routine if the number of observations is greater than the number you specify, and to use the SAS System sort if the number of observations is equal to or less than the number specified.

- sortcutp <size>[kKmM], where <size> specifies a file size in either kilobytes or megabytes.

```
OPTIONS SORTPGM=BEST SORTCUTP=40M;
```

- sortcutp tells the SAS System to choose the host sort routine if the size of the data being sorted exceeds the size you specify, and to use the SAS System sort if the size of the data is equal to or smaller than the size you specify.

If these options are not defined or these options are set to zero, the SAS System chooses the SAS System sort routine. If you specify both options and either condition is met, the SAS System chooses the host sort routine.

You can change the work directory used for temporary sort files by using the option sortdev <dir>, where <dir> is the directory in which you want the temporary files to be created. For example, submit the following statement if you want the temporary files to be created in /tmp:

```
OPTIONS SORTPGM=BEST SORTCUT=500 sortdev="/tmp";
```

You can specify the host sort option sortanom t to print timing and resource information to the SAS log after each phase of a sort. The following is an example of this option:

```
OPTIONS SORTPGM=HOST SORTANOM=t;
```

You can specify the host sort option sortanom v to print to the SAS log the arguments passed to the sort, which may be useful for tuning or debugging:

```
OPTIONS SORTPGM=HOST SORTANOM=v;
```

You can attempt to increase your sort performance by increasing the values of the sortsiz e and memsize SAS options. However, make sure that sortsiz e is at least 4M less than memsize.

You can see other SAS performance statistics in the SAS log using the FULLSTIMER option:

```
OPTIONS FULLSTIMER;
```
U.S. Government Rights Notice

If you are a United States government site or a U.S. government prime contractor site, information specific to your site is extracted during the product installation phase of the installation procedure and put into the !SASROOT/misc/notice file.

It is important that you read this file, and that you make other users at your site aware of this information. To have the U.S. government notice automatically display in the SAS log, issue the following UNIX command:

    cat !SASROOT/misc/notice >> !SASROOT/misc/base/news

This will append the government notice file onto the existing news file. The default configuration file uses the -news option to specify that this file is displayed in the log after each invocation of the SAS System.