

Installation Instructions for SAS[®] 9.1.3 Foundation for UNIX[®] Environments



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Installation Instructions for SAS® 9.1.3 Foundation for UNIX® Environments

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Chapter 1 – Before You Install SAS 9.1.3 Foundation

Audience

This document is intended for the SAS Installation Representative, designated as the person responsible for installing and maintaining SAS software for UNIX systems at your site.

This document describes the installation instructions for SAS 9.1.3 Foundation, which is made up of server-side Base SAS and a variety of server-side SAS products (the exact products vary by order). Installation of mid-tier and client-side products is available from your SAS Software Navigator.

There are two paths for installing SAS 9.1.3 Foundation, either a new installation or as an upgrade from a SAS 9.1 or SAS 9.1.2 Foundation installation. If you are performing a new installation, go to Chapter 2 after finishing this first overview chapter. If you are performing an upgrade, you should go to Chapter 4 next.

Throughout this document, the installation program for SAS 9.1.3 Foundation is referred to as SAS Setup.

Understanding This Book

This document conforms to the following conventions:

Courier	Courier type indicates commands, directory paths, file names, menu items, Internet addresses, etc.
<i>Italics</i>	Italic type indicates documentation references or key notes.
Bold	Bold type indicates important text or concepts.
UPPERCASE	Uppercase type indicates variable and option settings.
Dollar sign \$ Pound sign #	A dollar sign \$ or pound sign # at the beginning of an example indicates a sample UNIX command line.

Contacting SAS

If you need to contact SAS, refer to the *SAS Technical Support Information* document for information about who to contact and how to contact them. The document may be located by opening the **Documentation for Installing and Configuring SAS** CD or Install Center. On the first page, select **SAS Basic Installation Edition Kit**, then select **SAS Technical Support Information** in the “Service and Support” section.

Accessing Release Documentation

Release documentation is included on the **Documentation for Installing and Configuring SAS** CD, consisting of Alert Notes, System Requirements, Installation Instructions and Configuration Guide. The latest versions of these enclosures are available on the Install Center Web page, <http://support.sas.com/documentation/installcenter/913/kit/index.html>.

To see the documentation included in your installation kit, visit the Install Center Web site and click **Basic Installation Edition Kit** under “SAS 9.1.3.”

Installation Checklist

A typical SAS 9.1.3 Foundation installation involves the following steps. These steps are explained in detail in the remainder of this document. Please use a copy of this checklist as you complete all the steps listed to install SAS 9.1.3 Foundation.

Note: *Most of the steps below are used both for a new installation and for an upgrade.*

Prerequisites

- Make sure the system on which you intend to install SAS 9.1.3 Foundation is properly backed up.

Environment

- Review the *Alert Notes* to learn of any installation-related issues you should be aware of.
- Review the *System Requirements*. Verify that your system meets the minimum operating system version, memory, and disk space requirements.
- You will need approximately 30 MB of free space in `/tmp` for this install.
- Create the *sas* account and ensure you have appropriate permissions and privileges to install SAS 9.1.3 Foundation. Make sure you can mount and unmount CD media on your system.
- Make sure you have adequate free disk space to complete the installation. Refer to the *System Requirements* to determine disk space requirements.

Installation

- Review these *Installation Instructions*.
- Determine the type of installation you will perform.
- If you are performing a new installation, identify a target directory where you want to install SAS 9.1.3 Foundation. Make sure you have write access to the target directory.
- Obtain your SAS Installation Data.

Post-Installation

- Review your installation log files.
- Make SAS 9.1.3 Foundation available for use.
- Make sure you have a Web browser available on your system. Refer to the *System Requirements* to determine Web browser requirements.

Chapter 2 – Installing SAS 9.1.3 Foundation from the SAS Software Navigator

This chapter describes the pre-installation and installation steps necessary for SAS Setup to install SAS 9.1.3 Foundation. For instructions on using the SAS Software Navigator, refer to the *User's Guide for SAS Software Navigator* on the **Documentation for Installing and Configuring SAS** CD or Install Center.

You also have the option to run SAS Setup directly from the SAS Setup Disk.

If you choose this option, refer to "Chapter 3 - Installing SAS 9.1.3 Foundation from the SAS Setup Disk" for directions on how to proceed.

Step 1 – Installation Requirements

All that is required to complete your installation is the proper CD Set to install from and your SAS Installation Data.

CD Set

The CD Set refers to the set of CDs that make up your software order. It is found in the Installation Kit. A CD Set value is printed on the **SAS Setup Disk**, along with the date it was manufactured, to assist you in locating the correct set of CDs to complete your installation. The CD Set for SAS 9.1.3 Foundation consists of the following:

- **SAS Software Navigator**
- **SAS Setup Disk**
- Software Disks (one or more numerically labeled, such as **Software Disk 1**)

When installing SAS 9.1.3, you should begin with the SAS Software Navigator (either from the **SAS Software Navigator** CD or from a SAS Software Depot), and you will be prompted for any additional CDs required. Based on your software selections, you may not be prompted for all the CDs you received in your Installation Kit.

SAS Installation Data

SAS Installation Data (SID) consists of customized installation information and customized product authorization information provided by SAS. The SID is obtained by the SAS Software Navigator and passed to the SAS 9.1.3 Foundation install.

Step 2 – Verifying Your Environment

Alert Notes

Alert Notes list any installation-related issues you should be aware of before installing or using SAS software. Review the *Alert Notes* in your Installation Kit and familiarize yourself with any issues before installing or using SAS software.

Product-specific Alert Notes are not included in your Installation Kit. You can access product-specific Alert Notes from the following Web site:

http://support.sas.com/techsup/search/alert_search.html

System Requirements

SAS 9.1.3 Foundation supports specific releases and versions of various UNIX operating systems. Review the *System Requirements* in your Installation Kit and verify that your system meets the minimum operating system, memory, and disk space requirements before you begin installing SAS 9.1.3 Foundation. Installation of SAS 9.1.3 Foundation will not be successful if the minimum system requirements have not been met.

Temporary Space

SAS Setup uses up to 30 MB of temporary disk space in your `/tmp` directory to load its installation programs. After the installation is complete, this disk space is freed.

If there is not enough space in `/tmp`, the install will prompt you for an alternate location to be used to load the installation programs. When this situation occurs, the alternate location becomes the default target directory in which to install SAS 9.1.3 Foundation. Therefore, you need to make sure that you specify an alternate location with adequate space for your entire installation, not just the installation programs.

You can check the available disk space in the `/tmp` directory using a command similar to the following:

```
$ df -k /tmp
```

Accounts and Permissions

SAS highly recommends that you perform all of your installs using the *sas* account. While this can be any user id, we recommend you choose an account such as *sas* or *sassys*. Once chosen, this user id is referred to as the *sas* account. Doing so allows consistent ownership and file permissions to be maintained. For more information about the *sas* account, refer to the *SAS Intelligence Platform: Installation Guide*, located at <http://support.sas.com/documentation/configuration/913admin.html>.

Installing SAS 9.1.3 Foundation on UNIX requires that you have appropriate permission to access CDs or network-mounted files and have write access to your intended target directory.

The following steps will require use of the *root* account during a SAS 9.1.3 Foundation install.

- If you are not using an automount program, you must be *root* to mount and unmount CDs. This means you must mount and unmount CDs from a separate process or sub-process. You will not be prompted to mount CDs when you install from a SAS Software Depot.
- You must perform the Configure User Authentication step to change the `setuid` permissions of certain files to *root* during the post-processing stage of the install. See “Configuring User Authentication” in Chapter 2 below and also “Configuring User Authentication” in Chapter 4 for more details.

Adequate Free Disk Space

1. Make sure you have adequate free disk space in the `/tmp` directory to load the install properly.
 - You will need approximately 30 MB of free space in `/tmp`.
 - This space is freed upon completion of the install.
2. Make sure you have enough free space in the target directory to install all the software for which you are licensed.
 - You can approximate the amount of disk space you will need by comparing the list of licensed software on the *SAS Order Information* document with the *System Requirements* document.

If you need to contact SAS for help in finding any of this information, refer to the *SAS Technical Support Information* document for information about who to contact and how to contact them. The document may be located by opening the **Documentation for Installing and Configuring SAS** CD or Install Center. On the first page, select **SAS Basic Installation Edition Kit**, then select **SAS Technical Support Information** in the “Service and Support” section.

Step 3 – Preparing for Installation

In preparation for your installation, you need to consider the following issues so you can provide appropriate responses to SAS Setup prompts. You need to determine all of the following information prior to running SAS Setup.

Installation Type

Determine the type of installation you will perform – create a new installation or update an existing installation.

New installation	This creates a new, independent installation of SAS 9.1.3 Foundation. This new install may also be used as a step in upgrading to SAS 9.1.3 Foundation.
Existing installation	This updates an existing installation of SAS Foundation. Choose this type when you want to upgrade your installation to 9.1.3 or add products to your existing 9.1.3 installation. Updating an existing installation requires that you specify the SASROOT directory of that existing installation. Upgrading to SAS 9.1.3 Foundation from any release of SAS earlier than 9.1 is not valid.

Target Directory

Determine the target directory in which you intend to install SAS 9.1.3 Foundation. Make sure you have write access to this target directory. The target directory of your SAS 9.1.3 installation will be referred to as SASROOT. In the examples in this manual, `/usr/local/SAS/SAS_9.1` has been used for the SASROOT directory.

New installation	A new installation not being used as a step in an upgrade requires an empty directory location in which to install SAS 9.1.3 Foundation.
Existing installation	You must specify the directory of an existing installation. Determine the full directory path of your existing SAS Foundation installation.

If the target directory is NFS-mounted from a remote machine, `root` may not have write access due to an NFS security feature that disallows root write access to NFS-mounted directories by default. You

can either install SAS with an account other than *root*, or you can grant *root* permission to write to the directory.

To grant *root* write access to an NFS-mounted directory, the export permissions for that directory will need to be modified on the remote machine. To modify the export permissions, see the man page for “exports” on the remote machine. For most UNIX platforms, modifying the permissions involves making revisions to the `/etc/exports` file, and then executing `exportfs -a` or sending a HUP signal to the `mountd` process for the changes to take effect. Remounting the directory will usually not be necessary.

Java Runtime Environment

Some features in SAS 9.1.3 require the use of a SAS-specific version of the Java Runtime Environment (JRE) which is included in a SAS 9.1.3 Foundation installation.

If you are performing a new installation and SAS 9.1.3 Foundation has previously been installed on this computer, you need to determine whether or not the new SAS installation should contain its own copy of the JRE.

At the time of the previous installation, SAS Setup created a `.sasprefs` file in the home directory of the user performing the install. Data in this file specifies the location of the installed JRE. The new installation will use the JRE pointed to by the `.sasprefs` file by default, assuming the `.sasprefs` file exists. If you choose to share the previously installed JRE with the new installation, the original JRE installation pointed to by the `.sasprefs` file must not be deleted or the new installation of SAS will no longer work.

If you prefer that your new SAS installation contain its own copy of the JRE to avoid concerns about keeping the previous installation, you should rename or delete the pre-existing `.sasprefs` file prior to performing your new SAS installation.

Step 4 - Running SAS Setup

When the SAS Software Navigator reaches SAS 9.1.3 Foundation in its installation queue, you will be prompted to find and mount a CD. If you are beginning an installation, locate the CD labeled **SAS Setup Disk** in your Installation Kit. Otherwise, locate the CD that SAS Setup has prompted you to mount.

Note: If you are using a SAS Software Depot, you will receive no media prompts, and the install will launch automatically.

Step 5 - Prompting Phase

The prompting phase presents a series of menus and prompts to gather all the necessary information to complete the installation.

Conventions

The first screen you see when you run SAS Setup is the Welcome screen. It lists the conventions used in the installation program.

```

SAS Installation Setup

Welcome to SAS Setup, the program used to install and maintain your
SAS software. SAS Setup guides you through a series of menus and prompts
to gather the information it requires to complete its tasks.

Some conventions used throughout SAS Setup are:
  * indicates which menu selection is the default choice
  ( ) indicates the default response to a prompt
  ! starts a sub-shell on your system
  h displays help for a menu selection or prompt
  g goes back to a previous menu selection or prompt
  q quits SAS Setup at any point

SAS Setup is fully documented in the installation instructions included
in your Installation Kit.

Press <Enter> to continue...

```

SAS Setup Help

Within SAS Setup, at most prompts and menus, context-sensitive help is available by responding with help (or just 'h'). In addition, for menus, you can enter help or 'h' followed by the number of a menu entry, to get information on just that one menu entry.

Primary Menu Options

Depending on where you launched SAS Setup from, you have the choice of performing a new installation, updating an existing installation, or running setup utilities to maintain an existing installation.

If you launched SAS Setup from the *SAS Setup Disk*, you will see the following choices in the SAS Setup Primary Menu:

```

Primary Menu
-----
  1. Perform a New Installation
  2. Update an Existing Installation
-----
g: Go back  q: Quit    h: Help
-----

```

If you launched SAS Setup from the SASROOT directory, you will see the following choices in the SAS Setup Primary menu:

```
Primary Menu
-----
 1. Update an Existing Installation
 2. Run Setup Utilities
-----
g: Go back   q: Quit   h: Help
-----
```

Perform a New Installation

A new installation is the recommended option for installing SAS 9.1.3 Foundation, either as a clean install or as a step in upgrading to SAS 9.1.3 Foundation. You can have as many SAS 9.1.3 Foundation installations on a system as you like. Upgrading to SAS 9.1.3 Foundation from any release of SAS earlier than 9.1 is not valid.

Update an Existing Installation

This option is typically chosen when adding software to an existing SAS 9.1.3 Foundation installation. Updating an existing installation requires that you specify the SASROOT directory of that existing installation.

Run Setup Utilities

Running Setup Utilities allows you to perform maintenance tasks to an existing installation of SAS 9.1.3 Foundation, such as renewing your license information.

Target Directory

The target directory location is where you want to install or have previously installed SAS 9.1.3 Foundation. This location is also referred to as SASROOT. Make a note of the full directory path of your target directory so you can provide the information when prompted.

```
Specify Target Directory

Please enter the full directory path of the target location for the
installation of SAS. The directory you specify must be the root
directory of an existing SAS installation of the same release.

Target location path? [/usr/local/SAS/SAS_9.1]
-->
```

Make sure there is adequate free disk space available in the target directory. You can estimate the disk space requirements from the “Space Requirements” section listed in the *System Requirements*.

Loading Options

If you are performing an install from your SAS Software Navigator's Software Index, you have the option of installing all licensed software or selectively installing software.

```

Load Software Menu
-----
* 1.  Load All Licensed Software (Recommended)
   2.  Selectively Load Software
-----
g: Go back   q: Quit   h: Help
-----

```

Load All Licensed Software

This option's behavior changes to fit your needs based upon the installation type chosen. Selecting this option for a new installation or upgrade will load all the software that is licensed for your installation. Selecting this option when updating an existing installation will allow you to load only the licensed software that is not already installed.

We recommend you choose this option when you want to install all the software for which you are licensed. You should also choose this option when adding licensed software to your existing SAS 9.1.3 Foundation installation.

Selectively Load Software

When you choose to selectively load software, you must manually choose all the software you wish to install from the Selective Software Menu.

We recommend this option only when you wish to install a subset of the software for which you are licensed. In most cases, you should choose Load All Licensed Software.

```

Selective Software Menu
-----
1.  Select National Language Support (NLS)
2.  Select Software Solutions
3.  Select Software Products
4.  Select Sample Programs
5.  Select SAS/GRAPH Map Data Sets
6.  Select SAS/GIS Census Tract Map Data Sets
7.  Preview Current Selections
8.  Install Current Selections
9.  Reset Current Selections
-----
g: Go back   q: Quit   h: Help
-----

```

When you choose any of the selection items from the Selective Software Menu, you will see a selection screen similar to the one below. The screen shows you which software is selected, which software was previously installed, and which software you are licensed to run.

```

----- PRODUCTS Selection Screen ----- Page 1 of 2
  '*' = selected   '|' = previously installed   '+' = licensed
-----

  1 +Base SAS                               2 +Enterprise Miner Server
  3 +IT Service Vision Server              4 +Risk Dimensions
  5 +SAS High-Performance Forecasting      6 +SAS Integration Technologies
  7 +SAS/ACCESS DB2                       8 +SAS/ACCESS ODBC
  9 +SAS/ACCESS ORACLE                    10 +SAS/ACCESS PC File Formats
 11 +SAS/ACCESS R/3                       12 +SAS/ACCESS SYBASE
 13 +SAS/AF                                14 +SAS/ASSIST
 15 +SAS/CONNECT                           16 +SAS/EIS
 17 +SAS/ETS                               18 +SAS/FSP
 19 +SAS/GENETICS                          20 +SAS/GIS
 21 +SAS/GRAPH                             22 +SAS/IML

--> Enter 'n' to view the next page of selections <--

0 items selected totaling 0 MB / 3462 MB available
-----
# : select item          -# : deselect item          n : next page          g : go back
#-# : select range      -#-# : deselect range        p : prev page         q : quit
* : select all          -* : deselect all           <Enter> : continue     h : help
-----

```

To select an item, enter the numbers associated with the names you want to select separated by spaces (such as 1 3 4 12), ranges of items you want to select (such as 1-5 8-10), or all software (*).

You may deselect items in the same manner, but with a minus (-) preceding the selection (such as -2 -9).

The note --> Enter 'n' to view the next page of selections <-- indicates there are multiple pages of selections. Enter 'n' to view the next page of selections and 'p' to return to a previous page. When there are multiple pages of selections, entering an asterisk (*) selects all items in the current category (e.g. all products or all sample programs), not just those currently visible.

When you are finished making selections, press Enter to return to the Selective Software Menu.

NLS Selections

If you selected Load All Licensed Software from the **Load Software** menu and there are any NLS localizations available, you will be asked if you want to select them for installation.

```

In addition to English, please select to install the NLS translations
for any of the following languages.

Press <Enter> to continue...

----- NLS Selection Screen ----- Page 1 of 1
  '*' = selected  '|' = previously installed  '+' = licensed
-----

1  Chinese (Simplified)           2  Chinese (Traditional)
3  DBCS Asian Language Support    4  French
5  German                        6  Hungarian
7  Korean                        8  Primary Japanese encoding
9  Secondary Japanese encoding    10 Spanish (Castilian)

-----

#: select item      -#: deselect item      n: next page      g: go back
#-#: select range  -#-#: deselect range   p: prev page     q: quit
*: select all      -*: deselect all      <Enter>: continue h: help
-----

```

Configuring User Authentication

Some SAS functionality requires that certain files within your SAS Foundation installation have setuid permissions as root. Answering 'yes' to the prompt will cause the installation program to prompt you for the root password during the automated post-processing phase of the install. At that time, the files will be updated with setuid root permissions. If you accept the default of 'no' you may be required to perform this file permission update via the Setup Utilities after the installation is complete. Refer to the Configuring User Authentication section of Chapter 5 for details on manually completing this step.

Certain SAS products and features employ functionality that require SAS to check userid authentication and file access authorizations. This in turn necessitates that certain files within your SAS installation have setuid permissions and be owned by root.

SAS Setup will perform this task for you in either one of two ways:

1. By prompting for the root password later during this installation.

SAS Setup will prompt you for the root password later during this installation and use it to complete this step immediately.

2. By running SAS Setup as root as a post-installation step.

Run SAS Setup as root after the installation completes, and perform this step from the SAS Setup Utilities Menu, as documented in your Installation Instructions. If you choose this option, the installation program will install and configure your SAS software without the root password, but the authentication/authorization functionality will not work until the steps involving the root id are performed. Any attempted use of this functionality will result in errors.

Prompt for root password later during this run? (N)
-->

Starting in Service Pack 4, the location of the maintenance files used for user authentication has changed to improve the Service Pack upgrade experience. With this Service Pack, if any of the following three files—`sasauth`, `sasperm`, and `elssrv`—requires maintenance, they are archived and delivered to the new directory `!SASROOT/utilities/bin/setuid` rather than to `!SASROOT/utilities/bin` directly. Note that in this Service Pack 4 only, `elssrv` and `sasauth` require maintenance so they are the only files delivered to this new install directory. As with previous versions of the UNIX Foundation Installer, you have the option of configuring the user authentication as part of the normal install post-processing by supplying the `rootuid` password during the post-processing step. The files that are present in the new `setuid` directory will be moved to the `utilities/bin` dir and then `setuid root` once the files are moved. The user can also elect to perform this configuration at a later time from the `sassetup` utilities menu post-installation.

If the target directory is NFS-mounted from a remote machine, `root` may not have write access due to an NFS security feature that disallows root write access to NFS-mounted directories by default. You can either install SAS with an account other than `root`, or you can grant `root` permission to write to the directory.

To grant `root` write access to an NFS-mounted directory, the export permissions for that directory will need to be modified on the remote machine. To modify the export permissions, see the man page for “exports” on the remote machine. For most UNIX platforms, modifying the permissions involves making revisions to the `/etc/exports` file, and then executing `exportfs -a` or sending a HUP signal to the `mountd` process for the changes to take effect. Remounting the directory will usually not be necessary.

Note: *Tru64 UNIX users will not see the above prompt. Instead, you will see a message indicating that this step will need to be performed separately, after the installation is complete.*

SAS/ACCESS Software Configuration

SAS/ACCESS software requires some post-installation configuration before it can be used. Part of this post-installation configuration can be completed during installation. If any SAS/ACCESS software selected for installation requires input from the installer, the following screen appears:

```

SAS/ACCESS Software Configuration

SAS/ACCESS software requires post-installation configuration
before you can use the software. Part of this configuration
is identifying the DBMS version you are running for the
selected SAS/ACCESS software products.

You have the option of performing this configuration step during
installation or at a later time after the installation is complete.

If you choose to configure SAS/ACCESS software during installation,
select the SAS/ACCESS software to configure from the list that
follows and provide answers to the additional questions when presented.

When your installation is complete, refer to the Configuration
Guide for details on how to complete your SAS/ACCESS software
configuration.

Would you like to configure your SAS/ACCESS software at this time? [Y]
-->
    
```

Answering Yes to the question in the above screen during installation is optional. If you choose to continue your SAS/ACCESS software configuration during installation, a screen similar to the following appears:

```

----- ACCESS Config Selection Screen ----- Page 1 of 1
' * ' = selected
-----

1  SAS/ACCESS DB2                2  SAS/ACCESS INFORMIX
3  SAS/ACCESS ORACLE             4  SAS/ACCESS SYBASE

-----

#: select item          -#: deselect item          n: next page          g: go back
#-#: select range      #-#: deselect range        p: prev page          q: quit
*: select all          -*: deselect all          <Enter>: continue     h: help
-----
    
```

Choose the SAS/ACCESS software you want to configure, and you will be prompted for specific information about each of your choices, for example:

```

Enter the version or release of the ORACLE software installed
or mounted on your system. If your version of ORACLE
software does not exactly match the list below, choose the
version closest to, but not greater than the version of
your ORACLE software.

Choose the version or release of your ORACLE software:
-----
1  8.1.7
2  9i
-----
g: Go back  q: Quit  h: Help
-----
    
```

If you choose to skip SAS/ACCESS software configuration during installation, you can complete it at a later time. Refer to “Running SAS/ACCESS Software Configuration” in Chapter 5 for details.

Whether you choose to continue or skip SAS/ACCESS software configuration at this time, you must complete the configuration before you can use SAS/ACCESS software. Refer to Chapter 3, “Post-Installation Configuration for SAS/ACCESS Software” in the *Configuration Guide* to complete the configuration.

Confirmation

Just before loading your selected software, SAS Setup completes some final checks to make sure it can properly load the software. SAS Setup also performs a final disk space check to make sure you have adequate free disk space to install. Finally, SAS Setup asks if you want to continue and install the selected software.

Attention: *This prompt is the last opportunity to go back or exit SAS Setup without writing to your system. If you choose to continue and later exit the installation, you will need to delete files written to your system.*

```
Final disk space requirements (in MB):
Total Available Disk Space:      3,249
Required for Installation:       562
                                -----
Remaining after Installation:    2,687
```

There is sufficient disk space for installation.

The interactive portion of SAS Setup is complete. If you choose to continue, SAS Setup will prompt you to mount the media it requires to complete the installation. If you choose not to continue, you can return to the interactive portion of SAS Setup and change your selections.

Do you wish to continue? [Y]

Step 6 - Software Loading Phase

All selected software is extracted from the CDs to the specified target directory during the software loading phase.

Software Loading

Prior to extracting files, SAS Setup lists all the CDs you will be prompted to mount. The CDs are listed in the order in which they will be used. This list of CDs is compiled based on your software selections and may not contain all the CDs in your Installation Kit.

```
Based on your software selections, SAS Setup requires the following
CDs to complete the installation. Make sure you can locate all the
CDs listed.
```

```
Label
-----
Software Disk 1
Software Disk 2
```

After displaying the list of required CDs, file extraction begins. Messages appear on the screen indicating that software is installing, for example:

```
Extracting Base SAS Software...
Extracting Base SAS Samples...
Extracting SAS/AF Software...
Extracting SAS/ASSIST Software...
Extracting SAS/CONNECT Software...
Extracting SAS/CONNECT Samples...
```

Mounting Additional CDs

SAS Setup will prompt for all additional CDs it requires to complete the installation during the software loading phase if it does not find the CD mounted. You have several options on how to mount any additional CDs required.

- Enter an exclamation mark (!) to start a Bourne sub-shell to mount and unmount your CD.
- Mount and unmount CDs from another window or process on your system.
- If your system is running an automount application, simply eject the current CD and insert the next CD.

Follow the same mount and unmount instructions used for the **SAS Setup Disk** for all additional CD mounts, as listed in the *SAS Software Navigator User's Guide* or in Chapter 3 of this document. SAS Setup will not prompt you for additional CD mounts if it finds installation CDs mounted in the same directory location.

SAS Setup displays a prompt for additional CDs that lists the CD it needs, for example:

```
Please mount the CD: Solutions Disk 1 (SLXQ25)

To unmount the current CD, you can enter an exclamation mark !
at the prompt to start a Bourne sub-shell, or you can unmount it from
another process or window.  Manually unmounting media requires
root privilege.

Provide the mount point for the CD at the prompt and press <Enter>.
[/cdrom]
-->
```

When you have mounted the requested CD, enter the mount point at the prompt and press Enter. If you cannot locate the requested CD, you must exit SAS Setup by entering Q at the media prompt. Exiting SAS Setup during the software loading phase will result in an incomplete installation and you will have to delete the SASROOT directory before running SAS Setup again.

Step 7 - Automated Post-Processing Phase

Immediately following the software loading phase, SAS Setup performs tasks to configure SAS 9.1.3 Foundation for use during the automated post-processing phase. Some examples of these tasks are building help files, building the SAS registry file, and performing product-specific configuration.

Post-processing tasks are listed on the screen as they are run and saved to installation log files for later reference. A clear indication of the status of each post-processing task is listed so you can easily scroll through the list and search for errors.

The following is a sample installation log file of post-processing tasks being executed:

```
-----
Creating SAS Config files
Please wait...

Creating the SAS Config file for the following directory:
  /usr/local/SAS/SAS_9.1
SAS Config file creation is complete.

-----
Creating SAS Config files
Please wait...

Creating the SAS Config file for the following directory:
  /usr/local/SAS/SAS_9.1/nls/en
SAS Config file creation is complete.

-----
Creating directories
Please wait...
```



```

The following directory has been created:
/usr/local/SAS/SAS_9.1/nls/en/sascfg

SAS Config file creation is complete.

-----

Creating the SAS invocation scripts and environment file.
Please wait...

SAS invocation script creation complete.

-----

Patching SAS executable files.
Please wait...

Patching is complete.

```

Automated post-processing is the final step in the installation process. When post-processing is complete, SAS Setup prints a final installation status and exits. If errors were detected during installation, they are listed in the completion status. The following is a snapshot of the completion status that is reported:

```

SAS 9.1 Installation Setup is complete.

Certain SAS products and features employ functionality that require
SAS to check userid authentication and file access authorizations.
This in turn necessitates that certain files within your SAS installation
have setuid permissions and be owned by root. Please refer to the Configuring
User Authentication section of your SAS Installation Guide for more
information on performing this configuration step via SAS Setup.

Results:
  Warnings: 0
  Errors: 0

Please review your installation log file, found in:
/usr/local/SAS/SAS_9.1/install/admin/logs/install_log_031215.000

```

Note: *The paragraph about user authentication in this screen will only appear if you have decided not to perform the user authentication step described on page 13.*

Step 8 - Reviewing Installation Log Files

All the files located in the `!SASROOT/install` directory should be viewed only. Do not edit or delete these files. SAS Setup uses these files to determine the state of your SAS 9.1.3 Foundation installation for all subsequent tasks.

Log Files

SAS Setup creates installation log files whenever it is run. These installation log files contain useful diagnostic information about any warnings or errors that may have occurred during the installation process. You should review the installation log files after the installation has completed. The installation log files reside in the following directories:

<code>!SASROOT/install/admin/logs</code>	Contains most of the installation log files, including install logs, extraction logs, and post-processing logs.
<code>!SASROOT/install/admin/logs_sh</code>	Contains some installation log files for SAS Setup when run from the <i>SAS Setup Disk</i> . These log files track the events of unloading the installation scripts from the CD.
<code>!SASROOT/install/admin/sas</code>	Contains the log files for post-processing tasks that run SAS 9.1.3 Foundation.

History File

In addition to the installation log files, an install history file is created. The history file contains the history of the software that was installed during the installation process. The history file is updated whenever new software is installed. The history file is:

```
!SASROOT/install/admin/history.install
```

Backup Files

SAS Setup saves versions of several files that may have been modified at your site, such as the config file and the news file. If you want to retrieve modifications to files that have been saved by SAS Setup, they can be found in:

```
!SASROOT/install/admin/backups
```

Step 9 – After Installing

After you have installed your software, be sure to continue to Chapters 5 and 6 for post-installation steps and information about maintaining your SAS 9.1.3 Foundation installation.

Chapter 3 – Installing SAS 9.1.3 Foundation from the SAS Setup Disk

This chapter describes the pre-installation and installation steps necessary for SAS Setup to install SAS 9.1.3 Foundation. SAS Setup is provided on the *SAS Setup Disk*, as well as installed along with SAS 9.1.3 Foundation.

Step 1 – Installation Requirements

All that is required to complete your installation is the proper CD Set to install from and your SAS Installation Data.

CD Set

The CD Set refers to the set of CDs that make up your software order. It is found in the Installation Kit. A CD Set value is printed on the **SAS Setup Disk**, along with the date it was manufactured, to assist you in locating the correct set of CDs to complete your installation. The CD Set for SAS 9.1.3 Foundation consists of the following:

- **SAS Setup Disk**
- Software Disks (one or more numerically labeled, such as **Software Disk 1**)

SAS Installation Data

SAS Installation Data consists of customized installation information and customized product authorization information provided by SAS. SAS will send a Software Order E-mail to the SAS Installation Representative at your site. This Software Order E-mail contains your SAS Installation Data in a text attachment. Instructions in the Software Order E-mail explain where and how to save the text attachment for later use. If you cannot locate the correct SAS Installation Data, you can visit the Web site <http://support.sas.com/adminservices-SID> to have your Software Order E-mail re-sent to the SAS Installation Representative at your site.

Step 2 – Verifying Your Environment

Alert Notes

Alert Notes list any installation-related issues you should be aware of before installing or using SAS software. Review the *Alert Notes* in your Installation Kit and familiarize yourself with any issues before installing or using SAS software.

Product-specific Alert Notes are not included in your Installation Kit. You can access product-specific Alert Notes from the following Web site:

http://support.sas.com/techsup/search/alert_search.html

System Requirements

SAS 9.1.3 supports specific releases and versions of various UNIX operating systems. Review the *System Requirements* in your Installation Kit and verify that your system meets the minimum operating system, memory, and disk space requirements before you begin installing SAS 9.1.3 Foundation. Installation of SAS 9.1.3 Foundation will not be successful if the minimum system requirements have not been met.

Accounts and Permissions

SAS highly recommends that you perform all of your installs using the *sas* account. While this can be any user id, we recommend you choose an account such as *sas* or *sassys*. Once chosen, this user id is referred to as the *sas* account. Doing so allows consistent ownership and file permissions to be maintained.

Installing SAS 9.1.3 Foundation on UNIX requires that you have appropriate permission to access CDs or network-mounted files and have write access to your intended target directory.

The following steps will require use of the *root* account during a SAS 9.1.3 Foundation install.

- If you are not using an automount program, you must be root to mount and unmount CDs. This means you must mount and unmount CDs from a separate process or sub-process. You will not be prompted to mount CDs when you install from a SAS Software Depot.
- You must perform the Configure User Authentication step to change the *setuid* permissions of certain files to root during the post-processing stage of the install. See “Configure User Authentication” in this chapter and “Configure User Authentication” in Chapter 5 for more details.

Adequate Free Disk Space

3. Make sure you have adequate free disk space in the */tmp* directory to load the install properly.
 - You will need approximately 30 MB of free space in */tmp*.
 - This space is freed upon completion of the install.
4. Make sure you have enough free space in the target directory to install all the software for which you are licensed.
 - You can approximate the amount of disk space you will need by comparing the list of licensed software in the *SAS Order Information* document with the *System Requirements* document.

If you need to contact SAS for help in finding any of this information, refer to the *SAS Technical Support Information* document for information about who to contact and how to contact them. The document may be located by opening the **Documentation for Installing and Configuring SAS** CD or Install Center. On the first page, select **SAS Basic Installation Edition Kit**, then select **SAS Technical Support Information** in the “Service and Support” section.

Step 3 – Preparing for Installation

In preparation for your installation, you need to consider the following issues so you can provide appropriate responses to SAS Setup prompts. You need to determine all of the following information prior to running SAS Setup.

Installation Type

Determine the type of installation you will perform – create a new installation or update an existing installation.

- | | |
|-----------------------|--|
| New installation | This creates a new, independent installation of SAS 9.1.3 Foundation. A new installation requires an empty directory location in which to install SAS 9.1.3 Foundation. |
| Existing installation | This updates an existing installation of SAS Foundation. Choose this type when you want to upgrade your installation to 9.1.3 or add products to your existing 9.1.3 installation. Updating an existing installation requires that you specify the SASROOT directory of that existing installation. Upgrading to SAS 9.1.3 Foundation from any release of SAS earlier than 9.1 is not valid. |

Target Directory

Determine the target directory in which you intend to install SAS 9.1.3 Foundation. Make sure you have write access to this target directory. The target directory of your SAS 9.1.3 installation will be referred to as SASROOT. In the examples in this manual, `/usr/local/SAS/SAS_9.1` has been used for the SASROOT directory.

- | | |
|-----------------------|---|
| New installation | You must choose a directory that is empty. You can choose a directory that does not already exist and SAS Setup will create it for you. |
| Existing installation | You must specify the directory of an existing installation. Determine the full directory path of your existing SAS Foundation installation. |

If the target directory is NFS-mounted from a remote machine, `root` may not have write access due to an NFS security feature that disallows root write access to NFS-mounted directories by default. You can either install SAS with an account other than `root`, or you can grant `root` permission to write to the directory.

To grant `root` write access to an NFS-mounted directory, the export permissions for that directory will need to be modified on the remote machine. To modify the export permissions, see the man page for “exports” on the remote machine. For most UNIX platforms, modifying the permissions involves making revisions to the `/etc/exports` file, and then executing `exportfs -a` or sending a HUP signal to the `mountd` process for the changes to take effect. Remounting the directory will usually not be necessary.

Java Runtime Environment

Some features in SAS 9.1.3 require the use of a SAS-specific version of the Java Runtime Environment (JRE) which is included in a SAS 9.1.3 Foundation installation.

If you are performing a new installation and SAS 9.1.3 Foundation has previously been installed on this computer, you need to determine whether or not the new SAS installation should contain its own copy of the JRE.

At the time of the previous installation, SAS Setup created a `.sasprefs` file in the home directory of the user performing the install. Data in this file specifies the location of the installed JRE. The new installation will use the JRE pointed to by the `.sasprefs` file by default, assuming the `.sasprefs` file exists. If you choose to share the previously installed JRE with the new installation, the original JRE installation pointed to by the `.sasprefs` file must not be deleted or the new installation of SAS will no longer work.

If you prefer that your new SAS installation contain its own copy of the JRE to avoid concerns about keeping the previous installation, you should rename or delete the pre-existing `.sasprefs` file prior to performing your new SAS installation.

SAS Installation Data Source

SAS Installation Data consists of customized installation information and customized product authorization information provided by SAS. SAS will send a Software Order E-mail to the SAS Installation Representative at your site. This Software Order E-mail contains your SAS Installation Data in a text attachment. Instructions in the Software Order E-mail explain where and how to save the text attachment for later use. If you cannot locate the correct SAS Installation Data, you can visit the Web site <http://support.sas.com/adminservices-SID> to have your Software Order E-mail re-sent to the SAS Installation Representative at your site.

Step 4 – Mounting Installation CDs

Mounting Instructions

Complete the following steps to properly mount the installation CDs. Use these instructions for mounting your *SAS Setup Disk* and any SAS Software Disks you are prompted to mount.

1. If you are beginning an installation, locate the CD labeled **SAS Setup Disk** in your Installation Kit. Otherwise, locate the CD that SAS Setup has prompted you to mount.
- 2a. If your operating system uses an automatic mount feature (such as `vold` on the Solaris operating system):

To mount a CD, place the CD in the CD-ROM drive and close the tray. The CD will automatically be mounted.

To unmount a CD, issue the appropriate command (such as `eject`) or press the eject button on your CD-ROM drive.

Skip to “Step 5 – Running SAS Setup.”

2b. If you need to manually mount CDs on your operating system:

Manually mounting a CD requires root privilege. Log in as `root` to manually mount the CD:

```
$ su root
```

On single-drive systems, the CDs must be unmounted and mounted often. SAS recommends that you maintain a separate root user ID window for mounting and unmounting the CDs, while running the SAS Software Navigator in a different window.

If you already have a CD mounted in the CD-ROM drive you intend to use, unmount the CD before continuing. To manually unmount the CD, issue the `umount` command, for example:

```
# umount /mnt/cdrom
```

Insert the appropriate CD in your CD-ROM drive. SAS Setup will list the CD label and volume ID of the CD you are required to mount.

3. Create a local directory to serve as your mount point, for example:

```
# mkdir /mnt/cdrom
```

Note: The above examples assume your CD is mounted as `/mnt/cdrom`. You may choose another location and substitute that location appropriately in these instructions.

4. Mount the **SAS Setup Disk** or the SAS Software Disk asked for in the media prompt using one of the following examples corresponding to your operating system. Substitute the actual device names where appropriate in the examples shown. SAS 9.1.3 Foundation supports ISO-9660 CD-ROM and Rockridge extensions where available.

The mount command follows this format:

```
# mount [options] device mount_point
```

where `[options]` are valid mount options for the operating system, `device` is the device name specific to your CD-ROM drive, and `mount_point` is the directory used as the mount point for the CD, for example:

AIX

```
# mount -r -v cdrfs /dev/cd0 /mnt/cdrom
```

HP-UX and HP-UX for the Itanium Processor Family

```
# mount -F cdfs -o rr,ro /dev/dsk/cd0 /mnt/cdrom
```

Linux for Intel Architecture and Linux for Itanium-based Systems

```
# mount -r /dev/cd0 /mnt/cdrom
```

Note: If you are installing Red Hat Enterprise Linux 3 Update 7 and later, Red Hat has made changes that interfere with the standard SAS installer operation. To work around those changes, add `noexec=off` as a kernel boot parameter. You may choose to do this in `grub/lilo`.

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

Solaris and Solaris for x64

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

Tru64 UNIX

```
# mount -rt cdfs -o noversion,rrip /dev/cd0 /mnt/cdrom
```

5. We recommend against installing SAS 9.1.3 Foundation as root. You should exit your root session before performing the installation.

```
# exit
```

Remote Mounting

If your CD-ROM drive resides on another host, and is properly exported, mount the CD using NFS by issuing a command similar to the following:

```
# mount -o ro <remotehost>:/<cd-rom-dir> /mnt/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.

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

Copying the CDs to a Disk Location (SAS Software Depot)

You have the option of copying all of your installation CDs to a disk location, or SAS Software Depot, prior to running SAS Setup. This avoids being prompted to mount each CD when it is needed. When you copy your CDs to a disk location, SAS Setup will automatically search the disk location for any additional CDs it requires and skips the prompt if it finds it.

Step 5 - Running SAS Setup

Running SAS Setup from the Mounted SAS Setup Disk

Invoke SAS Setup from the mounted *SAS Setup Disk* as shown in the following examples. You **do not** have to change your working directory to the mounted CD or your target directory to launch SAS Setup.

```
$ /mnt/cdrom/SASSETUP
```

When you run SAS Setup from the *SAS Setup Disk*, you have the option of performing a new installation or updating an existing installation. You cannot run setup utilities from the *SAS Setup Disk*.

Note: *SAS formerly supported running SAS Setup from an existing SAS 9.1.3 Foundation installation. That method is no longer supported. You must use the method described above.*

Running SAS Setup in Quiet Mode

SAS Setup supports a quiet mode of operation where it will not prompt you for required information. This is accomplished by passing command-line flags to SAS Setup. There are three command-line flags required to run SAS Setup in quiet mode:

`-source directory [directory...]` where *directory* is the location of the *SAS Setup Disk*. You can specify other directories if additional CDs are located in different locations.

`-dest directory` where *directory* is the target directory of your SAS 9.1.3 installation.

`-sid file` where *file* is the file specification of the file containing your SAS Installation Data.

For example, you can perform an installation in quiet mode from the mount points `/mnt/cdrom/cd0` and `/mnt/cdrom/cd1` to the target directory `/usr/local/SAS/SAS_9.1` using the SAS Installation Data saved in `/disk1/sas9012345.txt`, as follows:

```
$ /mnt/cdrom/cd0/SASSETUP -source /mnt/cdrom/cd0 /mnt/cdrom/cd1 \
> -dest /usr/local/SAS/SAS_9.1 -sid /disk1/sas9012345.txt
```

SAS Setup Help

To view help information, invoke SAS Setup using the `-help` command-line flag, as follows:

```
$ /mnt/cdrom/SASSETUP -help
```

or:

```
$ !SASROOT/sassetup -help
```

Step 6 - Prompting Phase

The prompting phase presents a series of menus and prompts to gather all the necessary information to complete the installation.

Conventions

The first screen you see when you run SAS Setup is the Welcome screen. It lists the conventions used in the installation program.

```

SAS Installation Setup

Welcome to SAS Setup, the program used to install and maintain your
SAS software. SAS Setup guides you through a series of menus and prompts
to gather the information it requires to complete its tasks.

Some conventions used throughout SAS Setup are:
  * indicates which menu selection is the default choice
  ( ) indicates the default response to a prompt
  ! starts a sub-shell on your system
  h displays help for a menu selection or prompt
  g goes back to a previous menu selection or prompt
  q quits SAS Setup at any point

SAS Setup is fully documented in the installation instructions included
in your Installation Kit.

Press <Enter> to continue...
```

Primary Menu Options

Depending on where you launched SAS Setup from, you have the choice of performing a new installation, updating an existing installation, or running setup utilities to maintain an existing installation.

If you launched SAS Setup from the *SAS Setup Disk*, you will see the following choices in the SAS Setup Primary Menu:

```
Primary Menu
-----
1.  Perform a New Installation
2.  Update an Existing Installation
-----
g: Go back   q: Quit     h: Help
-----
```

If you launched SAS Setup from the SASROOT directory, you will see the following choices in the SAS Setup Primary menu:

```
Primary Menu
-----
1.  Update an Existing Installation
2.  Run Setup Utilities
-----
g: Go back   q: Quit     h: Help
-----
```

Perform a New Installation

A new installation is the recommended option for installing SAS 9.1.3 Foundation, either as a clean install or as a step in upgrading to SAS 9.1.3 Foundation. You can have as many SAS 9.1.3 Foundation installations on a system as you like. Upgrading to SAS 9.1.3 Foundation from any release of SAS earlier than 9.1 is not valid.

Update an Existing Installation

This option is typically chosen when upgrading to a SAS 9.1.3 Foundation installation or adding software to an existing SAS 9.1.3 Foundation installation. Updating an existing installation requires that you specify the SASROOT directory of that existing installation. Upgrading to SAS 9.1.3 Foundation from any release of SAS earlier than 9.1 is not valid.

Run Setup Utilities

Running Setup Utilities allows you to perform maintenance tasks to an existing installation of SAS 9.1.3 Foundation, such as renewing your license information.

SAS Installation Data Source

You **must** obtain your SAS Installation Data to complete the installation.

```
Obtain SAS Installation Data

SAS Installation Data tailors the installation specifically for
your site.

Enter the filename or directory path containing your SAS Installation Data.
-->
```

After entering your information, you will receive a confirmation that your SAS Installation Data was successfully retrieved or an appropriate error message.

```
SAS Installation Data retrieved successfully.
```

Target Directory

The target directory location is where you want to install or have previously installed SAS 9.1.3 Foundation. This location is also referred to as SASROOT. Make a note of the full directory path of your target directory so you can provide the information when prompted.

```
Specify Target Directory

Please enter the full directory path of the target location for the
installation of SAS. The directory you specify must be the root
directory of an existing SAS installation of the same release.

Target location path? [/usr/local/SAS/SAS_9.1]
-->
```

Make sure there is adequate free disk space available in the target directory. You can estimate the disk space requirements from the “Space Requirements” section listed in the *System Requirements*.

Loading Options

You have the option of installing all licensed software or selectively installing software.

```
Load Software Menu
-----
* 1. Load All Licensed Software (Recommended)
  2. Selectively Load Software
-----
g: Go back   q: Quit     h: Help
-----
```

Load All Licensed Software

Based upon the installation type chosen, this option's behavior changes to fit your needs. Selecting this option for a new installation will load all the software that is licensed for your installation. Selecting this option when updating an existing installation will load only the licensed software that is not already installed.

We recommend you choose this option when you want to install all the software for which you are licensed. You should also choose this option when adding licensed software to your existing SAS 9.1.3 Foundation installation.

Selectively Load Software

When you choose to selectively load software, you must manually choose all the software you wish to install from the Selective Software Menu.

We recommend this option only when you wish to install a subset of the software for which you are licensed. In most cases, you should choose Load All Licensed Software.

```

Selective Software Menu
-----
 1.  Select National Language Support (NLS)
 2.  Select Software Products
 3.  Select Sample Programs
 4.  Select SAS/GRAPH Map Data Sets
 5.  Select SAS/GIS Census Tract Map Data Sets
 6.  Preview Current Selections
 7.  Install Current Selections
 8.  Reset Current Selections
-----
g: Go back   q: Quit     h: Help
-----
    
```

When you choose any of the selection items from the Selective Software Menu, you will see a selection screen similar to the one below. The screen shows you which software is selected, which software was previously installed, and which software you are licensed to run.

```

----- PRODUCTS Selection Screen ----- Page 1 of 2
'*' = selected  '|' = previously installed  '+' = licensed
-----
 1  +Base SAS                               2  +Enterprise Miner Server
 3  +IT Service Vision Server               4  +Risk Dimensions
 5  +SAS High-Performance Forecasting       6  +SAS Integration Technologies
 7  +SAS/ACCESS DB2                        8  +SAS/ACCESS ODBC
 9  +SAS/ACCESS ORACLE                     10 +SAS/ACCESS PC File Formats
11  +SAS/ACCESS R/3                        12 +SAS/ACCESS SYBASE
13  +SAS/AF                                 14 +SAS/ASSIST
15  +SAS/CONNECT                           16 +SAS/EIS
17  +SAS/ETS                               18 +SAS/FSP
19  +SAS/GENETICS                          20 +SAS/GIS
21  +SAS/GRAPH                              22 +SAS/IML
--> Enter 'n' to view the next page of selections <--

0 items selected totaling 0 MB / 3462 MB available
-----
#: select item      -#: deselect item      n: next page      g: go back
#-#: select range  #-#: deselect range    p: prev page      q: quit
*: select all      -*: deselect all       <Enter>: continue  h: help
-----
    
```

To select an item, enter the numbers associated with the names you want to select separated by spaces (such as 1 3 4 12), ranges of items you want to select (such as 1-5 8-10), or all software (*).

You may deselect items in the same manner, but with a minus (-) preceding the selection (such as -2 -9).

The note --> Enter 'n' to view the next page of selections <-- indicates there are multiple pages of selections. Enter 'n' to view the next page of selections and 'p' to return to a previous page. When there are multiple pages of selections, entering an asterisk (*) selects all items in the current category (e.g. all products or all sample programs), not just those currently visible.

When you are finished making selections, press Enter to return to the Selective Software Menu.

NLS Selections

If there are any NLS localizations included and if you have chosen Load All Licensed Software, you will be asked if you want to select them for installation.

```

In addition to English, please select to install the NLS translations
for any of the following languages.

Press <Enter> to continue...

----- NLS Selection Screen ----- Page 1 of 1
  '*' = selected   '|' = previously installed   '+' = licensed
-----

1  Chinese (Simplified)           2  Chinese (Traditional)
3  DBCS Asian Language Support    4  French
5  German                        6  Hungarian
7  Korean                        8  Primary Japanese encoding
9  Secondary Japanese encoding    10 Spanish (Castilian)

-----

#: select item           -#: deselect item           n: next page           g: go back
#-#: select range       -#-#: deselect range       p: prev page          q: quit
*: select all           -*: deselect all           <Enter>: continue     h: help
-----

```

Configuring User Authentication

Some SAS functionality requires that certain files within your SAS Foundation installation have `setuid` permissions as root. Answering 'yes' to the prompt will cause the installation program to prompt you for the root password during the automated post-processing phase of the install. At that time, the files will be updated with `setuid` root permissions. If you accept the default of 'no' you may be required to perform this file permission update via the Setup Utilities after the installation is complete. Refer to the Configuring User Authentication section of Chapter 5 for details on manually completing this step.

```
Certain SAS products and features employ functionality that require SAS to check userid authentication and file access authorizations. This in turn necessitates that certain files within your SAS installation have setuid permissions and be owned by root.
```

```
SAS Setup will perform this task for you in either one of two ways:
```

1. By prompting for the root password later during this installation.

```
SAS Setup will prompt you for the root password later during this installation and use it to complete this step immediately.
```

2. By running SAS Setup as root as a post-installation step.

```
Run SAS Setup as root after the installation completes, and perform this step from the SAS Setup Utilities Menu, as documented in your Installation Instructions. If you choose this option, the installation program will install and configure your SAS software without the root password, but the authentication/authorization functionality will not work until the steps involving the root id are performed. Any attempted use of this functionality will result in errors.
```

```
Prompt for root password later during this run? (N)
-->
```

Note: *Tru64 UNIX users will not see the above prompt. Instead, you will see a message indicating that this step will need to be performed separately, after the installation is complete.*

Starting in Service Pack 4, the location of the maintenance files used for user authentication has changed to improve the Service Pack upgrade experience. With this Service Pack, if any of the following three files—`sasauth`, `sasperm`, and `elssrv`—requires maintenance, they are archived and delivered to the new directory `!SASROOT/utilities/bin/setuid` rather than to `!SASROOT/utilities/bin` directly. Note that in this Service Pack 4 only, `elssrv` and `sasauth` require maintenance so they are the only files delivered to this new install directory. As with previous versions of the UNIX Foundation Installer, you have the option of configuring the user authentication as part of the normal install post-processing by supplying the rootuid password during the post-processing step. The files that are present in the new `setuid` directory will be moved to the `utilities/bin` dir and then `setuid` root once the files are moved. The user can also elect to perform this configuration at a later time from the `sassetup` utilities menu post-installation.

SAS/ACCESS Software Configuration

SAS/ACCESS software requires some post-installation configuration before it can be used. Part of this post-installation configuration can be completed during installation. If any SAS/ACCESS software selected for installation requires input from the installer, the following screen appears:

```

SAS/ACCESS Software Configuration

SAS/ACCESS software requires post-installation configuration
before you can use the software. Part of this configuration
is identifying the DBMS version you are running for the
selected SAS/ACCESS software products.

You have the option of performing this configuration step during
installation or at a later time after the installation is complete.

If you choose to configure SAS/ACCESS software during installation
(which is recommended), select the SAS/ACCESS software to configure
from the list that follows and provide answers to the additional
questions when presented.

When your installation is complete, refer to the Configuration
Guide for details on how to complete your SAS/ACCESS software
configuration.

Would you like to configure your SAS/ACCESS software at this time? [Y]
-->
    
```

Answering Yes to the question in the above screen during installation is optional. If you choose to continue your SAS/ACCESS software configuration during installation, a screen similar to the following appears:

```

----- ACCESS Config Selection Screen ----- Page 1 of 1
' * ' = selected
-----

1  SAS/ACCESS DB2                2  SAS/ACCESS INFORMIX
3  SAS/ACCESS ORACLE             4  SAS/ACCESS SYBASE

-----

#: select item          -#: deselect item          n: next page          g: go back
#-#: select range      -#-#: deselect range        p: prev page          q: quit
*: select all          -*: deselect all          <Enter>: continue     h: help
-----
    
```

Choose the SAS/ACCESS software you want to configure, and you may be prompted for specific information about each of your choices, for example:

```
Enter the version or release of the ORACLE software installed
or mounted on your system.  If your version of ORACLE
software does not exactly match the list below, choose the
version closest to, but not greater than the version of
your ORACLE software.

Choose the version or release of your ORACLE software:
-----

1   8.1.7
2   9i
-----
g: Go back   q: Quit   h: Help
-----
```

If you choose to skip SAS/ACCESS software configuration during installation, you can complete it at a later time. Refer to Chapter 5, “Running SAS/ACCESS Software Configuration” for details.

Whether you choose to continue or skip SAS/ACCESS software configuration at this time, you must complete the configuration before you can use SAS/ACCESS software. Refer to Chapter 3, “Post-Installation Configuration for SAS/ACCESS Software” in the *Configuration Guide* to complete the configuration.

Confirmation

Just before loading your selected software, SAS Setup completes some final checks to make sure it can properly load the software. SAS Setup also performs a final disk space check to make sure you have adequate free disk space to install. Finally, SAS Setup asks if you want to continue and install the selected software.

Attention: *This prompt is the last opportunity to go back or exit SAS Setup without writing to your system. If you choose to continue and later exit the installation, you will need to delete files written to your system.*

```
Final disk space requirements (in MB):
Total Available Disk Space:      3,249
Required for Installation:       562
-----
Remaining after Installation:    2,687

There is sufficient disk space for installation.

The interactive portion of SAS Setup is complete.  If you choose to
continue, SAS Setup will prompt you to mount the media it requires to
complete the installation.  If you choose not to continue, you can
return to the interactive portion of SAS Setup and change your
selections.

Do you wish to continue?  [Y]
```


Step 7 - Software Loading Phase

All selected software is extracted from the CDs to the specified target directory during the software loading phase.

Software Loading

Prior to extracting files, SAS Setup lists all the CDs you will be prompted to mount. The CDs are listed in the order in which they will be used. This list of CDs is compiled based on your software selections and may not contain all the CDs in your Installation Kit.

```
Based on your software selections, SAS Setup requires the following
CDs to complete the installation. Make sure you can locate all the
CDs listed.
```

```
Label
-----
Software Disk 1
Software Disk 2
```

After displaying the list of required CDs, file extraction begins. Messages appear on the screen indicating that software is installing, for example:

```
Extracting Base SAS Software...
Extracting Base SAS Samples...
Extracting SAS/AF Software...
Extracting SAS/ASSIST Software...
Extracting SAS/CONNECT Software...
Extracting SAS/CONNECT Samples...
```

Mounting Additional CDs

SAS Setup will prompt for all additional CDs it requires to complete the installation during the software loading phase if it does not find the CD mounted. You have several options on how to mount any additional CDs required.

- Enter an exclamation mark (!) to start a Bourne sub-shell to mount and unmount your CD.
- Mount and unmount CDs from another window or process on your system.
- If your system is running an automount application, simply eject the current CD and insert the next CD.

Follow the same mount and unmount instructions used for the **SAS Setup Disk** for all additional CD mounts, as discussed previously in “Step 4 - Mounting Installation CDs”. SAS Setup will not prompt you for additional CD mounts if it finds installation CDs mounted in the same directory location.

SAS Setup displays a prompt for additional CDs that lists the CD it needs, for example:

```
Please mount the CD: Solutions Disk 1 (SLXQ25)

To unmount the current CD, you can enter an exclamation mark !
at the prompt to start a Bourne sub-shell, or you can unmount it from
another process or window.  Manually unmounting media requires
root privilege.

Provide the mount point for the CD at the prompt and press <Enter>.
[/cdrom]
-->
```

When you have mounted the requested CD, enter the mount point at the prompt and press Enter. If you cannot locate the requested CD, you must exit SAS Setup by entering Q at the media prompt. Exiting SAS Setup during the software loading phase will result in an incomplete installation and you will have to delete the SASROOT directory before running SAS Setup again.

Step 8 - Automated Post-Processing Phase

Immediately following the software loading phase, SAS Setup performs tasks to configure SAS 9.1.3 Foundation for use during the automated post-processing phase. Some examples of these tasks are building help files, building the SAS registry file, and performing product-specific configuration.

Post-processing tasks are listed on the screen as they are run and saved to installation log files for later reference. A clear indication of the status of each post-processing task is listed so you can easily scroll through the list and search for errors.

The following is a sample installation log file of post-processing tasks being executed:

```
-----
Creating SAS Config files
Please wait...

Creating the SAS Config file for the following directory:
  /usr/local/SAS/SAS_9.1

SAS Config file creation is complete.

-----
Creating SAS Config files
Please wait...

Creating the SAS Config file for the following directory:
  /usr/local/SAS/SAS_9.1/nls/en

SAS Config file creation is complete.

-----
Creating directories
Please wait...

The following directory has been created:
  /usr/local/SAS/SAS_9.1/nls/en/sascfg

SAS Config file creation is complete.
```

```

-----
Creating the SAS invocation scripts and environment file.
Please wait...

SAS invocation script creation complete.
-----

Patching SAS executable files.
Please wait...

Patching is complete.

```

Automated post-processing is the final step in the installation process. When post-processing is complete, SAS Setup prints a final installation status and exits. If errors were detected during installation, they are listed in the completion status. Following is a snapshot of the completion status that is reported:

```

SAS 9.1 Installation Setup is complete.

Results:
  Warnings: 0
  Errors: 0

Please review your installation log file, found in:
  /usr/local/SAS/SAS_9.1/install/admin/logs/install_log_031215.000

```

Step 9 - Reviewing Installation Log Files

All the files located in the `!SASROOT/install` directory should be viewed only. Do not edit or delete these files. SAS Setup uses these files to determine the state of your SAS 9.1.3 Foundation installation for all subsequent tasks.

Log Files

SAS Setup creates installation log files whenever it is run. These installation log files contain useful diagnostic information about any warnings or errors that may have occurred during the installation process. You should review the installation log files after the installation has completed. The installation log files reside in the following directories:

<code>!SASROOT/install/admin/logs</code>	Contains most of the installation log files, including install logs, extraction logs, and post-processing logs.
<code>!SASROOT/install/admin/logs_sh</code>	Contains some installation log files for SAS Setup when run from the <i>SAS Setup Disk</i> . These log files track the events of unloading the installation scripts from the CD.
<code>!SASROOT/install/admin/sas</code>	Contains the log files for post-processing tasks that run SAS 9.1.3 Foundation.

History File

In addition to the installation log files, an install history file is created. The history file contains the history of the software that was installed during the installation process. The history file is updated whenever new software is installed. The history file is:

```
!SASROOT/install/admin/history.install
```

Backup Files

SAS Setup saves versions of several files that may have been modified at your site, such as the config file and the news file. If you want to retrieve modifications to files that have been saved by SAS Setup, they can be found in:

```
!SASROOT/install/admin/backups
```

For information about restoring backed-up files, see “Restoring Backed-up Files” on page 55.

Step 10 – After Installing

After you have installed your software, be sure to continue to Chapters 5 and 6 for post-installation steps and information about maintaining your SAS 9.1.3 Foundation installation.

Chapter 4 – Upgrading to SAS 9.1.3 Foundation

You may upgrade to SAS 9.1.3 Foundation via one of two methods: via staged update, by which SAS 9.1.3 Foundation is installed in a different directory on the same machine or even a different machine from your existing SAS 9.1 Foundation installation, or via an update in place, where SAS 9.1.3 Foundation is written over your existing SAS 9.1 Foundation installation. Both of these methods are described in the sections below.

Staged Update

A staged update is the installation of SAS 9.1.3 Foundation in a location other than the existing SAS 9.1 Foundation installation. The new location can be a separate directory on the same machine that the original installation resides on or on a different machine entirely.

Step 1 – Perform an Installation in a New Location

Follow the procedures described in Chapter 2 to install SAS 9.1.3 Foundation in a different directory or different machine than your existing SAS Foundation installation.

Step 2 – Point the Existing Configuration Files to the New Location

Since you are installing the software in the same configuration as your existing SAS 9.1 Foundation installation with only its location changed, you need only modify the configuration files to point to the SAS 9.1.3 Foundation installation. The complete instructions for this process are located in the *SAS Intelligence Platform: Planning and Administration Guide*. Specifically, refer to the “Updating After Testing in a Test Environment” section in Appendix 3, “Updating a 9.1 or 9.1.2 System to 9.1.3.”

Updating in Place

Updating in place writes SAS 9.1.3 Foundation over your existing SAS 9.1 or SAS 9.1.2 Foundation installation.

Install SAS 9.1.3 Foundation according to the procedures described in Chapter 2. Based on your SAS Installation Data and the existence of a `!SASROOT` directory with a prior SAS Foundation image in it, the installation process will decide if an update is the appropriate install path. If an update is indicated, you will be prompted for confirmation that you wish to proceed with an update. During the update, files that may have contained user modifications will be backed up by the installation process before the image is updated with SAS 9.1.3 Foundation.

If you configured files for user authentication in SAS 9.1 or SAS 9.1.2 Foundation, you will be prompted for the root password so that permissions can be reverted before the new image is installed. The installation will prompt you to re-configure user authentication at the appropriate place in the process for your updated image.

Once you finish the procedures described in Chapter 2, you may need to configure your installation. Refer to the “Updating After Testing in a Test Environment” section in Appendix 2, “Updating a 9.1 or 9.1.2 System to 9.1.3” of the *SAS Intelligence Platform: Administration Guide*, located at <http://support.sas.com/documentation/configuration/913admin.html> for information about configuring your update.

After Upgrading

After you have upgraded your software, be sure to continue to Chapters 5 and 6 for post-installation steps and information about maintaining your SAS 9.1.3 Foundation installation.

Chapter 5 – Setting Up SAS 9.1.3 Foundation

The post-installation phase includes tasks that must be performed after installation is complete. Perform these tasks after you have reviewed the installation log files to your satisfaction.

New for SAS 9.1.3 Foundation

SAS Invocation Scripts

SAS is invoked by Bourne Shell scripts located in the `!SASROOT/bin` directory. A SAS invocation script is created for each language installed. The invocation scripts are named using the language codes of the installed language. For example, `sas_en` invokes the English version of SAS 9.1.3 Foundation. See the language codes table on page 43 for a list of all valid language codes.

If more than one language is chosen for installation, you will be asked to choose a “default” language. SAS Setup uses this information to create a symbolic link, `!SASROOT/sas`, to reference the appropriate invocation script in `!SASROOT/bin`. For example, in an English installation, `!SASROOT/sas` would be a symbolic link pointing to the `!SASROOT/bin/sas_en` invocation script.

SAS Configuration Files

SAS 9.1.3 Foundation creates a separate configuration file for each language installed (including English). These language-specific configuration files are `!SASROOT/nls/<lang>/sasv9.cfg` for each respective language. An additional configuration file that is language independent is `!SASROOT/sasv9.cfg`. This master configuration file in `!SASROOT` is used by all languages in addition to the language-specific files in `!SASROOT/nls/<lang>/`. You can modify these configuration files to fit your needs. Refer to the *SAS Companion for UNIX Environments* for more information on how to customize the SAS configuration file.

Beginning with Service Pack 3, the SAS configuration file `sasv9_local.cfg` was added to the `!SASROOT` directory. The purpose of this new SAS configuration file is to allow SAS Administrators to add site-specific configuration options which override the SAS installation default values. This file is left intact during the installation process, so modifications to this file will remain after SAS Service Pack upgrades to the SAS system.

Environment Variable Definition File

SAS 9.1.3 Foundation gives you the ability to customize UNIX environment variables for all SAS sessions by making additions to the `!SASROOT/bin/sasenv_local` file. Refer to “Modifying Environment Variable Settings for SAS 9.1.3 Foundation”, on page 50, for further information.

Making SAS 9.1.3 Foundation Available

Once you have installed SAS 9.1.3 Foundation, you need to make it available to your users. You can use either of the following two methods to accomplish this.

Method 1: Symbolic Link

We recommend using this method in a multi-user environment.

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

```
$ ln -s /usr/local/SAS/SAS_9.1/sas /usr/bin/sas
```

where `/usr/local/SAS/SAS_9.1` is your SASROOT directory and `/usr/bin` is a directory in the users' default search path.

If you have additional SAS invocation scripts you want to make available, you can create symbolic links for them similar to the default invocation script. For example, to make the Italian invocation script available for use, issue a command similar to

```
$ ln -s /usr/local/SAS/SAS_9.1/bin/sas_it /usr/bin/sas_it
```

where `/usr/local/SAS/SAS_9.1` is your SASROOT directory and `/usr/bin` is a directory in the users' default search path. For these additional SAS localizations, you will need to inform your users to execute `sas_it` to access the Italian version of SAS.

Method 2: Startup Script

We recommend using this method only if you have a small number of users.

Edit each user's shell startup script so that the SASROOT directory is included in the search path. For example, for Bourne shell users, change the following line in `$HOME/.profile`:

```
$ PATH=/bin:/usr/bin:/usr/local/bin:.
```

to read:

```
$ PATH=/bin:/usr/bin:/usr/local/bin:/usr/local/SAS/SAS_9.1:.
```

where `/usr/local/SAS/SAS_9.1` is your SASROOT directory.

The above example will only allow users to access the default SAS invocation script. If you would like them to have access to additional localizations, you can also include the `!SASROOT/bin` directory in your above `PATH` designations. Make sure to let your users know the name of the language-specific invocation script to execute.

Defining SAS_ALT_DISPLAY

You may need to define a special environment variable, `SAS_ALT_DISPLAY`, because some server features require a valid X Windows System graphics display. This environment variable will be used to locate a graphics display when the value of the environment variable commonly used by the X Window System, `DISPLAY`, has not been set. The value of `SAS_ALT_DISPLAY` must refer to a display that will always be available during the operation of a SAS server. For example, if the server machine on which SAS servers are running also runs an X server, then set the value of `SAS_ALT_DISPLAY` to the name of the server machine.

To set the SAS_ALT_DISPLAY environment variable, edit the file !SASROOT/bin/sasenv and substitute your display name for `value:0.0` in the line,

```
SAS_ALT_DISPLAY=value:0.0
```

If an X server is not available on the server machine, an alternative is to use the X virtual frame buffer (Xvfb) as supplied by the operating system vendor. Refer to your vendor-supplied documentation for information on the use of Xvfb.

Modifying Environment Variable Settings for SAS 9.1.3 Foundation

SAS installs two types of files that allow environment variable definitions for all SAS sessions. The first file, !SASROOT/bin/sasenv, defines environment variables that SAS 9.1.3 Foundation requires to run properly. User customizations to this file are prohibited.

The second, !SASROOT/bin/sasenv_local, allows SAS Administrators the ability to customize the environment in which SAS runs without modifying global profiles for your operating system or local user startup scripts (such as the \$HOME/.profile in the Bourne shell). Settings found in this file will be added to the environment variables in any user's shell at SAS startup time.

Other noteworthy files installed in !SASROOT/bin are sasenv.ksh, sasenv.csh, sasenv_local.ksh, and sasenv_local.csh. These files are used by SAS Technical Support for debugging purposes only; you should not alter these files unless instructed to do so by Technical Support.

Running SAS 9.1.3 Foundation

When you have completed making SAS 9.1.3 Foundation available for use, you can invoke it from the UNIX command line as follows:

```
$ sas <sas invocation script options> -- <sas options>
```

where `<sas invocation script options>` are valid SAS Invocation Script Options. Refer to “SAS Invocation Scripts” on page 41 for more information on the SAS Invocation Scripts. The following are valid options:

<code>-debug</code>	enables Bourne shell debugging regarding the processing of the SAS invocation script
<code>-noexec</code> <code>-noe</code>	displays the generated SAS command line to be used and does not execute SAS
<code>-sasenv</code>	allows an additional user-customizable environment file to be processed in addition to the installed !SASROOT/bin/sasenv and !SASROOT/bin/sasenv_local files

`<options>` are valid SAS command line options. Refer to your online documentation to find a list of valid SAS command line options.

For example, if a SAS user would like to point to an environment file that defines a set of environment variables to be made available within a SAS session and to also set the SAS system option `-memsize` to have a value of 128 megabytes, one could use the following syntax:

```
sas -sasenv /tmp/sasenv.user -- -memsize 128M
```

Depending on your installation, you may have more than one invocation point available in which to run SAS 9.1.3 Foundation. This can occur if you install NLS localizations or SAS Risk Dimensions. Refer to “Making SAS 9.1.3 Foundation Available” on page 41 for further information on making the additional installations available.

If you install NLS localizations, SAS Setup will create invocation scripts automatically in the !SASROOT/bin directory that will launch SAS 9.1.3 Foundation using the appropriate localizations. For example, the invocation script for the French version of SAS 9.1.3 Foundation is `$ sas_fr`.

Below is a list of the valid languages and language codes.

Language	Code
Chinese (Simplified)	ZH
Chinese (Traditional)	ZT [EUCTW/BIG5]*
Czech	CS
French	FR
French/Canadian	FC
French (Swiss)	FS
German	DE
German (Swiss)	DS
Greek	EL
Hebrew	IW
Hungarian	HU
Italian	IT
Japanese Primary Encoding	JA
Japanese Secondary Encoding	JA [EUC/SJIS]**
Korean	KO
Russian	RU
Spanish (Castilian)	ES
Swedish	SV

* For Chinese Traditional, EUCTW is the primary encoding on Solaris and the secondary encoding on HP-UX. BIG5 is the primary encoding for H64 and the secondary encoding for S64.

** EUC is the Japanese Secondary Encoding for HP-UX and AIX. SJIS is the Japanese Secondary Encoding for Solaris, Tru64 UNIX, and Linux.

In addition, DBCS Asian language support exists for language localizations that require it. If DBCS has been installed, SAS Setup will automatically create an invocation script in the SASROOT directory that will launch SAS 9.1.3 Foundation with DBCS support. Within SASROOT, the invocation script file for DBCS is:

```
$ sas_dbcs
```

Invoking SAS for Secondary Encodings

If you have installed the secondary encoding for Chinese Traditional or Japanese you may invoke them as follows:

If ZT is installed on HP-UX, the script `!sasroot/bin/sas_zt.euc` will be created, and it should be used to run the secondary encoding.

If ZT is installed on Solaris, the script `!sasroot/bin/sas_zt.big5` will be created, and it should be used to run the secondary encoding.

If "Secondary Japanese encoding" is installed on HP-UX or AIX, the script `!sasroot/bin/sas_ja.euc` will be created, and it should be used to run the secondary encoding.

If "Secondary Japanese encoding is installed on Solaris, Tru64 UNIX, or Linux, the script `!sasroot/bin/sas_ja.sjis` will be created, and it should be used to run the secondary encoding.

Note: For Chinese Traditional, if the language is installed, both primary and secondary encodings are automatically made available. For Japanese, the primary and secondary encodings may be selected for installation separately.

Logging SAS Errors

If SAS does not start, the SAS log might contain error messages that explain the failure. However, error messages that SAS issues before the SAS log is initialized are written to the SAS console log. Under UNIX, the STDOUT fileref specifies the location of the console log.

If SAS terminates with errors the SAS log might contain error messages that explain the failure. Any error message that SAS issues before the SAS log is initialized are written to the MSG window if it is available or to the SAS console log, which is a Windows file. Under Windows NT, the SAS console log is located in the `c:\winnt\Profiles\username\Application Data` folder. In all other Windows operating systems, the SAS console log is located in the `c:\Document and Settings\userid\Application Data` folder. You can obtain the filename for the SAS console log from the Application Event Log. To open the application Event Log, submit `eventvwr` from the Run dialog box and click Application.

Accessing a Web Browser

SAS 9.1.3 Foundation requires access to a Netscape Web browser. The Netscape path should be set in each user's `PATH` environment variable, be set in the X Window resource/application default `SAS.helpBrowser`, or be set by choosing the Tools pull-down menu, then the Options menu option, and making changes in the Preferences windows after starting SAS 9.1.3 Foundation.

Refer to the *System Requirements* for the supported versions of Netscape, as well as information for downloading the correct version.

Note: *You may receive authorization failures using Netscape to view ODS output. These failures are corrected by completing the steps in the section "Configuring User Authentication."*

Configuring User Authentication

Certain SAS products and features employ functionality that require SAS to check userid authentication and file access authorizations. This in turn necessitates that certain files within your SAS installation have setuid permissions and be owned by root. Configuring user authentication is required for all users of SAS software. You can perform this task using either of the following methods.

Method 1: Using SAS Setup

1. Log in to the root account.

```
$ su root
```

2. Run SAS Setup from `!SASROOT/sassetup`.
3. Select Run Setup Utilities from the SAS Setup Primary Menu.
4. Select Perform SAS Software Configuration.
5. Select Configure User Authentication.

Method 2: Using the Command Line

Tru64 UNIX

```
$ su root
# cd !SASROOT/utilities/bin
# mv setuid/* .
# chown root elssrv sasauth sasperm
# chmod 4755 elssrv sasperm
# chmod 6755 sasauth
# chgrp auth sasauth
# exit
```

All Other UNIX Platforms

```
$ su root
# cd !SASROOT/utilities/bin
# mv setuid/* .
# chown root elssrv sasauth sasperm
# chmod 4755 elssrv sasauth sasperm
# exit
```

Running SAS/ACCESS Software Configuration

SAS/ACCESS software requires post-installation configuration before you can use the software. Post-installation configuration involves identifying the DBMS version or release you are running for the selected SAS/ACCESS software and setting the shared library path. To identify the DBMS version or release, follow the steps below. To set the shared library path, refer to Chapter 3, “Post-Installation Configuration for SAS/ACCESS Software” in the *Configuration Guide*.

Identifying the DBMS Version

Find out the following information about the DBMS:

- the version or release of the DBMS client libraries installed on your operating system, required due to incompatibilities among DBMS versions or releases, and
- the DBMS root directory of your client install, required so SAS/ACCESS software can find the DBMS shared libraries.

Attention: Refer to the section “Specific Product Requirements” in the *System Requirements* to determine if the DBMS version or release is supported by the SAS/ACCESS software you want to configure.

Furthermore, determine if the combination of your operating system version or release, plus the DBMS version or release is supported by the SAS/ACCESS software you want to configure.

SAS/ACCESS software may require you to choose which DBMS version or release you want to access. To identify the DBMS version or release for your SAS/ACCESS software, follow the steps below:

1. Run `SAS Setup` from `!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`.
3. Select `Perform Product-Specific Configuration`.
4. Select `SAS/ACCESS Configuration`.
5. Select the appropriate SAS/ACCESS software from the selection screen. Answer any questions that SAS Setup asks you. The post-processing will take place immediately and report any errors encountered. Refer to “SAS/ACCESS Software Configuration” in Chapter 2, “Installing SAS 9.1.3 Foundation” for further information.

To complete the final step for SAS/ACCESS software configuration, refer to Chapter 3, “Post-Installation Configuration for SAS/ACCESS Software” in the *Configuration Guide*.

Using SAS/GRAPH Software Map Data Sets

The SAS/GRAPH Map Data Sets provided on the CDs have been compressed to reduce the amount of disk space required to install them. SAS/GRAPH Map Data Sets are loaded in the `!SASROOT/maps` directory and must be uncompressed before you are able to use them.

If you chose to uncompress the maps during installation, they are ready for use now. If you are unsure if the maps were uncompressed during installation, you can check the `!SASROOT/maps` directory for files with a `.Z` extension.

If `.Z` extension files exist, follow the steps below to uncompress them:

1. Run `SAS Setup` from `!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`.
3. Select `Perform SAS Software Configuration`.
4. Select `Uncompress Map Data Sets`.

Customizing Your News File

SAS 9.1.3 Foundation is shipped with a news file whose contents are displayed on every SAS log. This news file is intended for sites to modify and provide site-specific information. To customize the news file, edit `!SASROOT/misc/base/news` and add any information you wish.

You can also disable the displaying of the news file on the SAS log by specifying the `NONEWS` option.

Further Configuration Steps

Some SAS products installed with SAS 9.1.3 Foundation have their own configuration procedures. Please refer to the *Configuration Guide for SAS 9.1.3 Foundation for UNIX Environments* for product-specific post-installation tasks.

Chapter 6 – Maintaining Your SAS 9.1.3 Foundation Installation

This chapter describes tasks you can perform to maintain your SAS 9.1.3 Foundation installation. SAS Setup is automatically loaded along with your SAS 9.1.3 Foundation installation. Use SAS Setup to maintain your installation by choosing the `Run Setup Utilities` option from the SAS Setup Primary Menu. Each utility option available has help associated with it that explains its behavior.

Once SAS 9.1.3 Foundation is installed at your site, you should not directly modify any files in the SASROOT directory. Because the SASROOT files will be overwritten during an update of the installation, any user modifications to files in SASROOT should be duplicated in a location other than SASROOT or the `!SASROOT/nls/en/sascfg` directory. If you update your SAS 9.1.3 installation at a later date, it is your responsibility to take any previously made user modifications and re-integrate them into SAS 9.1.

Renewing SAS Software

SAS 9.1.3 Foundation is licensed on a periodic basis. You will receive new license information whenever you renew your existing SAS 9.1.3 Foundation license or add additional products to your license. The license information you receive is in the form of SAS Installation Data, which includes your SETINIT. You must apply your SAS Installation Data to SAS 9.1.3 Foundation before your licensed software will run.

SAS Installation Data

SAS Installation Data consists of customized installation information and customized product authorization information provided by SAS. SAS will send a Software Order E-mail to the SAS Installation Representative at your site. This Software Order E-mail contains your SAS Installation Data in a text attachment. Instructions in the Software Order E-mail explain where and how to save the text attachment for later use. If you cannot locate the correct SAS Installation Data, you can visit the Web site <http://support.sas.com/adminservices-SID> to have your Software Order E-mail re-sent to the SAS Installation Representative at your site.

Installing Additional Software

Follow the directions in Chapter 2, “Installing SAS 9.1.3 Foundation from the SAS Software Navigator” for instructions on how to install SAS software. After the new software has been installed, follow the instructions in the following section, “Renewing Your Installed SAS Software” to ensure your new products are licensed.

Renewing Your Installed SAS Software

If you just want to renew your license and apply your new SAS Installation Data to your existing SAS installation, follow the steps below:

1. Run SAS Setup from `!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.
3. Select Renew SAS Software.
4. Enter the path of the SAS Installation Data (the saved e-mail attachment) when prompted.
5. Your SAS Installation Data is applied immediately. SAS Setup will report if the task was completed successfully or not. If errors occur, a message is displayed indicating the log files you should check. If the SAS Installation Data applies successfully, you can enter Q to quit SAS Setup and run SAS 9.1.3 Foundation normally.

If you have questions about your SAS Installation Data or encounter problems renewing your license, please refer to the *Service & Support* tab for information on contacting our Customer Service Department and SAS Technical Support.

Modifying Environment Variable Settings for SAS 9.1.3 Foundation

You can customize additional environment variable settings for all SAS sessions by making additions to the `!SASROOT/bin/sasenv` file. The `sasenv` file is created at installation time, and contains settings needed for SAS 9.1.3 Foundation to run properly by default. Additions to this file would allow you to customize the environment in which SAS runs without modifying global profiles for your operating system or local user startup scripts (such as the `$HOME/.profile` in the Bourne shell). Settings found in this file will be added to the environment variables in any user's shell at SAS startup time.

Attention: Use caution when modifying the `sasenv` file. As mentioned above, the default file contains environment variables that are needed for SAS 9.1.3 Foundation to run properly. Do not delete anything from the file without being advised to by SAS Technical Support. Make all additions to the `sasenv` file using Bourne shell syntax.

Regenerating the SAS Invocation Scripts

It is not recommended that you modify the SAS invocations scripts in `!SASROOT/bin`.

SAS Setup allows you to regenerate the default SAS Invocation scripts located in `!SASROOT/bin`.

1. Run SAS Setup from `!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.

3. Select Perform SAS Software Configuration.
4. Select Recreate the SAS Invocation Scripts.

Restoring the Default Configuration File

If you have modified any of the configuration files in !SASROOT or !SASROOT/nls/<lang>, and want to restore the default versions, follow the steps below:

1. Run SAS Setup from !SASROOT/sassetup. Make sure you have the appropriate privilege to update files in !SASROOT and !SASROOT/nls.
2. Select Run Setup Utilities from the SAS Setup Primary Menu.
3. Select Perform SAS Software Configuration.
4. Select Create SAS Config Files.

Listing Installed SAS Software

To list all SAS software installed in the current SAS installation, follow the steps below:

1. Run SAS Setup from !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.
3. Select List Previously Installed Software.

Integrating with a SAS Open Metadata Server

To optionally integrate your SAS 9.1.3 Foundation installation with a SAS Open Metadata Server, follow the steps below:

1. Run SAS Setup from !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.
3. Select Perform SAS Software Configuration.
4. Select Integrate with SAS Open Metadata Server.

5. Answer a series of prompts for information about integrating with a SAS Open Metadata Server.

- a. In order to integrate with an existing SAS Open Metadata Server, you must specify the fully qualified machine name of the machine where the SAS Open Metadata Server exists. If you are not sure what the fully qualified machine name is, you can open a separate process or window to find it. You can also enter an exclamation (!) mark to start a sub-process and search for the fully qualified machine name.

```
Enter the fully qualified machine name of the SAS Open Metadata Server on the network.  
-->
```

- b. You must enter the port number you will use to communicate with the SAS Open Metadata Server.

```
Enter the Port number for communicating with the SAS Open Metadata Server.  
-->
```

- c. You must enter the name of the SAS Open Metadata Server you will be integrating with.

```
Enter the SAS Open Metadata Server Repository Name. This identifies the  
Repository to use for storing information about this SAS installation.  
-->
```

- d. You must create a default User ID and Password to use when connecting to the SAS Open Metadata Server.

```
Enter the default Metadata User ID to connect to the SAS Open Metadata Server  
from this SAS installation.  
-->
```

```
Enter the Metadata Server Password for your default User ID.  
-->
```

Running Technical Support Tools

Included in the Setup Utilities is an option to run Technical Support Tools. This option allows you to run tools that can assist you and SAS Technical Support in determining the state of your system and SAS 9.1.3 Foundation installation. To access the Technical Support Tools, follow the steps below:

1. Run SAS Setup from `!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.
3. Select Run Technical Support Tools.
4. Select the tool you want to run. Your selection is executed immediately and the results presented on the screen and saved to log files. You may choose to run as many tools as you want.

elsconf Configuration Test

SAS 9.1.3 Foundation has a "launch server" which requires that your UNIX operating system to have STREAMS enabled. We recommend that you run the `elsconf` utility to determine if the launch server has been installed correctly, and if the system is configured correctly to support the use of this server. The return code of this program indicates if the configuration is correct, or if not what is wrong.

Usage: `elsconf [-v]`

Run `elsconf` from the `!SASROOT/utilities/bin` directory. Use the `-v` option to display a message describing the error returned from `elsconf`.

The return code is interpreted as a set of bit fields as follows:

`ELSSRV_CANNOT_TRANSFER_FD` 0x1

This indicates that the system does not have STREAMS configured correctly so that the `elssrv` can transfer file descriptors to the new program.

Error Message:

```
ERROR: Your Operating System is not configured for STREAMS which is
a requirement to run the SAS System for UNIX. Please
reference your SAS Systems Requirements Documentation for
your vendor, at http://support.sas.com/installcenter,
for information on how to determine if STREAMS are enabled
and how to configure your operating system for STREAMS.
```

Good Message:

```
NOTE: Your Operating System is configured correctly to support the
SAS Launch Service.
```

`ELSSRV_NOT_SETUID_ROOT` 0x2

This indicates that the `elssrv` is not SETUID Root, which is required in order to launch a program under a different user ID than the current user id.

```
Error Messages:      Error: ./elssrv is not SETUID.
                    Error: ./elssrv is not owned by Root.
```

ELSSRV_NOT_EXECUTABLE 0x4

Error Message: ERROR: ./elssrv is not Executable

ELSSRV_NOT_FOUND 0x8

Error Message: Error: ./elssrv cannot be found

If the return code is zero, then everything passed correctly.

Moving SAS 9.1.3 Foundation to Another Location

If you need to move your installed SAS 9.1.3 Foundation to another disk location on your system, follow the steps below. Note that these steps are only for SAS Foundation and cannot be applied to SAS applications not included in SAS Foundation.

1. Make a backup of your system.
2. Identify the target directory where you want to move SAS 9.1.3 Foundation and make sure there is adequate free disk space.
3. Copy the entire contents of your installed SAS 9.1.3 Foundation to the new target directory. This can be performed in different ways; however, you need to retain permissions and links. We recommend either of the following methods:

Create a tar file containing the entire contents of your SAS 9.1.3 Foundation installation:

```
$ tar cf sas.tar sasroot
```

where *sasroot* refers to the root directory of your existing SAS 9.1.3 Foundation installation and *sas.tar* refers to the tar file you create.

Unpack the tar file in the desired target directory:

```
$ cd target
$ tar xf sas.tar
```

where *target* refers to the new target directory for SAS 9.1.3 Foundation and *sas.tar* refers to the tar file you created containing SAS 9.1.3 Foundation.

Example: Using the tar command to move SAS 9.1.3 Foundation from /usr/local/SAS_9.1 to /disk1/local/SAS_9.1:

```
$ cd /usr/local
$ tar cf /disk1/local/sas9.1.tar ./SAS_9.1
$ cd /disk1/local
$ tar xf sas91.tar
```

Or, you can combine these steps into a single command:

```
$ tar cf - sasroot | (cd target && tar xf -)
```

Example:

```
$ cd /usr/local
$ tar cf - ./SAS_9.1 | ( cd /disk1/local; tar xf -)
```

4. Use SAS Setup to adjust those places within the new copy of SAS where it refers to its own location. To do this:
 - Run SAS Setup (`sassetup`) from the new SASROOT. Ensure you have the appropriate permissions to update files in the new SASROOT.
 - Select Run Setup Utilities from the SAS Setup Primary Menu.
 - Select Perform SAS Software Configuration.
 - Select Adjust SAS to Run in New Location.
 - SAS Setup will ask you to confirm, or change, the paths to both the new and old locations.

SAS Setup will report which files were changed, and whether any errors were encountered.

5. Invoke SAS 9.1.3 Foundation and make sure it works properly from the new target directory.
6. When satisfied that SAS 9.1.3 Foundation runs properly, you can remove the prior version.

If you encounter problems moving SAS 9.1.3 Foundation to another disk location, you can always re-install SAS 9.1.3 Foundation from CDs into the new target directory. With this option, you will have to remake any modifications you made to your existing SAS 9.1.3 Foundation installation.

Restoring Backed-up Files

SAS Setup automatically backs up several files that tend to be modified. You can see what files are backed up by looking in `!SASROOT/install/admin/backups`. If you need to restore one of these files, simply find where the file exists and copy it to the proper location. For example, if you wish to restore a prior copy of your configuration file, enter the following command:

```
$ cd !SASROOT
$ cp ./install/admin/backups/sasv9.cfg_031215.000 sasv9.cfg
```

When upgrading your SAS Foundation installation, SAS Setup backs up several files that tend to be modified and directories that contain files that tend to be modified. The backed up files and directories will reside in `!SASROOT/install/upgrade_<date stamp>###` when the install completes.

Uninstalling SAS Software

You can uninstall SAS 9.1.3 Foundation by deleting all the files within the SASROOT directory. In addition, you will need to delete the `.sasprefs` file located in the home directory of the user that performed the install. Deleting the SASROOT directory will also delete your installed copy of the SAS Private JRE, unless you were using a JRE from another SAS 9.1.3 Foundation install. Deleting the `.sasprefs` file also removes the reference to the installed JRE, and to the SASROOT itself.

You should not delete a SASROOT directory of a SAS 9.1.3 Foundation if there is another SAS 9.1.3 Foundation installation on the same machine that depends on the JRE in the original SASROOT. Whether or not there is a dependency can be determined by checking the contents of the `.sasprefs` file of the installation in question to obtain the directory path of the JRE that is being used.

You cannot uninstall SAS software individually because SAS software integrates with other SAS software when it is installed. If you want to disable the use of particular software, you should request a different SETINIT file from SAS and apply it to your installed SAS 9.1.3 Foundation.

Glossary

- **.sasprefs file**
A text file created in \$HOME of the id performing the SAS 9.1.3 foundation containing information about the install, e.g. the location of !SASROOT or the JRE.
- **Automatic Post-Processing**
An installation phase where specific configuration tasks are performed by SAS Setup.
- **Bourne sub-shell**
A Bourne sub-shell is a separate process that inherits characteristics from its parent process, such as user name, file protection, permissions, etc.
- **CD Set**
The set of CDs that make up your software order.
- **Configuration File**
A file containing SAS 9.1.3 Foundation options that alter the default behavior of SAS 9.1.3 Foundation. A configuration file is created during installation of SAS 9.1.3 Foundation in !SASROOT/sasv9.cfg.
- **DBCS**
Double-byte character set support in SAS 9.1.3 Foundation.
- **History File**
Control file used by SAS Setup containing a history of what components have been installed.
- **Hotfix**
A replacement file that fixes a specific problem in SAS 9.1.3 Foundation. Hotfix files can be downloaded from the Technical Support Web site.
- **Install Center Web site**
A Web site located on SAS's external site that always has the latest release documentation available for download. Located at <http://support.sas.com/documentation/installcenter/913/kit/index.html>.
- **Installation Kit**
The Installation Kit contains the installation components of your software order. It contains the *SAS Order Information Letter*, *System Requirements*, *Alert Notes*, *Installation Instructions*, *Configuration Guide*, and installation CDs.
- **Invocation point**
A file that launches an application. For example, the primary invocation point for SAS 9.1.3 Foundation is !SASROOT/sas.

- **Localization**
The translation of SAS 9.1.3 Foundation into languages local to a country or region.
- **Mount point**
A local directory that references a mounted CD.
- **National Language Support (NLS)**
Localized components of SAS 9.1.3 Foundation for various languages. National Language Support for SAS 9.1.3 Foundation does not include installation messages, which are always presented in English.
- **Order Number**
A number associated with your software order and used as input for downloading your current SAS Installation Data. Your Order Number is printed on the *SAS Order Information Letter* in your Installation Kit, as well as included in the Software Order E-mail sent to the SAS Installation Representative at your site.
- **Root account**
The root account on UNIX is required to manually mount and unmount CDs.
- **SAS 9.1.3 Foundation**
The combination of Base SAS 9.1.3 and the server-side products you have ordered that are installed at the same time as Base SAS 9.1.3.
- **SAS account**
The account on UNIX that should be used for software installation.
- **SAS Installation Data**
Data customized specifically for your site used to install and run SAS 9.1.3 Foundation. You obtain your SAS Installation Data as an attachment to your Software Order E-mail.
- **SAS Installation Key**
The key assigned to your site that enables secure access to the Internet to download your current SAS Installation Data. Your SAS Installation Key is printed on the *SAS Order Information Letter* in your Installation Kit, as well as included in the Software Order E-mail sent to the SAS Installation Representative at your site.
- **SAS Installation Representative**
The person responsible for installing and maintaining SAS software for UNIX systems at your site.
- **SAS Private JRE**
A fully functional Java Runtime Environment, excluding the cryptography extension jars, that has been validated to work with SAS 9.1.3 products and is provided by the SAS 9.1.3 Foundation install. The version varies across the supported UNIX operating systems.
- **SAS Setup**
The application used to install and maintain SAS 9.1.3 Foundation. SAS Setup is supplied on the *SAS Setup Disk*, as well as installed along with SAS 9.1.3 Foundation.

- **SAS Software Depot**
A networked copy of your SAS media, accessed and created by the SAS Software Navigator.
- **SAS Software Navigator**
A tool for connecting the various pieces of high-level solutions and product offerings throughout your installation.
- **sasenv file**
This file allows you to customize UNIX environment variable definitions for your site.
- **SASROOT**
The root directory of SAS 9.1.3 Foundation where all SAS files and subdirectories are loaded, also referred to as !SASROOT.
- **SETINIT**
The SETINIT is supplied by the SAS Contracts Division and is used to authorize SAS 9.1.3 Foundation at your site. The SETINIT is delivered as part of the SAS Installation Data.
- **Shared Library Path**
SAS 9.1.3 Foundation uses your shared library path to access executables for other third-party software. For example, if you have Oracle installed on your Solaris system, SAS/ACCESS Interface to Oracle software uses the shared library path LD_LIBRARY_PATH to access Oracle files.
- **Software Order E-mail**
An e-mail message sent by SAS to the SAS Installation Representative that includes your SAS Installation Data, your SAS Installation Key and Order Number, and a list of SAS Software licensed by your site.
- **Software Updates**
Replacement file containing fixes and enhancements to SAS 9.1.3 Foundation. Software updates are included in your Installation Kit when appropriate.
- **Symbolic Link**
A link to an existing file or directory. Once created, you can manipulate the link as if it were the original file. Symbolic links are created using the `ln -s` command.
- **Target Directory**
The directory location where you intend to install SAS 9.1.3 Foundation. This is also referred to as SASROOT.
- **TOC File**
Control file used by SAS Setup as an index of installable components.
- **TS Level**
The Technical Support level assigned to a given release of SAS 9.1.3 Foundation.



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