

# System Requirements for SAS<sup>®</sup> 9.3 Foundation for AIX<sup>®</sup>



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## Overview

This document provides requirements for installing and running SAS 9.3 Foundation for AIX. You must update your system to meet the minimum requirements before running SAS 9.3 Foundation. The major requirements listed in the document are:

- Software Requirements
- Hardware Requirements
- Space Requirements
- Specific Product Requirements
- Graphics Hardware and Software Compatibility

## Software Requirements

### *Operating System*

SAS 9.3 is supported on the following versions of AIX:

- release 6.1 TL4
- release 7.1

SAS 9.3 is a 64-bit application and requires 64-bit environment (hardware and operating system support) in order to execute.

In addition, for all versions of AIX, you must apply the runtime package. The following versions are acceptable: V10.1.0, V11.1, or later.

SAS will run on AIX using either the 32 or 64-bit kernel; however, the 64-bit kernel is recommended so that you may take advantage of the full functionality of SAS software. You should use the 32-bit kernel only if you are using third-party software that requires it. Furthermore, if your installation uses Platform Process Manager from Platform Computing, you will need to configure your AIX system to use the 64-bit kernel. The direct usage of Platform Process Manager is with the Scheduler Manager plug-in of the SAS Management Console.

To determine what kernel type your AIX system is running, perform the following command:

```
/usr/sbin/lscconf -k
```

If your kernel type is 32-bit, the output will be `Kernel Type: 32-bit`. Similarly, if your kernel type is 64-bit, the output will be `Kernel Type: 64-bit`. If the output indicates a 32-bit kernel, please refer to your systems documentation or contact your systems administrator to change to a 64-bit kernel.

SAS requires the file systems where SAS is installed to have the `setuid` mount option enabled because `sasauth`, `sasperm`, and `elssrv` require it at SAS run time.

In UNIX environments, the SAS BASE (V9) engine requires a POSIX-compliant file system. Consult the vendor for confirmation that the file system you are considering has been certified POSIX-compliant.

## Operating System Tuning Guidelines

For information about tuning your AIX operating system for optimum performance of SAS 9.3, refer to *Installation Note 43821: Tuning guidelines for SAS on AIX* at <http://support.sas.com/kb/43/821.html>.

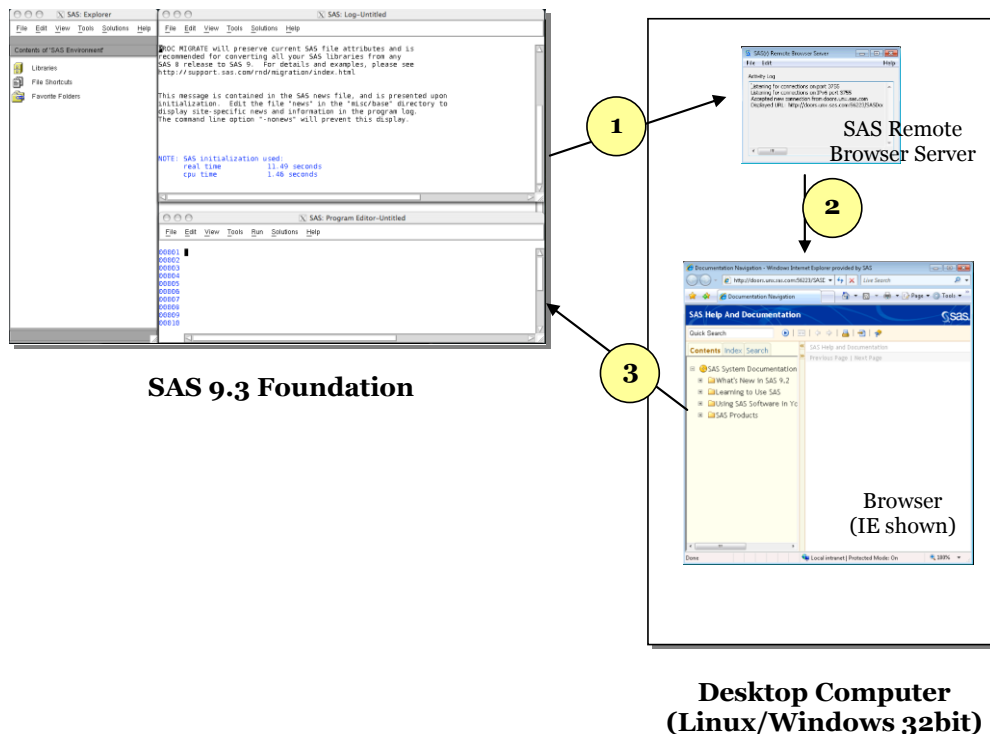
## Java Requirements

For information about Java Runtime Environment (JRE) requirements, refer to the SAS 9.3 Support for Java Runtime Environments Web page, located at <http://support.sas.com/resources/thirdpartysupport/v93/jres.html>.

## Web Browser

SAS 9.3 Foundation uses remote browsing to display Web-based information. Instead of running a browser on the UNIX workstation, SAS 9.3 Foundation sends the URL to your desktop computer for display in a Web browser. This removes the browser overhead from the UNIX server. A small software agent named the Remote Browser Server is installed on your desktop computer to enable SAS to communicate with your browser.

SAS creates a URL that references the information to be displayed (usually program help or ODS output), then sends the URL to the SAS Remote Browser Server on your desktop computer (step 1). The Remote Browser Server then sends a request to the browser to display a page (step 2). The browser then reconnects to SAS to retrieve the information to be displayed and displays it in the browser (step 3).



To use remote browsing, your desktop computer must have one of the following platforms, and have installed one of the supported browsers.

Platform	Supported Browser
Windows XP/Vista/7 32-bit and 64-bit	Firefox 3.6
	Internet Explorer 7 or Internet Explorer 8
Linux 32-bit and 64-bit	Firefox 3.6

The Remote Browser Server must be installed and running for SAS to display web information. The installer for the Remote Browser Server can be found at <http://www.sas.com/apps/demosdownloads/setupintro.jsp>, or directly downloaded from a SAS session.

For SAS to be able to use your web browser, the browser must be configured to allow pop-up windows.

## Hardware Requirements

### ***Machines Supported***

SAS 9.3 can be installed on all machines that support AIX, Release 6.1 or higher for 64-Bit Power CPUs or RS64 architectures.

To verify that you are using a 64-bit Power processor, enter the following command:

```
$ lsconf | egrep 'Processor Type|CPU Type'
```

The response will be in the following format:

```
Processor Type: xxx  
CPU Type: xxx
```

If the Processor Type field contains a reference to a Power CPU (for example, `PowerPC_POWER4`), the CPU Type must be 64-bit in order to use a Power CPU.

### ***Distribution Media***

- Electronic Software Delivery
- DVD

### ***Memory Requirements***

For general SAS activities (for example, query and reporting, simple statistics, data manipulation), we recommend 96 MB per user.

More memory is needed for memory-intensive tasks such as OLAP, data mining, heavy statistical analysis, multivariate analysis, formats, and any GUI-based applications. Please see the Specific Products Requirements section for more details on memory requirements for specific products.

### ***Supported Displays***

All X11-based display servers are supported. Monitors must support a minimum of 256 colors (PseudoColor).



## Space Requirements

The following list contains space requirements in MB for all of the products available with this release of SAS 9.3 Foundation for AIX. Use this information to help you determine how much free disk space you must have available before you can install SAS 9.3 Foundation. In addition, SAS 9.3 Foundation requires approximately 30 MB of disk space on the `/tmp` partition to complete the installation.

Software Product	Required Disk Space (MB)
Base SAS software	690
Base SAS Versioned JAR Repository	189
ODS Templates software	183
Report Fonts for Server software	370
SAS Data Quality Server software	45
SAS High-Performance Forecasting software	24
SAS Installation and Qualification Verification software	1
SAS Integration Technologies software	11
SAS Integration Technologies Versioned JAR Repository	96
SAS OLAP Server software	4
SAS/ACCESS Interface to DB2 software	1
SAS/ACCESS Interface to Greenplum software	59
SAS/ACCESS Interface to HP Neoview software	1
SAS/ACCESS Interface to Informix software	1
SAS/ACCESS Interface to Microsoft SQL Server	23
SAS/ACCESS Interface to MySQL software	1
SAS/ACCESS Interface to Netezza software	1
SAS/ACCESS Interface to ODBC software	2
SAS/ACCESS Interface to Oracle software	1
SAS/ACCESS Interface to PC Files software	4
SAS/ACCESS Interface to R/3 software	5
SAS/ACCESS Interface to Sybase software	1
SAS/ACCESS Interface to Sybase IQ software	1
SAS/ACCESS Interface to Teradata software	1
SAS/AF software	11
SAS/ASSIST software	22
SAS/CONNECT software	3
SAS/EIS software	31
SAS/ETS software	98
SAS/FSP software	2
SAS/Genetics software	13
SAS/GIS software	52
SAS/GRAPH software	412*
SAS/IML software	16
SAS/INSIGHT software	16
SAS/IntrNet software	3
SAS/LAB software	13
SAS/OR software	63
SAS/QC software	57
SAS/SECURE 168-bit software	1
SAS/SECURE SSL software	4
SAS/SHARE software	1

Software Product	Required Disk Space (MB)
SAS/STAT software	213
SAS/TOOLKIT software	2
SAS/Warehouse Administrator software	46

\*Beginning with the first maintenance release of SAS 9.3 in December 2011, SAS/GRAPH also includes new map data sets from GfKGeoMarketing. SAS/GRAPH now requires 1.3 GB of disk space in addition to the total listed above.

## Specific Product Requirements

### **Base SAS Software**

#### **Requirements for SPD Engine on AIX**

- An SMP (symmetric multiprocessing) computer with at least two CPUs; four are preferred
- At least one I/O channel per two CPUs
- Enough disk drives to have at least one mount point per CPU isolated on its own disk; two mount points per CPU are better

### **SAS Analytics Accelerator for Teradata Software**

The SAS Analytics Accelerator for Teradata requires Base SAS, SAS/ACCESS Interface to Teradata, and at least one of the following products:

- SAS/ETS
- SAS/STAT
- SAS Enterprise Miner

#### **In-Database DBMS Products Required**

All SAS Analytics Accelerator 2.1 for Teradata in-database functions require Teradata 13.00.00.15 or higher. SAS Analytics Accelerator for Teradata also requires Teradata Tools and Utilities (TTU) 13 with patch 1.9 or later.

### **SAS High-Performance Forecasting 12.1 Software**

Base SAS is required for the installation of SAS High-Performance Forecasting software.

### **SAS Scoring Accelerator for DB2 Software**

The SAS Scoring Accelerator for DB2 requires Base SAS, SAS/STAT, SAS/ACCESS Interface to DB2 and SAS Enterprise Miner.

#### **In-Database DBMS Products Required (Function-based Architecture)**

- IBM DB2 9.5 FixPack 3: AIX 5.3 or IBM DB2 9.5 FixPack 3: Linux for x64: Red At Enterprise Linux 4
- Client utilities for IBM DB2 9.5

You will need to have a current version of the IBM XLC compiler installed on the DB2 server that you will be publishing scores to. Contact your IBM/DB2 representative to obtain the appropriate compiler for your DB2 installation.

#### **In-Database DBMS Products Required (SAS Embedded Process-based Architecture)**

- IBM DB2 9.7 FixPack 5 or higher
- Client utilities for IBM DB2 9.7 or higher

The following are the operating system version requirements for the database.

**AIX:**

- AIX 5.3 + TL09
- AIX 6.1 + TL02 or higher
- AIX 7.1 GA + SP3

**Linux:**

- SUS Linux Enterprise Server 10 + SP2
- SUSE Linux Enterprise Server 11

## **SAS Scoring Accelerator for Greenplum Software**

The SAS Scoring Accelerator for Greenplum requires Base SAS, SAS/STAT, SAS/ACCESS Interface to Greenplum, and SAS Enterprise Miner.

The following are the minimum Greenplum database requirements:

- GPDB 4.2.2.0
- GPPC 1.1.0.0

The following are the minimum Linux operating system version requirements for the database:

- Red Hat Enterprise Linux 64-bit 5.5, 5.6, 5.7, 6.1, and 6.2
- SUSE Linux Enterprise Server 64-bit 10 SP4, and 11 SP1

## **SAS Scoring Accelerator for Netezza Software**

SAS Scoring Accelerator for Netezza requires Base SAS, SAS/STAT, and SAS/ACCESS Interface to Netezza. It also requires SAS Enterprise Miner.

**In-Database DBMS Products Required**

- Netezza Performance Data Server 5.0
- Client utilities for Netezza 5.0

## **SAS Scoring Accelerator for Oracle Software**

SAS Scoring Accelerator for Oracle requires Base SAS, SAS/STAT, SAS/ACCESS Interface to Oracle, and SAS Enterprise Miner.

**In-Database DBMS Products Required (SAS Embedded Process-based Architecture)**

- The minimum required Oracle Server version is 11gr2.
- The minimum required Oracle Client release is Oracle, Release 10g (64-bit libraries).

The following are the minimum Linux operating system version requirements for the database:

- Red Hat Enterprise Linux 5.5
- Oracle Enterprise Linux 5.5

In addition, the server must have patches for the following Oracle bugs installed:

- Bug 11678127 - OCIDESCRIBEANY RETURNS ORA:24323 FOR AN OBJECT TYPE USE CASE
- Bug 12536287 - ODCITABLECLOSE NOT INVOKED FOR PARALLEL ENABLED TABLE FUNCTIONS –
- Bug 13533487 - ODCITABLECLOSE NOT INVOKED WHEN CTRL-C IS INVOKED BY QC IN TABLE FUNCTIONS
- Bug 12974145 - UNSET LENGTH OFFSET FIELD IN PEFMARG CAUSES CRASH IN SPEFM\_FIXUP\_LIST
- Bug 11772740 - CALLING OCIRESET() TO ABORT A PIECEWISE CYCLE SEVERS THE ORACLE CON

When this document was published, patches for the following Oracle bugs were not available:

- Bug 12658656 - DUPLICATE SYMBOLS in EXTPROC/AGENT
- Bug 12904682 - CORE DUMP IN MUTEX ACQUIRE WHEN DIAG INITIALIZATION FAILS
- Bug 12904657 - ADR INITIALIZATION FAILS IN SOME EXTPROC THREADS

Until patches can be applied for *all* three of these bugs, you *must* add the following line to \$ORACLE\_HOME/network/admin/sqlnet.ora. No restart is required.

```
DIAG_ADR_ENABLED=OFF
```

## **SAS Scoring Accelerator for Teradata Software**

The SAS Scoring Accelerator for Teradata requires Base SAS, SAS/STAT, SAS/ACCESS Interface to Teradata, and SAS Enterprise Miner. To publish the model to the database, it also requires a SAS code interface or SAS Model Manager.

### **In-Database DBMS Products Required (Function-based Architecture)**

- Teradata 12.0 or higher
- Client utilities for Teradata (12 or higher)

### **In-Database DBMS Products Required (SAS Embedded Process-based Architecture)**

- Teradata 13.10.02.01 or higher
- Client utilities for Teradata (13 or higher)

## **SAS/ACCESS Interface to DB2 Software**

Base SAS is required for the installation of SAS/ACCESS Interface to IBM DB2 software.

### **Products Included:**

- SAS/ACCESS Interface to DB2 software
- SAS Accelerator Publishing Agent software

**DBMS Product Required:** IBM DB2 Universal Database, Version 8.1 FixPak 18 or higher (64-bit libraries)

SAS/ACCESS Interface to DB2 can be installed on a DB2 server or on a DB2 client node with an installation of the DB2 Run-Time Client, DB2 Application Development Client, or DB2

Administration Client. In addition, DB2 Connect must be installed to connect to DB2 databases that reside on AS/400, VSE, VM, MVS, and z/OS systems.

## **SAS/ACCESS Interface to Greenplum Software**

Base SAS is required for the installation of SAS/ACCESS Interface to Greenplum software.

SAS/ACCESS Interface to Greenplum requires the DataDirect Driver Manager and Driver for Greenplum. You must install these components before using SAS/ACCESS Interface to Greenplum. During installation, the SAS Deployment Wizard will ask for the location of these components.

## **SAS/ACCESS Interface to Hadoop Software**

Base SAS is required for the installation of SAS/ACCESS Interface to Hadoop software.

### **Hadoop Components Required**

- Hadoop 0.20.204 or later, for Cloudera CDH3u2 and later
- Hive 0.7.1 or later, including patch HIVE-2315
- Hive JDBC Driver 0.7.1 or later, including patches HIVE-1815 and HIVE-2315

**Hadoop Components Recommended:** JDBC driver patch HIVE-2137

### **Hive Patch Notes**

1. If you run Cloudera Hadoop, Cloudera CDH3u2 and later already contain required patches HIVE-1815 and HIVE-2315. Recommended patch HIVE-2137 is not included in CDH3u2.
2. HIVE-2315 is both a server and client-side patch. It must be installed on your Hadoop server and on your SAS machine or machines.
3. HIVE-1815 and HIVE-2137 are client-side patches and should be installed only on your SAS machine or machines.

## **SAS/ACCESS Interface to HP Neoview Software**

### **Products Required:**

- Base SAS software
- SAS/ACCESS Interface to HP Neoview software
- Neoview ODBC driver, release 2.2 or later

**Note:** *The HP Neoview ODBC driver may require additional operating system libraries, libgcc version 3.4.3 or later and libstdc++ 6.0 or later. Please contact HP Neoview for details.*

SAS/ACCESS Interface to HP Neoview requires an ODBC driver from HP. To get the driver, go to <http://software.hp.com> and click "HP Neoview Platform" under "Our top featured products."

## **SAS/ACCESS Interface to Informix Software**

Base SAS is required for the installation of SAS/ACCESS Interface to Informix software.

**DBMS Product Required:** Informix Client SDK 2.90FC1 (64-bit libraries)

SAS/ACCESS Interface to Informix uses an ODBC connection. The ODBC driver included with Informix Connect must be installed and configured prior to using the SAS/ACCESS to Informix software.

SAS/ACCESS Interface to Informix software also requires the use of communication protocols such as TCP/IP to function properly.

## **SAS/ACCESS Interface to Microsoft SQL Server Software**

Base SAS is required for the installation of SAS/ACCESS Interface to Microsoft SQL Server software.

### **DBMS Product Required**

Microsoft SQL Server Version 7.0 or later

## **SAS/ACCESS Interface to MySQL Software**

Base SAS is required for the installation of SAS/ACCESS Interface to MySQL software.

### **DBMS Products Required**

- MySQL Client 5.1
- MySQL Server 5.0 or later

For more information about SAS/ACCESS Interface to MySQL software, please see the MySQL chapter in *SAS/ACCESS Software for Relational Databases: Reference*.

## **SAS/ACCESS Interface to Netezza Software**

Base SAS is required for the installation of SAS/ACCESS Interface to Netezza software.

### **Products Included:**

- SAS/ACCESS Interface to Netezza software
- SAS Accelerator Publishing Agent software

SAS/ACCESS Interface to Netezza requires an ODBC driver from Netezza. To get the Netezza ODBC driver, release 3.1.4 or above, please contact Netezza technical support at (877) 810-4441 or visit the Netezza customer support Web site, <http://www.netezza.com/support/login.cfm>.

## **SAS/ACCESS Interface to ODBC Software**

Base SAS is required for the installation of SAS/ACCESS Interface to ODBC software.

**DBMS Product Required:** A compliant ODBC driver manager and ODBC driver (64-bit libraries)

ODBC drivers are often available from DBMS vendors and other third party ODBC driver developers. The ODBC driver you choose may require additional DBMS software in order to access the data.

You may have to edit the `odbc.ini` file in your home directory with a text editor to configure data sources. Some ODBC driver vendors may allow a system administrator to maintain a centralized copy by setting an environment variable.

The ODBC drivers are ODBC API-compliant dynamic link libraries, referred to in UNIX as shared objects. You must include the full path to the dynamic link libraries in the OS load library

environment variable, i.e. LD\_LIBRARY\_PATH, LIBPATH, or SHLIB\_PATH so that the ODBC drivers can be loaded dynamically at run time.

For more information, consult your ODBC driver vendor.

## **SAS/ACCESS Interface to Oracle Software**

Base SAS is required for the installation of SAS/ACCESS Interface to Oracle software.

### **DBMS Products Required**

SAS/ACCESS Interface to Oracle software can be installed on either a full Oracle RDBMS server node or on an Oracle client node.

The minimum required Oracle Client release is Oracle, Release 10g (64-bit libraries).

**Note:** *In order to use the Bulk Load feature of this SAS product, you must have Oracle's SQL\*Loader data-loading utility installed. This utility can be obtained by running the Oracle installer and selecting the Oracle Utilities product. Please refer to your Oracle documentation for information on SQL\*Loader.*

## **SAS/ACCESS Interface to PC Files Software**

Base SAS is required for the installation of SAS/ACCESS Interface to PC Files software.

**Product Required on Windows:** SAS PC Files Server, running in either 32-bit or 64-bit to match the ACE driver on that machine.

**DBMS Product Required on Windows:** Microsoft Office 2007 or above System Driver: Data Connectivity Components (ACE)

SAS/ACCESS Interface to PC Files software supports access to delimited files (csv, tab), dBase files (.dbf), JMP files (.jmp), SPSS files (.sav), Stata files (.dta), Excel files (.xls), Microsoft Access database files (.mdb or .accdb) and virtually any data source through ODBC support on Windows.

However, to access Microsoft Access database files (.mdb or .accdb), Microsoft Excel workbook files (.xls, .xlsb, .xlsm or .xlsx) or any ODBC supported data sources, SAS/ACCESS Interface to PC Files software requires the PC Files Server (pcfserver.exe or pcfservice.exe) running on Windows.

## **SAS/ACCESS Interface to Sybase Software**

Base SAS is required for the installation of SAS/ACCESS Interface to Sybase software.

**DBMS Products Required:** Sybase Open Client SDK (Software Developers Kit) Software, Release 12.5.2 or later (64-bit libraries)

**Note:** *SAS/ACCESS Interface to Sybase software no longer supports access to Microsoft SQL Server data. SAS/ACCESS Interface to Sybase software uses the CTLIB API calls to access the Sybase DBMS product. These CTLIB API calls are not supported by Microsoft SQL Server; therefore, you will have to use SAS/ACCESS Interface to Microsoft SQL Server software with an appropriate ODBC driver to obtain access to Microsoft SQL Server data.*

**Note:** *Sybase IQ is not supported; SAS/ACCESS Interface to Sybase IQ software must be used instead.*



## **SAS/ACCESS Interface to Sybase IQ Software**

Base SAS is required for the installation of SAS/ACCESS Interface to Sybase IQ software.

SAS/ACCESS Interface to Sybase IQ requires an ODBC driver (64-bit version) from Sybase. The Sybase IQ ODBC driver is included in the Sybase IQ Network Client. To obtain the Sybase IQ Network Client, release 15.1 ESD#3 and above, please contact your database administrator or Sybase technical support at 1-800-8-SYBASE.

## **SAS/ACCESS Interface to Teradata Software**

Base SAS is required for the installation of SAS/ACCESS Interface to Teradata software.

### **DBMS Products Required**

The following Teradata Client software is required:

- Teradata Database 12 or higher (Teradata Database 13.10 or higher if Temporal features are needed)
- Teradata CLIv2 client libraries, TTU 12 or later for AIX (64-bit libraries) (TTU13.10 or higher if Temporal features are needed)

The following are recommended:

- Teradata FastExport utility, TTU 12 or later for AIX.
- Teradata MultiLoad utility, TTU 12 or later for AIX.
- Teradata Parallel Transporter API, TTU 12 or later for AIX.

## **SAS/AF Software**

### **Products Required for Build Mode**

- Base SAS software
- SAS/AF software
- SAS/GRAPH software (to create and display some graphics objects)

Other products may be required depending on the application.

### **Products Required for Run Mode**

- Base SAS software
- SAS/GRAPH software (to display some graphics objects)

Other products may be required, depending on the application.

### **Printers**

- A color or gray-scale printer is required for printing graphics-based objects.
- Certain non-graphic objects may require SAS/GRAPH software to print, depending on the object.

## **SAS/EIS Software**

### **Products Required for Build Mode**

- Base SAS software
- SAS/AF software
- SAS/EIS software
- SAS/FSP software
- SAS/GRAPH software

Other products may be required, depending on the application.

### **Products Required for Run Mode**

- Base SAS software
- SAS/GRAPH software
- SAS/EIS software

Other products may be required, depending on the application.

### **Memory**

- 96 MB required per concurrent user
- 128 MB recommended per concurrent user

### **Printers**

For printing graphics-based objects, a color or gray-scale printer is required.

## **SAS/Genetics 12.1 Software**

Base SAS and SAS/GRAPH are required for the installation of SAS/Genetics software.

## **SAS/GIS Software**

### **Products Required for Build Mode**

- Base SAS software
- SAS/AF software
- SAS/GIS software
- SAS/GRAPH software

Other products may be required, depending on the application.

### **Products Required for Run Mode**

- Base SAS software
- SAS/FSP software
- SAS/GIS software
- SAS/GRAPH software

Other products may be required, depending on the application.

## **Printers**

A color or gray-scale printer is required. The list of possible printers can be found in the “Graphics Hardware and Software Compatibility” section.

## **SAS/IntrNet Software**

SAS/IntrNet software consists of several components that may be installed independently. SAS/IntrNet Server software is installed on an existing SAS system and is included on SAS 9.3 media.

## **CGI Tools and Applications**

### ***Application Dispatcher***

Requires Base SAS software and SAS/IntrNet Server software. The Application Broker component of the Application Dispatcher must be installed on a web server.

### ***htmSQL***

Requires Base SAS software, SAS/SHARE software, and a SAS/IntrNet software license (SETINIT). The htmSQL component must be installed on a web server.

### ***MDDB Report Viewer Application***

Requires Base SAS software, SAS/GRAPH software, SAS/IntrNet software, and SAS/EIS software or SAS OLAP Server software. The Application Dispatcher component must be installed and configured.

### ***Xplore Sample Web Application***

Requires Base SAS software and SAS/IntrNet Server software. The Application Dispatcher component must be installed and configured.

## **Java Tools and Applications**

### ***SAS/CONNECT Driver for Java***

Requires Base SAS software, SAS/CONNECT software, and SAS/IntrNet Server software. SAS/SHARE software must also be installed if data services are used. The Java Tools package must be installed on a web server or client system.

### ***Tunnel Feature***

Must be installed on a web server running on a UNIX or Windows system.

## **SAS/LAB Software**

The following products are required for the installation of SAS/LAB software:

- Base SAS
- SAS/FSP (for interactive data entry)
- SAS/GRAPH

## **SAS/OR 12.1 Software**

The use of graphics in SAS/OR software requires a SAS/GRAPH license. Invoking the OPTLP, OPTMILP, OPTQP, and OPTMODEL procedures in distributed computing mode requires a SAS High-Performance Analytics license.

## **SAS/Warehouse Administrator Software**

### **Products Required for Build Mode**

- Base SAS software
- SAS/AF software (required only for API usage)

### **Products Required for Run Mode**

- Base SAS software
- Other products depending on application (e.g., SAS/ACCESS software for access to DBMS tables, SAS/CONNECT software for access to remote data, or SAS/AF software to access warehouse via method calls)

### **Printers**

- For printing graphics-based objects, a color or gray-scale printer is required.
- Certain non-graphic objects may require SAS/GRAPH software to print, depending on the object.

## Graphics Hardware and Software Compatibility

### **Printers**

SAS/Graph software supports PostScript, HP-GL, HP-GL/2, PCL, and other printer languages on printers from manufacturers such as Brother, Canon, Hewlett-Packard, IBM, Konica Minolta, Lanier, Lexmark, Okidata, QMS, Ricoh, Sharp, Xante, and Xerox.

### **Displays**

Display of graphs requires an Xwindows-capable display, terminal, or emulation software.

### **Images and Interfaces to Other Software**

Included with SAS/GRAPH software are drivers that can produce Computer Graphics Metafiles (CGM) in binary, character, and clear-text formatted output for use by devices or software that support CGM, such as Word for Windows, WordPerfect for Windows, Harvard Graphics, and Lotus Freelance.

SAS/GRAPH software can generate encapsulated PostScript vector files, which can be exported to word processing packages such as Microsoft Word and WordPerfect. SAS/GRAPH software can also generate Windows metafiles that can be exported to numerous packages including Microsoft Office, Lotus Smart Suite, and Perfect Office. Contact SAS Technical Support for details.

SAS/GRAPH software's HPGL or HPGL2 driver can be used to produce files that can be transferred to most vector-based drawing programs such as CorelDraw and Micrografx Designer.

SAS/GRAPH software also has drivers for PDF and SVG along with image file formats of BMP, DIB, EMF, EPSI, PBM, PPM, GIF, JPEG, EMF, WMF, PNG, TIFF, and PaintBrush image formats. In addition, SAS/GRAPH software can import graphics in the following formats:

- BMP - Microsoft Windows Bitmap
- DIB - Device Independent Bitmap
- EMF - Microsoft NT Enhanced Metafile
- EPSI - Encapsulated PostScript Interchange
- GIF - Graphics Interchange Format
- JPG – JPEG Files
- PBM - Portable Bitmap
- PCD - PHOTO CD
- PCX - PC PaintBrush
- PNG - Portable Network Graphics
- TGA - TARGA Format
- TIF - Tagged Image File Format
- WMF - Microsoft Windows Metafile Format
- XBM - X Window Bitmaps
- XWD - X Window Dump

Viewing SVG output requires a browser capable of displaying SVG content, such as Mozilla 1.8+ based browsers (for example, Firefox 1.5+), a plug-in such as Adobe's SVG plug-in, or an application such as Batik's SVG viewer.

Viewing PDF output requires Adobe Reader.

### ***Viewing HTML Pages Created with the ActiveX and Java Device Drivers***

The ActiveX and Java device drivers allow you to create HTML pages from within SAS 9.3 Foundation.

Refer to the "Web Browser" section in this document for an overview of Remote Browsing. This is used to view HTML pages.

To view the Java applets, the Java plug-in must be installed on your desktop computer where the Remote Browser Server is running. On Windows systems, the user can install the plug-in when prompted if it is not already installed.





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