

System Requirements

The SAS[®] System Version 8 (TS M0) Compaq Tru64[™] UNIX[®]

This document provides requirements for installing and running the SAS System for Compaq Tru64 UNIX. You must update your system to meet the minimum requirements before running the SAS System. The major requirements listed in the document are:

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

For additional information and to view the latest system requirements for your system, access the SAS Institute Web site at:

http://www.sas.com/software/enclosures/system_req.html

or contact SAS Institute Technical Support (refer to "Contacting SAS Institute Technical Support" in the *Installation Instructions* included in your package).

For information about Year 2000 compliance, see <http://www.sas.com/y2k>.

Software Requirements

Operating System

The SAS System is supported on the following operating systems:

- DIGITAL UNIX, Version 4.0D
- Tru64 UNIX, Version 4.0F

Note: You must have the OSFSVID2XXX (where XXX refers to the operating system release you are installing) subset installed in order to run the SAS System. This subset provides UNIX SVID2 compatibility. See the `setld` command for further information on how to install this subset or to see if this subset is already installed.

It is necessary to reconfigure the Compaq Tru64 UNIX kernel in order to run the SAS System. The following line must be in the kernel configuration file for your system's machine (the default value is 200 as shipped):

```
mapentries      400
```

Note: Setting `mapentries` to 400 will allow approximately eight average SAS sessions. The formula is as follows:

$$\text{mapentries} = 200 + 25 * \text{"number of SAS System users"}$$

In this example, the number of SAS System users is eight, so:

$$\text{mapentries} = 200 + 25 * 8 = 400$$

Use the method for **Dynamic System Configuration in Chapter 5, Configuring the Kernel** in the **System Administration, Compaq Tru64 UNIX** guide. See the `sysconfig` man page. Use the `-q vm` command to query the `vm` subsystem where `mapentries` is one of its attributes. Once this attribute is changed, the system will need to be rebooted. Please note that this can be done after installing the SAS System.

It is highly recommended that you also change the following kernel parameters if you will be running large SAS jobs:

```
vm-maxvas 4294967296
```

The maximum default virtual address space limit for any process running on Compaq Tru64 UNIX is 1 GB. Large SAS applications can perform better with more virtual address space, so we set the maximum virtual address space limit for any process to be 4 GB in this example. You may set this higher if necessary. Note that it is common to have a virtual address space larger than the amount of physical memory on the system. Also note that setting this parameter to 4 GB does not mean that all processes will then have a 4 GB virtual address space, it only allows the ability to give processes a 4 GB virtual address space. You will need to increase the value of the `max-per-proc-address-space` parameter to actually allow processes to have a larger virtual address space. In this case, the maximum value you would be able to assign the `max-per-proc-address-space` parameter would be 4 GB.

```
max-per-proc-address-space 4294967296
```

This is the value for virtual address space for any process running on Compaq Tru64 UNIX. Set this to the maximum virtual address space value assigned to the `vm-maxvas` parameter.

```
max-per-proc-data-size 4294967296
```

This is the value for the maximum allowable size of the data space for any process on Compaq Tru64 UNIX. Set this to the maximum virtual address space value assigned to the `vm-maxvas` parameter.

```
vm-vpagemax 32768
```

By increasing this value from the default of 16384, the `mprotect` system call will work properly when running large SAS jobs.

Web Browser

The SAS System requires:

- Netscape Navigator, Version 4.08 or higher

Note: Netscape Communicator, Version 4.5 or 4.6 can be used but may fail to redraw when resizing the window.

The latest version of Netscape can be downloaded from:
<http://home.netscape.com/computing/download/index.html>

Utilities

The SAS System requires the installation of two public domain utilities in order to send MIME format email with attachments from within the SAS System:

- elmailias
- splitmail

These utilities can be downloaded by anonymous ftp from the SAS Institute Technical Support Web site:

<ftp://ftp.sas.com/techsup/download/unix/email/v8>

Follow the instructions in the README file to properly install these utilities.

Hardware Requirements

Machines Supported

- All models that support DIGITAL UNIX, Version 4.0D
- All models that support Tru64 UNIX, Version 4.0F

Distribution Media

- CD-ROM

Memory Requirements

- 96 MB or more recommended
- 16 MB additional recommended for each concurrent user

Terminals Supported

- Any X Windows-based terminal or server that supports a minimum of 256 colors

Space Requirements

The media you received is customized for your site and contains all of the SAS software products for which you are licensed.

The following list contains space requirements in MB for all of the products available with this version of the SAS System for Compaq Tru64 UNIX. Use this information to help you determine how much free disk space you must have available before you can install the SAS System.

The SAS System installation requires that 20 MB of hard disk space be available on the /tmp partition.

Software Product	Required Disk Space	Additional Space for Samples and Optional Files
Base SAS Software	242.2	7.8
SAS/ACCESS Interface to Baan Software	0.8	0.0
SAS/ACCESS Interface to CA-OpenIngres Software	2.8	0.2
SAS/ACCESS Interface to INFORMIX Software	1.0	0.2
SAS/ACCESS Interface to ODBC Software	0.9	0.2
SAS/ACCESS Interface to ORACLE Software	1.3	0.2
SAS/ACCESS Interface to PC File Formats Software	0.4	0.0
SAS/ACCESS Interface to R/3 Software	4.7	0.1
SAS/ACCESS Interface to SYBASE Software	1.7	0.2
SAS/AF Software	12.6	0.0
SAS/ASSIST Software	16.7	0.0
SAS/CONNECT Software	6.0	0.2
SAS/EIS Software	26.7	10.5
SAS/ETS Software	26.5	0.5
SAS/FSP Software	1.8	0.0
SAS/GIS Software	48.3	0.3
SAS/GRAPH Software	47.7	2.5
SAS/GRAPH Map Data Sets	127.7	0.0
SAS/IML Software	11.8	0.5
SAS/INSIGHT Software	24.4	0.4
SAS/IntrNet Software	2.4	0.8
SAS/LAB Software	8.8	0.0
SAS/MDDDB Server Software	13.1	0.0
SAS OnlineTutor Software	145.0	0.0
SAS/OR Software	41.7	1.8
SAS/QC Software	34.6	3.9
SAS/SECURE Software (Domestic)	2.7	0.0
SAS/SECURE Software (International)	2.7	0.0
SAS/SHARE Software	14.9	0.2
SAS/SPECTRAVIEW Software	2.4	11.4
SAS/STAT Software	52.2	1.8
SAS/TOOLKIT Software	15.4	0.0
SAS/Warehouse Administrator Software	47.3	0.0
Total	989.2	43.7

SAS/GIS Census Tract Maps

State	Required Disk Space in KB
Alabama	13.2
Alaska	10.3
Arizona	4.0
Arkansas	11.9
California	18.4
Colorado	8.2
Connecticut	2.8
Delaware	0.8
District of Columbia	0.1
Florida	15.6
Georgia	15.7
Hawaii	1.6
Idaho	8.6
Illinois	14.3
Indiana	8.3
Iowa	8.2
Kansas	8.9
Kentucky	12.9
Louisiana	17.3
Maine	8.3
Maryland	4.5
Massachusetts	4.9
Michigan	13.3
Minnesota	17.8
Mississippi	9.8
Missouri	13.5

State	Required Disk Space in KB
Montana	13.1
Nebraska	7.3
Nevada	3.3
New Hampshire	2.8
New Jersey	4.4
New Mexico	4.8
New York	15.2
North Carolina	16.0
North Dakota	9.8
Ohio	12.1
Oklahoma	9.7
Oregon	10.0
Pennsylvania	14.6
Rhode Island	0.9
South Carolina	9.9
South Dakota	8.7
Tennessee	14.7
Texas	28.7
Utah	5.3
Vermont	2.1
Virginia	12.5
Washington	10.1
West Virginia	7.0
Wisconsin	13.9
Wyoming	7.2
Total for all entries	497.3

SAS/IntrNet Software Components

Software Component	Required Disk Space in MB
CGI Tools for Web Server	1.4
Java Tools	1.8
MetaSpace Explorer	10.5
Connection Wizard	7.8
Total	21.5

Specific Product Requirements

SAS/ACCESS Interface to CA-OpenIngres Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to CA-OpenIngres software

DBMS Products Required:

- CA-OpenIngres, 1.2/00

CA-OpenIngres ESQ/C development tools are required on the local SAS node. The CA-OpenIngres installation can be a Server, NFS Client, or Tools Client installation. To use SAS/ACCESS Interface to CA-OpenIngres software in a distributed environment, CA-OpenIngres/Net is required.

SAS/ACCESS Interface to INFORMIX Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to INFORMIX software

DBMS Products Required:

One of the following INFORMIX releases is required:

- INFORMIX, Version 7.30.FC4
- INFORMIX, Version 8.21.FD2

For INFORMIX, Version 7 and Version 8 releases, the INFORMIX ESQ/C development tools are required on the local SAS node. An INFORMIX ONLINE server is required either on the local SAS node or a remote node.

SAS/ACCESS Interface to ODBC Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to ODBC software

DBMS Products Required:

- A compliant ODBC driver manager and ODBC driver

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 `LIBPATH` so that the ODBC drivers can be loaded dynamically at run time.

For more information, please consult your ODBC driver vendor.

SAS/ACCESS Interface to ORACLE Software

Products Required:

- Base SAS software
- 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 that has Oracle SQL*Net support.

One of the following Oracle releases is required:

- Oracle, Release 7.3.4.x
- Oracle, Release 8.0.x
- Oracle, Release 8.1.x

SAS/ACCESS Interface to R/3 Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to R/3 software

Additional functionality is obtained if the following products are installed:

- SAS/Warehouse Administrator software
- SAS/CONNECT software
- SAS/SHARE software

SAS/ACCESS Interface to R/3 software requires the use of communication protocols such as TCP/IP to function properly.

SAP R/3 Products Required:

- SAP R/3, Release 2.2 or higher
- SAP R/3 Remote Function Call Software Development Kit (RFCSDK)

SAS/ACCESS Interface to SYBASE Software

Products Required:

- Base SAS software
- SAS/ACCESS Interface to SYBASE software

DBMS Products Required:

SYBASE Server, Release 10.x or higher is supported.

One of the following releases of SYBASE Open Client CT-Library is required:

- SYBASE Open Client, Release 10.0.4 (EBF 8476 or higher)
- SYBASE Open Client, Release 11.1.1 (EBF 8379 or higher)

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 ODBC software with an appropriate ODBC driver to obtain access to Microsoft SQL Server data.

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:

- 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.

Video Player Object in SAS/AF Software

Hardware:

- Audio is not supported.

Base SAS Software

External Tape Devices Supported:

The TAPE device type is supported for the following tape devices:

- 4mm cartridge tapes
- 8mm cartridge tapes

Video Player in Base SAS Software

A Video Player utility is included with Base SAS software. This allows users to play video clips on their workstations. The Video Player Object (Class) is actually part of SAS/AF software.

Hardware:

- Audio is not supported.

SAS/CONNECT Software

TCP/IP Access Method:

- Any TCP/IP package that comes with the operating system

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
- 128 MB recommended

Printers:

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

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 the SAS System media. Other SAS/IntrNet software components may be installed from the SAS/IntrNet software media. See the **Space Requirements** section for the disk space requirements for these components.

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 (Experimental)

Requires Base SAS software, SAS/GRAPH software, SAS/IntrNet software, and SAS/EIS 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.

MetaSpace Explorer Applet

Requires Base SAS software, SAS/CONNECT software, and SAS/IntrNet Server software.

SAS/LAB Software

Products Required:

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

SAS/MDDB Server Software

Memory:

The memory requirements for SAS/MDDB Server software are dependent upon the complexity of the hierarchies generated.

- 96 MB required
- 128 MB or more recommended

Large applications will see performance improvements with more available memory.

SAS/SHARE Software

TCP/IP Access Method:

- Any TCP/IP package that comes with the operating system

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 provides device drivers for all Hewlett-Packard printers (and compatibles), and printers that support PostScript, HP-GL, HP PCL, and other printer languages. Here is a partial list of printers that SAS/GRAPH software supports:

CalComp ColorMaster, ColorMaster Plus, PlotMaster
Canon Bubble Jet, Laser Shot
Digital printers that support either SIXEL, HP PCL, Tektronix, or PostScript emulation modes
Epson FX and LQ series printers (and all printers running in Epson emulation mode)
Hewlett-Packard LaserJet, DeskJet, PaintJet, and DesignJet printers (and compatibles)
IBM Graphics, Proprinter, and ColorJet printers
PostScript printers (including color and gray-scale PostScript printers)
QMS Colorgrafix with CGM interpreter
QMS 800, 1200, 1500, 2200, and 2400 using QUIC or Tektronix emulation modes
Talaris 800, 802, 1200, 1500, and 2400 using QUIC or Tektronix emulation modes
Talaris printers using the EXCL language
Tektronix Phaser printers (all models)
Tektronix 4693 printers with Tektronix 4510 rasterizer
Xerox 2700 and 4045 printers with a GRAPHX cartridge
Xerox 3700 (with imaging board and at least 1M of memory)
Xerox 4030 (contact Technical Support), 4213, 4235, and 4700
Xerox 4700 printer
Xerox 5775 color copier with an EFI Fiery attachment

SAS/GRAPH device drivers may also be available for additional printers not listed above and that do not support PostScript, HP-GL, or HP PCL. For additional information on these drivers, contact SAS Institute Technical Support.

Terminals and Displays

SAS/GRAPH software supports graphics display on graphics terminals from DEC, Tektronix, HP, and on X Windows terminals. SAS/GRAPH software also supports graphics emulators that emulate any of the above terminals. Note the use of the SAS/GRAPH graphics editor requires an X Windows display or X Windows emulation software.

Plotters

SAS/GRAPH software provides device drivers for all HP plotters supporting HP-GL or HP-GL/2, and plotters from other manufacturers that support the HP-GL or HP-GL/2 language. SAS/GRAPH software also supports Houston Instruments plotters using the DMPL language and ZETA plotters that support the GML language.

Film Recorders

SAS/GRAPH software provides device drivers that support the following film recorders:

Genigraphics Masterpiece Camera System with SCODL interface
Lasergraphics MPS 2000 film recorder with a Lasergraphics UI-100 or RASCOL rasterizer
Matrix QCR and PCR cameras with Matrix QVP, MVP, or Lasergraphics rasterizers
Polaroid Palette CI-3000 and CI-5000
Presentation Technologies Montage film recorder

Support may be available for other film recorders not listed here. For details, contact SAS Institute Technical Support.

Interfaces to Other Graphics Software

Included with SAS/GRAPH software is a series of drivers that can produce Computer Graphics Metafiles (CGM) in binary, character, and clear-text formats. These drivers can be used to transfer SAS/GRAPH output to other products that support CGM input, such as Word for Windows, WordPerfect for Windows, Harvard Graphics, and Lotus Freelance, or to devices that can process CGM input.

SAS/GRAPH software can also generate encapsulated PostScript vector files, which can be exported to word processing packages such as Microsoft Word, WordPerfect, and several others.

Many other graphics and word processing applications can process files in Hewlett-Packard (HP-GL) format. The HPGL driver can be used to produce files that can be transferred to most applications that can process HP-GL files. In addition, there are drivers for PDF, PBM, PPM, GIF, JPEG, EMF, WMF, PNG, TIFF, EPSI, and PaintBrush image formats. To view a complete list of all SAS/GRAPH device drivers, submit the following SAS program:

```
proc gdevice c=sashelp.devices nofs;
  list _all_;
run; quit;
```

SAS/GRAPH software can also export graphics in the following formats:

- BMP - Microsoft Windows Bitmap
- EPS - Encapsulated PostScript
- GIF - Graphics Interchange Format
- PNG - Portable Network Graphics
- PPM - Portable Pixmap
- PS - PostScript Bitmap
- TIF - Tagged Image File Format
- XPM - X11 Pixmap
- JPG - JPEG Files
- XBM - X11 Bitmap

In addition, SAS/GRAPH software can import graphics in the following formats:

- BMP - Microsoft Windows Bitmap
- EPS - Encapsulated PostScript
- GIF - Graphics Interchange Format
- PBM - Portable Bitmap
- PCD - Kodak Photo-CD
- PCX - PC PaintBrush
- PGM - Portable Graymap
- PNG - Portable Network Graphics
- PNM - Portable Anymap
- PPM - Portable Pixmap
- TGA - Targa format
- TIF - Tagged Image File Format
- XBM - X11 Bitmap
- XPM - X11 Pixmap
- XWD - X Window Dump
- JPG - JPEG Files

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 the SAS System.

The HTML pages created with the ActiveX device driver can only be viewed on Windows operating systems with Internet Explorer, Version 5.

The HTML pages created with the Java device driver can only be viewed *with* the following Java-enabled Web browsers *on* the following operating systems:

Java-enabled Web Browser	Operating System
Netscape Navigator, Version 4.08 or higher	AIX/6000, HP-UX, Solaris, ABI for Intel Architecture, IRIX, Compaq Tru64 UNIX
Netscape Communicator, Version 4.04 for Warp 4	OS/2
Internet Explorer, Version 5 or Netscape Navigator, Version 4.07	Windows, Windows NT, Windows NT Server

*SAS® and all other SAS Institute product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration.
IBM®, AIX/6000®, DB2®, OS/2®, and OS/390® are registered trademarks or trademarks of International Business Machines Corporation.
ORACLE® and Oracle Rdb™ are registered trademarks or trademarks of Oracle Corporation. ® indicates USA registration.
Other brand and product names are registered trademarks or trademarks of their respective companies.
Copyright (c) 1999 SAS Institute Inc. Cary, NC, USA. All rights reserved.*