

# System Requirements

## The SAS<sup>®</sup> System Release 8.2 (TS2M0) OS/390<sup>®</sup>

This document provides requirements for installing and running the SAS System under OS/390. 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 following Web site:

<http://www.sas.com/newversion>

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

## Software Requirements

### Operating System

- OS/390, Version 2, Release 6 or subsequent releases
- z/OS, Version 1, Release 1 or any subsequent releases

(if using the SAS ISPF interface, the current IBM-supported release of ISPF for your operating system release is supported)

# Hardware Requirements

*Note:* If there are only limited tape drive resources available for the installation of the SAS System, then refer to the section “Enabling minimal cartridge mounts from a Multi 3480 cart media” in the *Installation Instructions and System Manager's Guide for Release 8.2 (TS2M0) of the SAS System under OS/390*.

## **Machines Supported**

- S/390 or z/Series architecture machines and compatibles

## **Tape Drives Supported**

- 9-track (1600 bpi or 6250 bpi)
- IBM 3480 compatible drives
- IBM 3590 compatible drives

## **Distribution Media**

- Cartridges for IBM 3480 drives
- Cartridges for IBM 3590 drives

## **Memory Requirements**

The total memory required for a SAS session depends on the work being performed and the SAS system options that are active. Most work, up to moderately large jobs, can be run in a region that provides 32 MB of storage above the line. This is recommended for both batch jobs and TSO sessions.

If you install the SAS bundles into LPA, the region requirements for SAS jobs will be reduced, because less storage is needed in the region for SAS executable modules. Information regarding installation of LPA bundles can be found in the installation instructions included in your package.

## **Mouse Requirements**

- IBM 3179G, 3192G, and 3472G
- Most 3270 emulation packages with host graphics allow for mainframe mouse support

# Space Requirements

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

Approximate space requirements for all of the products available with Release 8.2 (TS2M0) of the SAS System are listed below. Amounts reflect estimated space usage on 3380 DASD (or equivalent) following a default install of all libraries associated with each product.

Software Product	3380 Tracks (or equivalent)	MB	DBCS Asian Language Support Software <sup>4</sup> 3380 Tracks (or equivalent)	MB
Control Data Set	120	5.5		
Base SAS Software <sup>1</sup>	5,207	213.0	953	39.0
SAS/ACCESS Interface to ADABAS Software	16	0.7	6	0.2
SAS/ACCESS Interface to CA-Datcom/DB Software	17	0.7	6	0.2
SAS/ACCESS Interface to CA-IDMS Software	6	0.3		
SAS/ACCESS Interface to DB2 Software	23	0.9	9	0.4
SAS/ACCESS Interface to IMS Software	19	0.8	9	0.4
SAS/ACCESS Interface to ORACLE Software	20	0.8	12	0.5
SAS/ACCESS Interface to PC File Formats Software	5	0.2	3	0.1
SAS/ACCESS Interface to SYSTEM 2000 Software	39	1.6	5	0.2
SAS/ACCESS Interface to Teradata Software	13	0.6	7	0.3
SAS/AF Software	18	0.7	10	0.4
SAS/ASSIST Software	389	16.0		
SAS/CONNECT Software <sup>2</sup>	52	2.1	13	0.5
SAS Data Quality - Cleanse	150	6.1		
Enterprise Miner Server Software	1,883	77.0		
SAS/ETS Software	547	22.3		
SAS/FSP Software	21	0.8	8	0.3
SAS/GIS Software	1,257	51.4		
SAS/GIS Census Tract Maps <sup>3</sup>	10,650	489.9		
SAS/GRAPH Software	3,312	135.5	100	4.0
SAS High-Performance Forecasting Software	17	0.7		
SAS/IML Software	145	6.0		
SAS/IntrNet Software	203	8.3	11	0.4
SAS Integration Technologies Software	202	8.2	6	0.2
SAS IT Resource Management Server Software	2,870	117.3		
SAS IT Security Management Server Software	2,870	117.3		
SAS IT Service Level Management Software	48	1.9		
SAS/LAB Software	171	7.0	22	0.9
SAS/MDDDB Server Software	61	2.5		
SAS/OR Software	732	30.0		
SAS/QC Software	281	12.0	10	0.4
SAS/SECURE 168-bit Software	23	0.9		

<b>Software Product</b>	<b>3380 Tracks (or equivalent)</b>	<b>MB</b>	<b>DBCS Asian Language Support Software<sup>4</sup> 3380 Tracks (or equivalent)</b>	<b>MB</b>
SAS/SESSION Software	4	0.2		
SAS/SHARE Software <sup>2</sup>	15	0.6	4	0.2
SAS/STAT Software	550	22.5	16	0.7
SAS/TOOLKIT Software	256	10.5		
SAS Support Tools	47	1.9		

1. This estimate does not include approximately 2000 additional tracks that are required on your installation volume for a temporary cataloged datalib used during the SAS System install. This additional space will be released at the conclusion of the install.
2. If you are installing a new SAS System from this media, double the space requirement computed from the table above. This additional space will be released at the conclusion of the install.
3. SAS/GIS Census Tract Maps are divided into 51 state segments of approximately 209 tracks each or 9.6 MB each.
4. This space may be released following installation if DBCS Asian Language Support is not needed at your site.

### **SAS/IntrNet Software Components**

<b>Software Component</b>	<b>Required Disk Space in MB</b>
CGI Tools for Web Server	6.6
Java Tools	1.8
MetaSpace Explorer	10.5
Connection Wizard	7.8
<b>Total</b>	<b>26.7</b>

### **Languages**

If you intend to install any language (French, German, Italian, Spanish-Castilian, or Japanese), please add an additional 10% of space for each language you install.

# Specific Product Requirements

## SAS/ACCESS Interface to ADABAS Software

### **DBMS Products Required:**

- ADABAS, Release 6.2.1 or subsequent releases

### **Optional DBMS Products:**

- NATURAL, Release 2.3.2 or subsequent releases
- NATURAL Security, Release 2.3.2 or subsequent releases
- PREDICT, Release 3.4.1 or subsequent releases

## SAS/ACCESS Interface to CA-DATACOM/DB Software

### **DBMS Products Required:**

- CA-DATACOM/DB, Release 9.0 or subsequent releases
- CA-DATADictionary, Release 9.0 or subsequent releases

## SAS/ACCESS Interface to CA-IDMS Software

### **DBMS Products Required:**

- CA-IDMS, Release 14.0 or subsequent releases

## SAS/ACCESS Interface to DB2 Software

### **DBMS Products Required:**

- DB2, Release 6.1 or subsequent releases

## SAS/ACCESS Interface to IMS Software

### **DBMS Products Required:**

- IMS/VS, Version 6.1 or subsequent versions

## SAS/ACCESS Interface to ORACLE Software

### **DBMS Products Required:**

- Oracle, Version 7.3.3.6 or subsequent versions

## SAS/ACCESS Interface to SYSTEM 2000 Software

### **DBMS Products Required:**

- SYSTEM 2000, Release 11.6 with Field Fix 1 or higher

## SAS/ACCESS Interface to Teradata Software

### **DBMS Products Required:**

- Teradata RDBMS Server, Version 2, Release 2 (V2R2) or higher
- Teradata Client Software installed on OS/390. SAS/ACCESS uses CLIV2 libraries supplied with the Teradata Utilities Foundation (TUF)

**Note:** Connectivity from the OS/390 client machine to the Teradata DBS server machine should be established and validated as described in the *Teradata Client for MVS Installation Guide*. If you are successfully accessing tables with the Teradata BTEQ utility, you already have the needed connectivity.

## SAS Activity-Based Management Software

### **Products Required for Activity-Based Management ETL Server:**

- Base SAS software
- SAS/ACCESS engine of choice
- SAS Activity-Based Management ETL Server, which contains necessary elements of the following:
  - SAS/CONNECT software
  - SAS Integration Technologies software

### **Disk Space Required for Activity-Based Management ETL Server:**

The disk space required for the Activity-Based Management ETL Server is the combined total space requirements for the SAS software products listed above. See the **Space Requirements** table for more information.

**Note:** If you have Release 8.2 of the SAS System already installed, then the amount of disk space required to install the Activity-Based Management ETL Server should be decreased by the disk space of any of the above products that have been previously installed.

### **Products Required for Activity-Based Management ETL Administrator:**

- Base SAS software
- SAS Activity-Based Management ETL Administrator, which contains necessary elements of the following:
  - SAS/CONNECT software
  - SAS/Warehouse Administrator software

## **Disk Space Required for Activity-Based Management ETL Administrator:**

The disk space required for the Activity-Based Management ETL Administrator is the combined total space requirements for the SAS software products listed above. See the **Space Requirements** table for more information.

**Note:** If you have Release 8.2 of the SAS System already installed, then the amount of disk space required to install the Activity-Based Management ETL Administrator should be decreased by the disk space of any of the above products that have been previously installed.

## **Base SAS Software**

A default OE Segment is required or an OE Segment for each user is required.

### **TCP/IP Access Method:**

With the TCP/IP access method, one of the following versions of TCP/IP is required:

- CA NETWORK/IT TCPAccess (formerly SOLVE: TCPAccess)
- IBM TCP/IP

## **SAS/CONNECT Software**

### **TCP/IP Access Method:**

Please refer to the “Base SAS Software” section for TCP/IP Access Method requirements.

## **Enterprise Miner Solution (Release 4.1)**

### **Products Required for Enterprise Miner Server:**

- Base SAS software
- Enterprise Miner Server software
- SAS/STAT software
- Enterprise Miner Server Solution, which contains necessary elements of the following:
  - SAS/CONNECT software
  - SAS/ETS software
  - SAS/GRAPH software

**Note:** Enterprise Miner Server media contains the experimental product Enterprise Miner for Text Mining. Enterprise Miner for Text Mining provides a set of tools to examine documents and text for patterns, to perform semantic analysis, and to mine text for information. Enterprise Miner for Text Mining constitutes pre-production code and may be changed substantially before the first production release. Please see your SAS Support Consultant for more information on Enterprise Miner for Text Mining.

## **Memory for Enterprise Miner Server:**

The memory requirements for Enterprise Miner Server software are dependent upon the size of the data to be analyzed and the analysis methods selected.

- 48 MB required
- 64 MB recommended

Large applications will see performance improvements with more available memory.

## **Disk Space Required for Enterprise Miner Server:**

The disk space required for the Enterprise Miner Server Solution is the combined total space requirements for the SAS software products listed above. See the “Space Requirements” table for more information.

*Note:* If you have Release 8.2 of the SAS System already installed, then the amount of disk space required to install the Enterprise Miner Server Solution should be decreased by the disk space of any of the above products that have been previously installed.

## **SAS/GIS Software**

### **Products Required:**

- Base SAS software
- SAS/GIS software
- SAS/GRAPH software
- Other products may be required depending on the application

## **SAS/GRAPH Software**

### **The Graphics Editor**

#### **Terminals:**

- IBM 3192, 3179, 3472 graphics terminals
- Most 3270 emulation packages with host graphics should support the SAS/GRAPH graphics editor

## **SAS Information Delivery Portal (Release 1.1)**

### **Products Required for SAS Information Delivery Portal Server:**

- Base SAS software
- SAS Information Delivery Portal Server Components, which contains necessary elements of the following:
  - SAS Integration Technologies Software



## **Disk Space Required for SAS Information Delivery Portal Server:**

The disk space required for the SAS Information Delivery Portal Server Components is the combined total space requirements for the SAS software products listed above. See the **Space Requirements** table for more information.

**Note:** If you have Release 8.2 of the SAS System already installed, then the amount of disk space required to install the SAS Information Delivery Portal Server Components should be decreased by the disk space of any of the above products that have been previously installed.

## **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 Client-Side Components CD. See the **Space Requirements** section for the disk space requirements for these components.

SAS/IntrNet components may be used with a Web server installed on OS/390 or on another operating system. If the Web server is installed on OS/390, Version 2.2 or later of IBM Internet Connection Server is required.

All SAS/IntrNet components require the use of TCP/IP. Please refer to the “Base SAS Software” section for TCP/IP Access Method requirements.

## **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. Use of the Pool Services feature requires the installation of the OS/390 Spawner. The OS/390 Spawner requires OS/390, Version 2, Release 6 or later.

### **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 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, SAS/IntrNet Server software, and the OS/390 Spawner. The OS/390 Spawner requires OS/390, Version 2, Release 6 or later. 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 IT Resource Management Server Software (Release 2.6)

### Products Required for SAS IT Resource Management Server:

- Base SAS software
- SAS IT Resource Management Server software, which requires installation of the following:
  - SAS/ACCESS to DB2 software
  - SAS/ACCESS to Oracle software
  - SAS/AF software
  - SAS/CONNECT software
  - SAS/ETS software
  - SAS/FSP software
  - SAS/GRAPH software
  - SAS Integration Technologies software
  - SAS/MDDDB Server software
  - SAS/STAT software

### Disk Space Required for SAS IT Resource Management Server:

The disk space required for the SAS IT Resource Management Server is the combined total space requirements for the SAS software products listed above. See the **Space Requirements** table for more information.

**Note:** If you have Release 8.2 of the SAS System already installed, then the amount of disk space required to install the SAS IT Resource Management Server should be decreased by the disk space of any of the above products that have been previously installed.

### Terminals Required:

- 32-line terminal
- Terminal emulation package with graphics capability
- Terminal that supports vector graphics and uses a mouse recommended

SAS IT Resource Management Server software supports MXG releases beginning with Release 11.06. New MXG releases are supported within a few months of their shipment.

## **SAS IT Security Management Software (Release 2.6, Pre-Production)**

SAS IT Security Management is a new product that combines new functionality with SAS IT Resource Management. While SAS is confident in the quality of SAS IT Resource Management, we are delivering the new functionality as pre-production. Therefore, for system requirements specific to installing and running SAS IT Security Management, please use the system requirements for SAS IT Resource Management above, replacing SAS IT Resource Management Server Software with IT Security Management Server Software when calculating file sizes. If you are installing both IT Resource Management and IT Security Management, you should only count the file sizes once.

## **SAS IT Service Level Management Server Software (Release 2.6)**

### **Products Required for SAS IT Service Level Management Server:**

- Base SAS software
- SAS IT Resource Management Server 2.6
- SAS/IntrNet software

### **Disk Space Required for SAS IT Service Level Management Server:**

The disk space required for the SAS IT Service Level Management Server is the combined total space requirements for the SAS software products listed above. See the **Space Requirements** table for more information.

*Note:* If you have Release 8.2 of the SAS System already installed, then the amount of disk space required to install SAS IT Service Level Management Server should be decreased by the disk space of any of the above products that have been previously installed.

## **SAS/LAB Software**

### **Products Required:**

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

## SAS Marketing Automation Solution

### Products Required for SAS Marketing Automation Server:

- Base SAS software
- SAS/ACCESS software of choice
- SAS Marketing Automation Server Solution, which contains necessary elements of the following:
  - SAS/AF software
  - SAS/CONNECT software
  - Enterprise Miner Server software
  - SAS/ETS software
  - SAS/GRAPH software
  - SAS Integration Technologies software
  - SAS/IntrNet software
  - SAS/MDDB Server software
  - SAS/OR software
  - SAS/SHARE software
  - SAS/STAT software

### Disk Space Required for SAS Marketing Automation Server:

The disk space required for the SAS Marketing Automation Server is the combined total space requirements for the SAS software products listed above. See the **Space Requirements** table for more information.

**Note:** If you have Release 8.2 of the SAS System already installed, then the amount of disk space required to install the SAS Enterprise Marketing Automation Data Server should be decreased by the disk space of any of the above products that have been previously installed.

## SAS/MDDB Server Software

### Memory:

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

- 48 MB required
- 64 MB recommended

Large applications will see performance improvements with more available memory.

## SAS OLAP Server Package

### Products Required:

- Base SAS software
- SAS OLAP Server Package, which contains necessary elements of the following:
  - SAS/MDDDB Server software
  - SAS/AF software
  - SAS/GRAPH software

### Disk Space Required:

The disk space required for the SAS OLAP Server Package is the combined total space requirements for the SAS software products listed above. See the **Space Requirements** table for more information.

**Note:** If you have Release 8.2 of the SAS System already installed, then the amount of disk space required to install the SAS OLAP Server Package should be decreased by the disk space of any of the above products that have been previously installed.

## SAS/SESSION Software

### Products Required:

- CICS/ESA, Version 3, Release 3 or subsequent versions

## SAS/SHARE Software

### Components Required:

- Version 8 SAS SVC Routine

Refer to “Part 1, Setting Up the SAS System” in the *Installation Instructions and System Manager’s Guide for Release 8.2 (TS2M0) of the SAS System under OS/390* for information on the Version 8 SAS SVC Routine.

### TCP/IP Access Method:

Please refer to the “Base SAS Software” section for TCP/IP Access Method requirements.

# Graphics Hardware and Software Compatibility

## Terminals and Displays

SAS/GRAPH software supports standard IBM graphics terminals (such as the IBM 3179G, IBM 3192G, and IBM 3472G terminals).

SAS/GRAPH software should also be able to support most 3270 emulation packages as long as the 3270 emulation software is configured to provide host graphics support.

## Printers

SAS/GRAPH software should be able to support almost any graphics printer on the market (provided that the graphics format that a printer supports is compatible with the graphics format written out by SAS/GRAPH device drivers). SAS/GRAPH software is compatible with most (if not all) printers that support HP-PCL, HP-GL, HP-GL/2, and PostScript languages. SAS/GRAPH software supports most printers from manufacturers such as Hewlett-Packard, Xerox, QMS, and Tektronix.

SAS/GRAPH software supports most IBM printers (such as the IBM 3800, IBM 3812, IBM 3816, IBM 3820, IBM 3900, and IBM 4224). SAS/GRAPH software support for some IBM printers (such as the IBM 3800 and 3900 printers) may require the GDDM base product. For more information on which printers require the GDDM base product, contact SAS Institute Technical Support.

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;
```

The device driver list is sent to the SAS Output window (if running interactively) or to the SASLIST file (if running in batch).

## Plotters and Film Recorders

SAS/GRAPH software should be able to support most plotters and film recorders on the market today. SAS/GRAPH software supports all HP and HP-compatible plotters that support HP-GL and HP-GL/2 languages. SAS/GRAPH software should also be able to support most film recorders that support HP-GL, Scodl, and Lasergraphics languages.

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;
```

The device driver list will be sent to the SAS Output window (if running interactively) or to the SASLIST file (if running in batch).

## **Protocol Converters**

SAS/GRAPH supports the following 3287-type protocol converters:

- Agile
- Andrew Data Systems
- Avatar
- Axis
- Cablenet
- I-Data
- IDEX
- I/O Corporation
- IRMAprint and IRMAprint2
- ISI 87
- KMW 3287
- Local Data Interlynx 3287
- NetCommander

Use of most graphics printers with 3287-type protocol converters listed above requires special communications software (such as VPS) that can access these types of devices through the JES subsystem. Contact SAS Institute Technical Support for more information.

SAS/GRAPH supports the following 3270-type protocol converters:

- Commtext C-80
- Datastream
- IBM 7171
- KMW 3270-FS
- Local Data Datalynx
- Micom 7400
- PCI 1071, 1076
- Renex
- Hydra

## **Interfaces with other Graphics Software**

Included with SAS/GRAPH software is a series of device drivers that can produce output in Computer Graphics Metafile (CGM) format. These files can be used to transfer SAS/GRAPH output to other products that can import CGM files, such as Harvard Graphics, Microsoft Word, and Microsoft PowerPoint.

SAS/GRAPH software also provides device drivers to create output in various other graphics file formats, such as HP-GL, PostScript, Encapsulated PostScript, GIF, JPEG, TIFF, and PDF format.

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;
```

The device driver list will be sent to the SAS Output window (if running interactively) or to the SASLIST file (if running in batch).

The GIMPORT procedure, part of SAS/GRAPH software, can be used to convert CGM files produced by other applications to graphics entries in a SAS catalog. You can use this feature to display output from other applications using SAS/GRAPH device drivers.

## 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:

<b>Java-enabled Web Browser</b>	<b>Operating System</b>
Netscape Navigator, Version 4.08 or higher	AIX, 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 (with Java VM 5.0.0.3167 or higher) or Netscape Navigator, Version 4.07	Windows, Windows NT, Windows NT Server

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