

System Requirements for SAS[®] 9.1.3 Foundation for z/OS[®]



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The correct bibliographic citation for this manual is as follows: SAS Institute Inc., *System Requirements for SAS® 9.1.3 Foundation for z/OS®*, Cary, NC: SAS Institute Inc., 2008.

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Note: *z/OS is the successor to the OS/390 operating system. SAS 9.1.3 Foundation for z/OS runs on both z/OS and OS/390, and throughout this document any reference to z/OS should be interpreted to refer equally to OS/390, unless otherwise stated. Likewise, any reference to z/OS also applies to z/OS.e unless otherwise stated.*

This document provides requirements for installing and running SAS 9.1.3 Foundation under z/OS. You must update your system to meet the minimum requirements before running SAS 9.1.3 Foundation. The major requirements listed in the document are:

- Software Requirements on page 1.
- Hardware Requirements on page 2.
- Space Requirements on page 3.
- Specific Product Requirements on page 4.
- Graphics Hardware and Software Compatibility on page 24.

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

<http://support.sas.com/documentation/installcenter/913/kit/index.html>

or contact SAS Institute Technical Support (refer to the "Service and Support" section in the Installation Kit).

Software Requirements

Operating System

- OS/390, Version 2, Release 10
- z/OS, Version 1, Release 2, or any subsequent releases
- z/OS.e, Version 1, Release 2, or any subsequent releases

Note: *If you are using the SAS ISPF interface, the current IBM-supported release of ISPF for your operating system is supported.*

UNIX System Services Requirements

In SAS 9.0 and later releases, the user completing the installation needs minimum access to UNIX System Services (USS). This means an OMVS segment is needed for the user ID either specifically defined or as a default for all user IDs. This minimum requirement allows the user to be 'dubbed' in UNIX terms, but does not require any use of a UNIX File System (HFS or zFS).

Note: *The USS requirement is not restricted to installation. All users of SAS 9.0 and later releases will require an OMVS segment.*

Java Requirements

Some new features of SAS 9.1.3 require the use of a Java Software Development Kit (also referred to as an SDK) to function properly. The new features are:

- SAS/GRAPH support for the `javaimg` device
- The SAS REPORT procedure

Please refer to the section entitled "Configuring SAS Software for Use with the Java Platform" in the *Configuration Guide for SAS 9.1.3 Foundation for z/OS* for configuration details.

If you are using either of these features, determine that you have at least the following version or release of the Software Development Kit: SDK Version: 1.4.1 SR1, which also requires z/OS V1R4.

This is the version of the SDK that SAS has tested and supports. Later patch-levels and versions of this SDK may work; however, they have not been tested by SAS.

You can check SAS's third party support Web page for information about the latest supported version of the SDK for z/OS at <http://support.sas.com/thirdpartysupport>.

Additional Requirements

SAS 9.1.3 Foundation for z/OS uses IBM's USS Assembler Callable Service BPX1MPC to prevent A03 abends. This facility will not work unless BPXPRMPC is at maintenance level UW89958 or above on the z/OS system where SAS is running.

Hardware Requirements

Note: *If there are only limited tape drive resources available for the installation of SAS 9.1.3 Foundation, then refer to the section **Enabling minimal cartridge mounts from a Multi 3480 cart media** in the **Installation Instructions for SAS 9.1.3 Foundation for z/OS**.*

Machines Supported

- S/390 architecture machines and compatibles
- zSeries architecture machines and compatibles

Tape Drives Supported

SAS uses standard operating system access methods to read/write tape files, and will operate with any tape drive that can be used by these access methods. This includes:

- IBM 3480 compatible drives.
- IBM 3490 compatible drives.
- IBM 3590 compatible drives.

SAS does not support use of tape block sizes that exceed 32 KB.

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 SAS 9.1.3 Foundation 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.

SAS 9.1.3 use of below-the-line storage is substantially less than was required for SAS 9.0. 4 MB of below-the-line storage should be adequate for most batch jobs and TSO sessions.

Programs that utilize AF and SCL program entries may require additional region size in SAS 9.1.3 to exploit the various functions of the product. Examples of SAS products which may require a larger region are SAS/ASSIST and SAS/ITRM. Refer to the "Specific Product Requirements" section for the recommended REGION size for these products.

Note: This may also be necessary for user-written AF and SCL programs. For these, the site **must** determine what an appropriate REGION is.

If you install the SAS bundles into the 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 *Configuration Guide for SAS 9.1.3 Foundation for z/OS*.

No below-the-line storage is required for any of the LPA bundles.

Java Requirements

- A G5 or later processor is required.
- IEEE floating point support is required.
- SAS sessions that invoke the JAVA virtual machine will require a much larger region. The JVM will typically add approximately 250 MB to the region requirement.

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 for SAS 9.1.3 Foundation are 49,879 3390 tracks (or equivalent) equating to 2,258 MB.

After the installation of the SAS software is complete, any unused space will be released back to the system.

Note: This estimate does not include approximately 2,000 additional tracks that are required on your installation volume for a temporary cataloged DATALIB used during SAS 9.1.3 Foundation install. This additional space will be released at the conclusion of the install.

Specific Product Requirements

SAS/ACCESS Interface to Adabas Software

Products Required

- Base SAS software
- 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-Datcom/DB Software

Products Required

- Base SAS software
- SAS/ACCESS Interface to CA-Datcom/DB software

DBMS Products Required

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

SAS/ACCESS Interface to CA-IDMS Software

Products Required

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

DBMS Products Required: CA-IDMS, Release 14.0 or subsequent releases

SAS/ACCESS Interface to DB2 Software

Products Required

- Base SAS software
- SAS/ACCESS Interface to DB2 software

DBMS Products Required: DB2, Release 6.1 or subsequent releases

SAS/ACCESS Interface to IMS-DL/I Software

Products Required

- Base SAS software
- SAS/ACCESS Interface to IMS-DL/I software

DBMS Products Required: IMS/VS, Version 6.1 or subsequent versions

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.

The minimum required Oracle client release is: Oracle 9i

Note: *Beginning with SAS 9.1.3 Service Pack 3, the Oracle 8i client is no longer supported. If you want to continue using the Oracle 8i client, you will have to maintain your SAS 9.1.3 software at the Service Pack 2 level.*

Note: *Oracle no longer supports the Oracle 8i client. Especially if you are running z/OS 1.6 or a later version, you must upgrade your SAS applications that access Oracle databases to SAS 9.1.3 Service Pack 3.*

SAS/ACCESS Interface to R/3 Software

Note: *The graphical user interface of the SAS/ACCESS Interface to R/3 is not supported on z/OS.*

Products Required

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

Additional functionality is obtained if the following products are installed:

- SAS/CONNECT software
- SAS/SHARE software

SAP R/3 Products Required: SAP Kernel Release 4.6C or higher

The SAS RFC Server requires the SAP RFC library which is provided by SAP AG. Refer to SAP Note 413708 for the current version, download and installation instructions.

For Windows, the recommended installation method is to install the SAP GUI or the RFC SDK.

For the RFC servers on Windows, z/OS, and Linux, download the 32-bit version; for all other platforms, download the 64-bit version of the RFC library.

For the Unicode RFC server, download the Unicode RFC library and the shared libraries required by the Unicode RFC library.

SAS/ACCESS Interface to System 2000 Software

Products Required

- Base SAS software
- 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

Products Required

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

DBMS Products Required

- Teradata RDBMS Server, Version 2, Release 2 (V2R2) or higher
- CLIV2 libraries on the machine where you run SAS and SAS/ACCESS Interface to Teradata. CLIV2 is part of Teradata Utilities Foundation (TUF) software. If you are running any Teradata Utility (BTEQ, FastLoad, MultiLoad, FastExport, TPump), then CLIV2 is already on your machine.

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

SAS Activity-Based Management Software

The following products are included in SAS Activity-Based Management Data Integration and Enterprise BI Server. Unless explicitly licensed, use of this software is limited to SAS Activity-Based Management Data Integration and Enterprise BI Server.

- Base SAS software
- SAS/ACCESS engine of choice
- SAS/ACCESS Interface to PC Files
- SAS/CONNECT
- SAS/GRAPH
- SAS Integration Technologies software
- SAS OLAP Server

The following products are included in SAS Activity-Based Management Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Activity-Based Management Metadata Server.

- Base SAS software
- SAS Metadata Server software

SAS/ASSIST

Products Required: Base SAS software

Memory Requirements

Due to the increased storage requirements for SAS 9 and above, it may be necessary to increase the default above-the-line REGION to 64 MB.

SAS Banking Intelligence Architecture Software

SAS Banking Intelligence Architecture EBI Server

The following products are included in SAS Banking Intelligence Architecture EBI Server. Unless explicitly licensed, use of this software is limited to SAS Banking Intelligence Architecture EBI Server.

- Base SAS software
- SAS Integration Technologies software
- SAS OLAP Server software
- SAS/STAT software

SAS Banking Intelligence Architecture Metadata Server

The following products are included in SAS Banking Intelligence Architecture Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Banking Intelligence Architecture Metadata Server.

- Base SAS software
- SAS/CONNECT software
- SAS Integration Technologies software

SAS Banking Intelligence Architecture OLAP Server

The following products are included in SAS Banking Intelligence Architecture OLAP Server. Unless explicitly licensed, use of this software is limited to SAS Banking Intelligence Architecture OLAP Server.

- Base SAS software
- SAS Integration Technologies
- SAS OLAP Server

Base SAS Software

Requirements for SPD Engine on z/OS

General guidelines for a minimum computer system to support SPD Engine include:

- UNIX file system (zFS)
- Applicable maintenance from the following list of PSP (preventive service planning) buckets corresponding to your z/OS release level:

Upgrade	Subset
ZOSV1R2	ZFS
ZOSV1R3	DFSSMB
ZOSV1R4	DFSSMB
ZOSV1R5	DFSSMB

SAS BI Server

SAS BI Server

Products Included in SAS BI Server:

- Base SAS software
- SAS/GRAPH software
- SAS Integration Technologies software

SAS BI Server Metadata Server

Products Included in SAS BI Server Metadata Server:

- Base SAS software
- SAS Metadata Server software

SAS Campaign Management Software

The following products are included in SAS Campaign Management Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Campaign Management Metadata Server.

- Base SAS software
- SAS Metadata Server software

SAS/CONNECT Software

TCP/IP Access Method

To use the TCP/IP access method, you need the SAS C Transient Library shipped with this version of SAS 9.1.3 Foundation and one of the following TCP/IP packages:

- Computer Associates TCPAccess 5.3 or later
- IBM OS/390 V2R10 TCP/IP or later

The z/OS Spawner can be used with the TCP/IP access method to establish connections to a remote z/OS host.

Components Required

- Version 9 SAS SVC Routine, except for Basic Telnet SAS/CONNECT Session.
- Refer to Chapter 1, Setting Up SAS 9.1.3 Foundation in the *Configuration Guide for SAS 9.1.3 Foundation for z/OS* for information on the Version 9 SAS SVC Routine.

SAS Cross-Sell and Up-Sell for Banking Software

The following products are included in SAS Cross-Sell and Up-Sell for Banking Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Cross-Sell and Up-Sell for Banking Metadata Server.

- Base SAS software
- SAS Metadata Server software

SAS Customer Retention for Banking Software

The following products are included in SAS Customer Retention for Banking Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Customer Retention for Banking Metadata Server.

- Base SAS software
- SAS Metadata Server software

SAS Customer Segmentation for Banking Software

The following products are included in SAS Customer Segmentation for Banking Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Customer Segmentation for Banking Metadata Server.

- Base SAS software
- SAS Metadata Server software

SAS Data Integration Server

SAS Data Integration Server

Products Included in SAS Data Integration Server:

- Base SAS software
- SAS/CONNECT software
- SAS Integration Technologies software

SAS Data Integration Server Metadata Server

Products Included in SAS Data Integration Server Metadata Server:

- Base SAS software
- SAS/Connect software
- SAS Integration Technologies software
- SAS Metadata Server software

SAS Data Quality Server Software

Memory

The memory requirements for SAS Data Quality Server software are dependent upon the complexity of the data and the number of locales loaded from the Quality Knowledge Base at one time. 100 MB of memory is recommended per locale.

SAS Data Surveyor for Oracle

An installation of SAS Data Surveyor for Oracle requires one of the following products as a prerequisite:

- SAS Data Integration Server
- SAS Enterprise Data Integration Server
- Any solution containing SAS Data Integration Studio

SAS Data Surveyor for Oracle contains SAS/ACCESS Interface to Oracle. When determining the file space required for this product from the file size tables, use only the figure for SAS/ACCESS Interface to Oracle.

SAS Data Surveyor for PeopleSoft

An installation of SAS Data Surveyor for PeopleSoft requires one of the following products as a prerequisite:

- SAS Data Integration Server
- SAS Enterprise Data Integration Server
- Any solution containing SAS Data Integration Studio

SAS Data Surveyor for PeopleSoft contains a SAS/ACCESS engine of your choice. When determining the file space required for this product engine from the file size tables, use only the figure for your chosen SAS/ACCESS.

SAS Data Surveyor for SAP

An installation of SAS Data Surveyor for SAP requires one of the following products as a prerequisite:

- SAS Data Integration Server
- SAS Enterprise Data Integration Server
- Any solution containing SAS Data Integration Studio

SAS Data Surveyor for SAP contains SAS/ACCESS Interface to R/3 and SAS/ACCESS Interface to SAP BW. When determining the file space required for this product from the file size tables, use only the figures for these two SAS/ACCESS products.

SAS Data Surveyor for Siebel

An installation of SAS Data Surveyor for Siebel requires one of the following products as a prerequisite:

- SAS Data Integration Server
- SAS Enterprise Data Integration Server
- Any solution containing SAS Data Integration Studio

SAS Data Surveyor for Siebel contains a SAS/ACCESS engine of your choice. When determining the file space required for this product from the file size tables, use only the figure for your chosen SAS/ACCESS engine.

SAS Digital Marketing

The following products are included in SAS Digital Marketing SAS Server. Unless explicitly licensed, use of this software is limited to SAS Digital Marketing SAS Server.

- Base SAS software
- SAS/GRAPH software
- SAS Integration Technologies software
- SAS/SHARE software

SAS Enterprise BI Server

SAS Enterprise BI Server

Products Included in SAS Enterprise BI Server:

- Base SAS software
- SAS/GRAPH software
- SAS Integration Technologies software
- SAS OLAP Server software

SAS Enterprise BI Server Metadata Server

Products Included in SAS Enterprise BI Server Metadata Server:

- Base SAS software
- SAS Metadata Server software

SAS Enterprise Data Integration Server

SAS Enterprise Data Integration Server

Products Included in SAS Enterprise Data Integration Server:

- Base SAS software
- SAS/ACCESS software of choice
- A second SAS/ACCESS software of choice
- SAS/CONNECT software
- SAS Data Quality Server and a Quality Knowledge Base of choice
- SAS Integration Technologies software
- SAS/SHARE software

SAS Enterprise Data Integration Server Metadata Server

Products Included in SAS Enterprise Data Integration Server Metadata Server:

- Base SAS software
- SAS/Connect software
- SAS Integration Technologies software
- SAS Metadata Server software

SAS Enterprise Intelligence Suite for Education

SAS Enterprise Intelligence Suite Server

The following products are included in SAS Enterprise Intelligence Suite Server. Unless explicitly licensed, use of this software is limited to SAS Enterprise Intelligence Suite Server.

- Base SAS software
- Quality Knowledge Base locale of choice
- SAS/ACCESS engine of choice
- A second SAS/ACCESS engine of choice
- SAS/CONNECT software
- SAS Data Quality Server software
- SAS/ETS software
- SAS/GRAPH software
- SAS/IML software
- SAS/INSIGHT software
- SAS Integration Technologies software
- SAS OLAP Server software
- SAS/SHARE software
- SAS/STAT software

SAS Enterprise Intelligence Suite Metadata Server

The following products are included in SAS Enterprise Intelligence Suite Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Enterprise Intelligence Suite Metadata Server.

- Base SAS software
- SAS/Connect software
- SAS Metadata Server software

SAS Enterprise Intelligence Suite OLAP Server

The following products are included in SAS Enterprise Intelligence Suite OLAP Server. Unless explicitly licensed, use of this software is limited to SAS Enterprise Intelligence Suite OLAP Server.

- Base SAS software
- SAS/AF
- SAS/GRAPH
- SAS Integration Technologies
- SAS OLAP Server

SAS Enterprise Management for Six Sigma Software

The following products are included in SAS Enterprise Management for Six Sigma Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Enterprise Management for Six Sigma Metadata Server.

- Base SAS software
- SAS Metadata Server software

SAS Enterprise Miner 4.3

Base SAS software and SAS/STAT software are prerequisites for the installation of SAS Enterprise Miner Server.

The following products are included in SAS Enterprise Miner Server 4.3. Unless explicitly licensed, use of this software is limited to SAS Enterprise Miner Server.

- SAS Enterprise Miner Software
- SAS/CONNECT software
- SAS/ETS software
- SAS/GRAPH software
- SAS Integration Technologies software

Memory for SAS Enterprise Miner Server 4.3

The memory requirements for SAS Enterprise Miner 4.3 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.

SAS Forecast Server Software

SAS Forecast Server Metadata Server

Products Included in SAS Forecast Server Metadata Server:

- Base SAS software
- SAS Metadata Server software

SAS Fraud Management Software

SAS Fraud Management Server – SAS OnDemand Scoring Engine

Products Required

- Base SAS software
- SAS/ACCESS engine of choice
- SAS Fraud Management Transaction Extensions software
- SAS OnDemand Scoring Engine software

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

Note: See “Graphics Hardware and Software Compatibility” on page 24 for detailed information about SAS/GRAPH hardware and software compatibility requirements.

SAS Grid Manager Software

SAS Grid Server Metadata Server

The following products are included in SAS Grid Server Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Grid Server Metadata Server.

- Base SAS software
- SAS Metadata Server software

SAS High-Performance Forecasting Software

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

Products Included in SAS High-Performance Forecasting:

- SAS High-Performance Forecasting software
- SAS/OR software (unless explicitly licensed, use of SAS/OR is limited to SAS High-Performance Forecasting)

SAS Information Delivery Portal

Base SAS software is a prerequisite for the installation of SAS Information Delivery Portal Server.

The following product is included in SAS Information Delivery Portal Server. Unless explicitly licensed, use of this software is limited to SAS Information Delivery Portal Server.

- SAS Integration Technologies software

SAS Insurance Intelligence Architecture Software

SAS Insurance Intelligence Architecture EBI Server

The following products are included in SAS Insurance Intelligence Architecture EBI Server. Unless explicitly licensed, use of this software is limited to SAS Insurance Intelligence Architecture EBI Server.

- Base SAS software
- SAS Integration Technologies software
- SAS OLAP Server software
- SAS/STAT software

SAS Insurance Intelligence Architecture Metadata Server

The following products are included in SAS Insurance Intelligence Architecture Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Insurance Intelligence Architecture Metadata Server.

- Base SAS software
- SAS/CONNECT software
- SAS Integration Technologies software

SAS Insurance Intelligence Architecture OLAP Server

The following products are included in SAS Insurance Intelligence Architecture OLAP Server. Unless explicitly licensed, use of this software is limited to SAS Insurance Intelligence Architecture OLAP Server.

- Base SAS software
- SAS Integration Technologies
- SAS OLAP Server

SAS Integration Technologies Software

Components Required

- Version 9 SAS SVC Routine
- Refer to Chapter 1, Setting Up SAS 9.1.3 Foundation in the *Configuration Guide for SAS 9.1.3 Foundation for z/OS* for information on the Version 9 SAS SVC Routine.

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 9.1.3 Foundation media. Other SAS/IntrNet software components may be installed from the Client-Side Components CD.

All SAS/IntrNet components require the use of TCP/IP. One of the following versions of TCP/IP is required:

- Computer Associates TCPAccess 5.3 or later
- IBM OS/390 V2R10 TCP/IP or later

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 the same machine as the Web server. Use of the Pool Services feature requires the installation of the OS/390 Spawner.

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 z/OS Spawner. 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 Inventory Optimization

Base SAS is a prerequisite for the installation of SAS Inventory Replenishment Planning.

The following products are included in SAS Inventory Optimization Server software. Unless explicitly licensed, use of this software is limited to SAS Inventory Optimization Server.

- SAS Inventory Optimization software
- SAS Integration Technologies software

SAS IT Management Adapter for SAP Software

SAS IT Management Adapter for SAP requires Base SAS software and SAS IT Resource Management Server software to be installed. In addition, it requires SAP R/3 (release 4.5B or higher) to be installed prior to the installation of the Adapter itself.

The following products are included in SAS IT Management Adapter for SAP software. Unless explicitly licensed, use of this software is limited to SAS IT Management Adapter for SAP.

- SAS IT Management Adapter for SAP software
- SAS/ACCESS Interface to R/3 software
- SAS/ACCESS Interface to SAP BW software

SAS IT Resource Management Server Software

The following products are included in SAS IT Resource Management Server. Unless explicitly licensed, use of this software is limited to SAS IT Resource Management Server.

- SAS IT Resource Management Server software
- Base SAS software
- 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 IT Management Solutions Core Components MVA Data software

- SAS/MDDDB Server software
- SAS/SHARE software
- SAS/STAT software

Other Requirements for SAS IT Resource Management Server:

- Adobe Reader is required for some online documents supplied in printable form.
- SAS IT Resource Management 2.7 requires a screen resolution of at least 800x600. If your display is set to a lower screen resolution, some windows may be truncated to fit the screen. If you experience font display problems, you may want to use the default SAS font. To set the default font type, issue the SAS command `dlgfont` at the command prompt. In the Font window, select the font `Sasfont`, a style of regular, and font size 10.
- SAS IT Resource Management 2.7 requires an Xwindows device that supports 256 or more colors.
- Jobs that invoke SAS IT Resource Management 3.1 will inherently start a Java virtual machine which requires a larger region. The recommended minimum region size is 350 MB, or 358400K.
- The RACF profile of **ALL** user IDs accessing the z/OS Workspace Server for the purposes of running SAS IT Resource Management 3.1 jobs must have a RACF OMVS segment and be allowed an address space size of at least 350 MB. This is specified in the user's RACF OMVS segment `ASSIZEMAX` parameter as 367001600, or in the system-wide setting of `MAXASSIZE` defined in `SYS1.PARMLIB (BPXPRMxx)`.

SAS IT Service Level Management Server Software

SAS IT Resource Management Server is a prerequisite for the installation of SAS IT Service Level Management Server.

The following products are included in SAS IT Service Level Management Server. Unless explicitly licensed, use of this software is limited to SAS IT Service Level Management Server.

- SAS IT Service Level Management software
- SAS/IntrNet software

SAS/LAB Software

Products Required

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

SAS Manufacturing Intelligence Architecture Software

SAS Manufacturing Intelligence Architecture EBI Server

The following products are included in SAS Manufacturing Intelligence Architecture EBI Server. Unless explicitly licensed, use of this software is limited to SAS Manufacturing Intelligence Architecture EBI Server.

- Base SAS software
- SAS Integration Technologies software
- SAS OLAP Server software
- SAS/STAT software

SAS Manufacturing Intelligence Architecture Metadata Server

The following products are included in SAS Manufacturing Intelligence Architecture Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Manufacturing Intelligence Architecture Metadata Server.

- Base SAS software
- SAS/CONNECT software
- SAS Integration Technologies software

SAS Manufacturing Intelligence Architecture OLAP Server

The following products are included in SAS Manufacturing Intelligence Architecture OLAP Server. Unless explicitly licensed, use of this software is limited to SAS Manufacturing Intelligence Architecture OLAP Server.

- Base SAS software
- SAS Integration Technologies
- SAS OLAP Server

SAS Marketing Optimization Software

The following products are included in SAS Marketing Optimization Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Marketing Optimization Metadata Server.

- Base SAS software
- SAS Metadata Server software

Marketmax Base and Performance Analysis and Micromarketing Software

The following products are included in Marketmax Base and Performance Analysis and Micromarketing Metadata Server. Unless explicitly licensed, use of this software is limited to Marketmax Base and Performance Analysis and Micromarketing Metadata Server.

- Base SAS software
- SAS/CONNECT software
- SAS Integration Technologies software
- SAS Metadata Server software

SAS Metadata Server Software

Products Required

- Base SAS software
- SAS/CONNECT

SAS OLAP Server Software

Base SAS software is a prerequisite for the installation of SAS OLAP Server software.

The following products are included in SAS OLAP Server software. Unless explicitly licensed, use of this software is limited to SAS OLAP Server.

- SAS OLAP Server software
- SAS/AF software

- SAS/GRAPH software
- SAS Integration Technologies software

Memory

The memory requirements for SAS OLAP Server software are dependent upon the complexity of the hierarchies generated. A minimum of 512 MB of memory is required.

Large applications will see performance improvements with more available memory.

SAS OpRisk Monitor Software

The following products are included in SAS OpRisk Metadata Server. Unless explicitly licensed, use of this software is limited to SAS OpRisk Metadata Server.

- SAS Metadata Server software
- Base SAS software
- SAS/CONNECT software
- SAS Integration Technologies software

SAS OpRisk VaR Software

The following products are included in SAS OpRisk Metadata Server. Unless explicitly licensed, use of this software is limited to SAS OpRisk Metadata Server.

- SAS Metadata Server software
- Base SAS software
- SAS/CONNECT software
- SAS Integration Technologies software

Portal Server Components

The following products are included in Portal Server Components. Unless explicitly licensed, use of this software is limited to Portal Server Components.

- Base SAS software
- SAS Integration Technologies software

SAS Profitability Management Software

The following products are included in SAS Profitability Management Data Integration and BI Server. Unless explicitly licensed, use of this software is limited to SAS Profitability Management Data Integration and BI Server.

- Base SAS software
- SAS/ACCESS engine of choice
- SAS/ACCESS Interface to PC Files software
- SAS/CONNECT software
- SAS/GRAPH software
- SAS Integration Technologies software

SAS Retail Intelligence Architecture Software

SAS Retail Intelligence Architecture EBI Server

The following products are included in SAS Retail Intelligence Architecture EBI Server. Unless explicitly licensed, use of this software is limited to SAS Retail Intelligence Architecture EBI Server.

- Base SAS software
- SAS Integration Technologies software
- SAS OLAP Server software
- SAS/STAT software

SAS Retail Intelligence Architecture Metadata Server

The following products are included in SAS Retail Intelligence Architecture Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Retail Intelligence Architecture Metadata Server.

- Base SAS software
- SAS/CONNECT software
- SAS Integration Technologies software

SAS Retail Intelligence Architecture OLAP Server

The following products are included in SAS Retail Intelligence Architecture OLAP Server. Unless explicitly licensed, use of this software is limited to SAS Retail Intelligence Architecture OLAP Server.

- Base SAS software
- SAS Integration Technologies
- SAS OLAP Server

SAS/SESSION Software

Products Required

- CICS/ESA, Version 3, Release 3 or subsequent versions
- VTAM/ESA, Version 4, Release 3 or subsequent versions

SAS/SHARE Software

Products Required: Base SAS software

Components Required

- Version 9 SAS SVC Routine
- Refer to Chapter 1, Setting Up SAS 9.1.3 Foundation in the Configuration Guide for SAS 9.1.3 Foundation for z/OS for information on the Version 9 SAS SVC Routine.

TCP/IP Access Method

To use the TCP/IP access method, you need the SAS C Transient Library shipped with this version of SAS 9.1.3 Foundation and one of the following TCP/IP packages:

- Computer Associates TCPAccess 5.3 or later
- IBM OS/390 V2R10 TCP/IP or later

Security System

A security system is required for z/OS SAS/SHARE sites making use of the cross-host or cross-architecture capabilities available in Release 6.08, TS410 and beyond. This requirement may be met by any of the following:

- IBM Security Server for OS/390.
- IBM Security Server for z/OS.
- Any Security system that provides support equivalent to these servers via the SAF system interface.

SAS Sourcing Data Quality Software

The following products are included in SAS Sourcing Data Quality Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Sourcing Data Quality Metadata Server.

- Base SAS software
- SAS Metadata Server software

SAS Space Optimizer Software

The following products are included in SAS Space Optimizer SAS Server. Unless explicitly licensed, use of this software is limited to SAS Space Optimizer SAS Server.

- Base SAS software
- SAS/GRAPH software
- SAS/OR software

SAS Space Planning Software

The following products are included in SAS Space Planning SAS Server. Unless explicitly licensed, use of this software is limited to SAS Space Planning SAS Server.

- Base SAS software
- SAS/GRAPH software

SAS Spend Analysis Software

The following products are included in SAS Spend Analysis Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Spend Analysis Metadata Server.

- Base SAS software
- SAS Metadata Server software

SAS StoreCAD Plus Software

SAS StoreCAD Plus software requires SAS Space Planning.

The following products are included in SAS StoreCAD Plus. Unless explicitly licensed, use of this software is limited to SAS StoreCAD Plus.

- SAS StoreCAD Plus software

SAS Telecommunications Intelligence Architecture Software

SAS Telecommunications Intelligence Architecture EBI Server

The following products are included in SAS Telecommunications Intelligence Architecture EBI Server. Unless explicitly licensed, use of this software is limited to SAS Telecommunications Intelligence Architecture EBI Server.

- Base SAS software
- SAS Integration Technologies software
- SAS OLAP Server software
- SAS/STAT software

SAS Telecommunications Intelligence Architecture Metadata Server

The following products are included in SAS Telecommunications Intelligence Architecture Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Telecommunications Intelligence Architecture Metadata Server.

- Base SAS software
- SAS/CONNECT software
- SAS Integration Technologies software

SAS Telecommunications Intelligence Architecture OLAP Server

The following products are included in SAS Telecommunications Intelligence Architecture OLAP Server. Unless explicitly licensed, use of this software is limited to SAS Telecommunications Intelligence Architecture OLAP Server.

- Base SAS software
- SAS Integration Technologies
- SAS OLAP Server

SAS Value Chain Analytics Software

The following products are included in SAS Value Chain Analytics ETL and BI Server. Unless explicitly licensed, use of this software is limited to SAS Value Chain Analytics ETL and BI Server.

- Base SAS software
- SAS/ACCESS engine of choice
- SAS/ACCESS Interface to PC Files software
- SAS/AF software
- SAS/CONNECT software
- SAS/GRAPH software
- SAS Integration Technologies software
- SAS OLAP Server software

The following products are included in SAS Value Chain Analytics Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Value Chain Analytics Metadata Server.

- Base SAS software
- SAS Metadata Server software

SAS Visual Data Discovery Software

SAS Visual Data Discovery Server

The following products are included in SAS Visual Data Discovery Server. Unless explicitly licensed, use of this software is limited to SAS Visual Data Discovery Server.

- Base SAS software
- SAS/ACCESS engine of choice
- SAS/GRAPH software
- SAS Integration Technologies software
- SAS/STAT software

SAS Visual Data Discovery Metadata Server

The following products are included in SAS Visual Data Discovery Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Visual Data Discovery Metadata Server.

- Base SAS software

SAS Warranty Analysis Software

The following products are included in SAS Warranty Analysis Metadata Server. Unless explicitly licensed, use of this software is limited to SAS Warranty Analysis Metadata Server.

- Base SAS software
- SAS/CONNECT software
- SAS Integration Technologies software
- SAS Metadata Server software

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:

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

Interfaces with other Graphics Software

SAS/GRAPH software provides device drivers to create output in various graphics file formats, such as HP-GL, PostScript, Encapsulated PostScript, CGM, 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).

Please refer to the following Web site for several z/OS-specific SAS/GRAPH examples:

<http://support.sas.com/documentation/hosts/mainframe/zos/tips/index.html>.

Requirements for ActiveX and Java Graphics

The ActiveX and Java device drivers allow you to create HTML pages from within SAS 9.1.3 Foundation. Before you can do this, please verify that:

- Your system meets the JDK requirements (see “Java Requirements” on page 1).
- You have set up the JREOPTIONS (refer to the section entitled “Configuring SAS Software for Use with the Java Platform” in the *Configuration Guide for SAS 9.1.3 Foundation for z/OS*).

For a list of supported browsers, refer to the *System Requirements* documentation for your client system.

To view the Java applets, the Java plug-in must be installed on each client machine. On Windows systems, the user can install the plug-in when prompted if it is not already installed. On other systems, the plug-in can be installed from one of the Third Party Software Components CDs. Follow the instructions included with the Java and Web browser installation for your system to enable the Java plug-in.



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