System Requirements for SAS® 9.4 Foundation for Solaris for x64

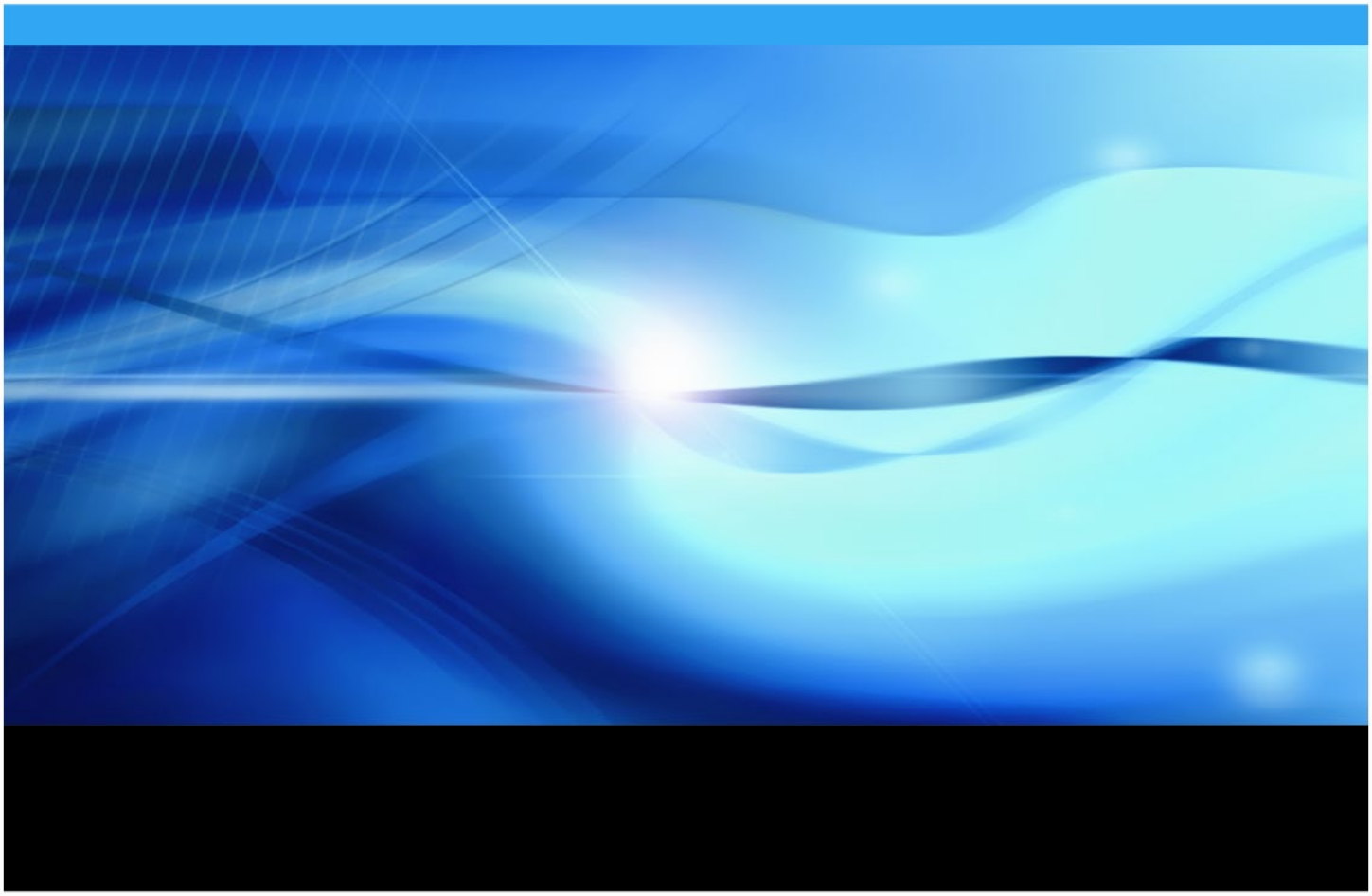

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Table of Contents

Overview 1
Additional Resources 1
Configuring Your I/O Subsystem 1
Support for Alternative Operating Systems 1
Troubleshooting System Performance Problems 1
Maintenance Releases and Third-Party Support 1
Software Requirements 2
Operating System 2
Java Requirements 3
Security Requirements 3
Anti-Virus, Endpoint-Protection, and System-Monitoring Software 3
Web Browsers 4
Remote Browsing 4
Hardware Requirements 5
Machines Supported 5
Distribution Media 5
System Configuration 5
Desktop Systems 5
Server Systems 6
Displays Supported 6
Space Requirements 6
Specific Product Requirements 7
Base SAS Software 7
Requirements for SPD Engine on Solaris 7
SAS Micro Analytic Service 7
Support for Data Storage in Amazon S3 7
SAS Grid Products 7
SAS Analytics Accelerator for Teradata 8
SAS In-Database Code Accelerator for Greenplum 8
SAS In-Database Code Accelerator for Hadoop 9
SAS In-Database Code Accelerator for Teradata 10
SAS Scoring Accelerator for DB2 11
SAS Scoring Accelerator for Greenplum 11
SAS Scoring Accelerator for Hadoop 12
SAS Scoring Accelerator for Oracle 12
SAS Scoring Accelerator for SAP HANA 13
SAS Scoring Accelerator for SPD Server 14
SAS Scoring Accelerator for Teradata 14
SAS/ACCESS Interface to Amazon Redshift 15
SAS/ACCESS Interface to DB2 15
SAS/ACCESS Interface to Greenplum 15
SAS/ACCESS Interface to Hadoop 16

SAS/ACCESS Interface to HAWQ **16**
SAS/ACCESS Interface to JDBC **17**
SAS/ACCESS Interface to Microsoft SQL Server **17**
SAS/ACCESS Interface to MySQL **17**
SAS/ACCESS Interface to ODBC **18**
SAS/ACCESS Interface to Oracle **18**
SAS/ACCESS Interface to PC Files **19**
SAS/ACCESS Interface to the PI System **19**
SAS/ACCESS Interface to PostgreSQL **20**
SAS/ACCESS Interface to SAP ASE **20**
SAS/ACCESS Interface to SAP HANA **20**
SAS/ACCESS Interface to SAP IQ **21**
SAS/ACCESS Interface to Teradata **21**
SAS/AF **22**
Products Required for Build Mode 22
Products Required for Run Mode 22
Printers 23
SAS/EIS **23**
Products Required for Build Mode 23
Products Required for Run Mode 23
Memory 23
Printers 23
SAS/Genetics **23**
SAS/GIS **23**
Products Required for Build Mode 23
Products Required for Run Mode 24
Printers 24
SAS/IntrNet **24**
CGI Tools and Applications 24
Java Tools and Applications 24
SAS/OR **25**

Overview

***Important**:* *Starting with SAS 9.4M9 (TS1M9), SAS Foundation is not available on Oracle Solaris. In order to move forward to SAS 9.4M9, you can promote your content to SAS 9.4M9 installed on one of the available operating environments, or you can migrate to SAS 9.4M9 installed on a machine that is running an available operating system in the same family. For the UNIX operating system family, options such as Red Hat Enterprise Linux are available. Consult the corresponding SAS Foundation System Requirements and Configuration Guide for the operating system that you select.*

For more information, see the Knowledge Base Article KB0039398.

This document provides requirements for installing and running SAS 9.4 Foundation for Oracle Solaris. Most requirements in this document were last updated for SAS 9.4M8 (TS1M8). The requirements in the Hardware Requirements section are new in 2025, based on recent testing.

You must update your system to meet the minimum requirements before running SAS 9.4 Foundation. The major requirements listed in the document are as follows:

- Software Requirements
- Hardware Requirements
- Space Requirements
- Specific Product Requirements

Additional Resources

Configuring Your I/O Subsystem

SAS recommends the white paper titled *Best Practices for Configuring your I/O Subsystem for SAS 9 Applications.* You can access it here:
https://support.sas.com/resources/papers/proceedings16/SAS6761-2016.pdf.

Support for Alternative Operating Systems

This document lists the operating systems deployed by SAS in testing the software. Additional operating systems may also be supported. For information about variants of operating systems that are alternatives to the list that SAS identifies as officially supported, see
https://support.sas.com/techsup/pcn/altopsys.html.

Troubleshooting System Performance Problems

For a list of papers that are useful for troubleshooting system performance problems, see
https://support.sas.com/kb/42/197.html.

Maintenance Releases and Third-Party Support

***Note**:* *SAS 9.4M0 through 9.4M6 entered Limited Support from SAS in February 2025.*

If you do not upgrade SAS 9.4 Foundation with each maintenance release, you are assuming risks beyond potentially running SAS software that might no longer be receiving security and bug fixes. Your SAS 9.4 maintenance level might be able to run only against versions of third-party database

technologies that are no longer supported by the third-party vendor. If your SAS software is under Standard Support but the third-party software has reached end of life, SAS might not be able to assist you or address issues because the vendor is no longer providing assistance.

In these cases, SAS might move a SAS product's support to Limited Support. For the official SAS support policy regarding the loss of vendor support, see:

https://support.sas.com/en/technical-support/services-policies/policies-for-sas-products.html#vendors.

For more information about SAS Technical Support, visit https://support.sas.com/techsup/.

Software Requirements

Operating System

With SAS 9.4M8, SAS is supported on Oracle Solaris 11.4 or later on x64. Previous releases support Solaris 10 Update 9 and Solaris 11 and later on x64. To verify version compatibility, see the SAS 9.4 Operating System Compatibility page.

To determine which Solaris release you are running, look at the `/etc/release` file using the `% cat /etc/release` command.

If you are installing or running SAS 9.4 on Solaris 11, SAS requires that you install the Solaris `compatibility/ucb` and `system/xopen/xcu4` packages. You can download these packages from this location: http://pkg.oracle.com/solaris/release/en/index.shtml

Solaris 11.4 also imposes CPU minimum requirements that differ from those that applied to Solaris 10. The Oracle Solaris 11.4 Release Notes states, "Oracle Solaris 11.4 supports systems based on the Oracle SPARC T4 or later processors; the Fujitsu SPARC64 X, X+, or XII processors; or x64 CPUs supporting either the Intel EM64T or AMD AMD64 instruction sets."

The following Solaris packages must be installed in order to enable the SAS Deployment Wizard to run properly:

- dejavu
- freetype

You can install these packages by running the following commands:

```
pkg install system/library/freetype-2
```

```
pkg install font/truetype/dejavu
```

The Sun Performance Libraries, which include BLAS and LAPACK routines, require installation of the SUNWlibmsr, SUNWcslr, and SUNWpiclu packages on your system.

Note: *The patch levels listed were correct at the time this document was published. However, patches that are required for Solaris are subject to unexpected change. To ensure you have the latest patch requirements, go to the Install Center web page (*http://support.sas.com/installcenter*) to find the most recent updates to this System Requirements document.*

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

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

Java Requirements

For information about Java Runtime Environment (JRE) requirements, refer to the SAS 9.4 Support for Java web page.

Security Requirements

With SAS 9.4M8, SAS Foundation servers use the cryptographic libraries that are available from the operating systems supported by SAS. Each SAS-supported cipher suite might not be available from all operating systems. If this issue is encountered, use a cipher suite that is supported by both SAS and that operating system, or install a third-party SSL provider for use by SAS.

For more information, see *Encryption in SAS 9.4*.

Anti-Virus, Endpoint-Protection, and System-Monitoring Software

The configuration and activities of security software can interfere with SAS applications or even prevent them from executing.

Anti-virus scanning can cause issues by locking files that are used for SAS operations. To prevent such disruptions, SAS strongly recommends that you exclude SAS applications from live virus scanning. For example, you can add SAS executables and known file extensions (such as *.sas7bdat, *.lck, *.sas) to a list of files to exclude from scanning. SAS also recommends that you exclude the ports that are used by SAS Foundation and SAS solutions from port-scanning activities.

Endpoint protection software can stop SAS applications from running. System-monitoring applications seem to be less likely to disrupt SAS, but when these applications undergo changes, such as during routine maintenance, they can cause issues.

SAS recommends that you temporarily disable all actively running security software when performing SAS installation, configuration, and software maintenance tasks.

If your SAS deployment stops working (especially on a recurring basis) consider whether conflicts with actively running security software could be the root cause. You might be able to resolve these issues quickly by taking one or more of the following troubleshooting steps:

- Investigate whether other applications that are not SAS are also affected.
- Use nmon, collect-l, or top to find out which resources are actively used by the security products.
- Temporarily disable each active security program, one at a time, to determine whether they are causing the disruptions to SAS or to other applications.

As described in the SAS Technical Support General Support policy regarding third-party software, SAS Technical Support will convey any knowledge that it has, but cannot provide support for another vendor's software.

Web Browsers

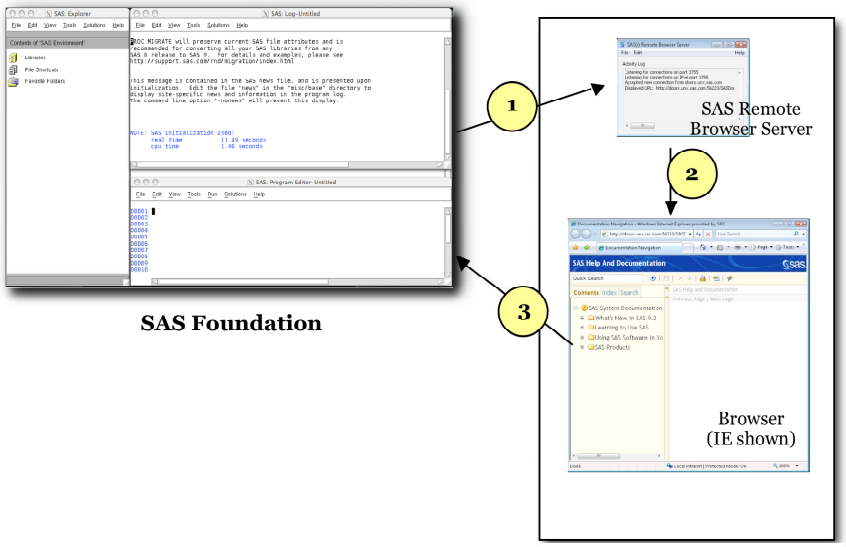
Both SAS 9.4 Foundation software and client applications support recent versions of popular web browsers to display SAS user interfaces. To run SAS clients, use a browser and platform combination that is listed on the SAS Support for Web Browsers page.

Most SAS product user interfaces deploy HMTL5 to support newer features. For example, SAS Visual Analytics uses HTML5. These products require recent browser versions.

Remote Browsing

SAS 9.4 Foundation uses Remote Browsing to display web-based information. Instead of running a browser on the workstation server, SAS 9.4 Foundation sends the URL to your desktop computer for display in a web browser. This feature removes the browser overhead from the server and allows for the display of output that requires browser plug-ins that do not run on a 64-bit computer. A software agent, the Remote Browser Server, is installed on your desktop computer to enable SAS to communicate with your browser.

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



With SAS 9.4M8, remote browsing runs on Windows 10, Windows 11, and 64-bit Linux. To support the remote browsing feature, your desktop computer must have a recent version of one of the following browsers installed:

- Google Chrome
- Microsoft Edge for Chromium
- Mozilla Firefox

The SAS Remote Browser Server, SAS Foundation, and client applications support 32-bit or 64-bit browser software. However, 64-bit browsers are recommended.

A supported operating system and browser and the Remote Browser Server must be installed and running on your desktop machine to enable Remote Browsing. The installer for the Remote Browser Server can be found on the SAS 9.4 Software Downloads site (`https://support.sas.com/downloads/`). The browser must also be configured to allow pop-up windows. In addition, make sure that the default browser on the local machine is set to the browser that you want to use, and then select **Default Browser** for the **Display with browser** setting in the Remote Browser Preferences dialog box.

Hardware Requirements

Machines Supported

The following machines are supported:

- All models that support Solaris 11 for x64
- Intel processors with Intel 64 support
- AMD processors with AMD64 support

Distribution Media

The following distribution methods are supported:

- Electronic Software Delivery
- DVD

System Configuration

The following are minimum resource levels for a deployment of SAS 9.4 Foundation on Solaris for x64. These are the minimum requirements for SAS software to function. However, more memory and additional resources are typically needed to meet your organization's requirements:

Desktop Systems

- A minimum of two cores
- 2 GB RAM (available to SAS)
- Swap space: 32 GB (minimum).

  If the host machine has more than 12 CPU cores and heavy memory usage, consider allocating 64 GB or more of swap space. If your system administrator detects that swap is regularly using more swap space than this resource level provides, increase the swap space to match the workload requirements. If you observe that swap space levels are exceeded regularly, SAS recommends adding RAM in order to avoid swapping, which is detrimental to performance.

Server Systems

- A minimum of 4 cores
- 16 GB RAM (available to SAS)
- Swap space: 32 GB (minimum).
  If the host machine has more than 12 CPU cores and heavy memory usage, consider allocating 64 GB or more of swap space. If your system administrator detects that swap is regularly using more swap space than this resource level provides, increase the swap space to match the workload requirements. If you observe that swap space levels are exceeded regularly, SAS recommends adding RAM in order to avoid swapping, which is detrimental to performance.
- I/O Throughput of at least 400 MB/second/core for each file system that is used by SAS (such as the file system for persistent and temporary SAS data files).

Note: *SAS encourages you to obtain a hardware recommendation that is based on your estimated workload and number of users.*

Displays Supported

SAS 9.4 supports any X display server in conjunction with an ICCCM-compliant window manager.

Space Requirements

SAS 9.4 Foundation requires approximately 30 MB of disk space on the `/tmp` partition to complete the installation.

SAS recommends consulting with a SAS Sizing Expert for an official hardware sizing that is based on your estimated SAS workload and number of users. Disk space requirements are provided for individual components in separate documents. However, the space requirements that you can obtain from the individual System Requirements documents that are provided for SAS Solutions and other add-on products are not a substitution for expert advice.

To request sizing expertise, send an email to `contactcenter@sas.com`.

Specific Product Requirements

Base SAS Software

Requirements for SPD Engine on Solaris

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

SAS Micro Analytic Service

If you use SAS Micro Analytic Service as an execution engine, be aware that with SAS 9.4M8, SAS Micro Analytic Service does not support Solaris.

Support for Data Storage in Amazon S3

If you are integrating SAS®9 and SAS Viya, you can access data that is stored in Amazon Simple Storage Service (S3). You can use the `CASLIB` statement to connect the CAS server with an S3 instance. The `FILENAME` statement lets you connect with your S3 data source.

For the S3 procedure, `FILENAME S3`, a CAS S3 data source, and the CAS S3 action set, only AWS is supported. The `FILENAME S3` statement uses only the AWS S3 REST APIs. EC2 Instance Metadata Service 1 and 2 are supported. You can use the `FILENAME S3` or `PROC S3` statement to connect with your S3 or MinIO data source.

SAS provides S3 support only for Amazon S3. Third-party compatible providers that implement the public Amazon S3 API might work, but SAS has not validated these providers. As a result, SAS cannot provide direct technical support for other S3-compatible providers.

Before you can use the S3 procedure, an AWS key ID and secret are required. A security token is also required if you are using temporary credentials. For more information, see the Amazon S3 documentation.

SAS Grid Products

The term "SAS Grid" encompasses the following products:

- SAS Grid Manager
- SAS Grid Manager for Hadoop
- SAS Grid Manager for Platform
- Platform Suite for SAS, which includes components from IBM and components from SAS.

These products have unique system requirements and installation documentation, which can be found on the following web pages:

Platform Suite for SAS:

- Requirements and Administration: Platform Suite for SAS documentation
- Installation: Installing and Configuring a SAS Grid Environment

SAS Grid Manager products: SAS Grid Manager documentation

SAS Analytics Accelerator for Teradata

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

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

SAS has extended SAS/ACCESS and SAS In-Database Technologies support to selected cloud and database variants of supported data sources. For a list of the supported variants, see https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-database.html.

DBMS Products Required:

- Teradata Database version 13.10 or later
- Teradata CLIv2 client libraries, TTU 13.10 - 16.20 for Solaris for x64 (64-bit libraries)

For SAS 9.4M3

DBMS Products Required:

- Teradata Database version 14.10 or later
- Teradata CLIv2 client libraries, TTU 14.10 - 16.20 (64-bit libraries)

For SAS 9.4M4 and 9.4M5

DBMS Products Required:

- Teradata Database version 15.10 or later
- Teradata CLIv2 client libraries, TTU 15.10 - 16.20 (64-bit libraries)

For SAS 9.4M6 - 9.4M7

DBMS Products Required:

- Teradata Database version 16.10 or later
- Teradata CLIv2 client libraries, TTU 16.10 - 16.20 (64-bit libraries)

For SAS 9.4M8

DBMS Products Required:

- Teradata Database version 17.10 or later
- Teradata CLIv2 client libraries, TTU 17.10 or later (64-bit libraries)

SAS In-Database Code Accelerator for Greenplum

The SAS In-Database Code Accelerator for Greenplum requires Base SAS and SAS/ACCESS Interface to Greenplum. It also requires the SAS Embedded Process to be installed and configured on your database.

DBMS Operating Systems:

- Red Hat Enterprise Linux 64-bit, version 6.7 or later
- SUSE Linux Enterprise Server 64-bit, version 11 or later with the latest Service Pack

***Note**: With SAS 9.4M8 and later, SUSE Linux Enterprise Server 11 is not supported. Use SUSE 12 or SUSE 15 instead.*

DBMS Products Required:

- Greenplum Database version 4.2.2 or later
- Greenplum Partner Connector (GPPC) version 1.2 or later

For SAS 9.4M2 - 9.4M5

DBMS Products Required:

- Greenplum Database version 4.3 or later
- Greenplum Partner Connector (GPPC) version 1.2 or later

In Greenplum 5.x, the Partner Connector library (GPPC) is integrated natively into the database. If you are using a Greenplum 5.0 or later database, it is not necessary to install the package. For best performance, SAS recommends using Greenplum 5.7 or later.

For SAS 9.4M6 – 9.4M8

DBMS Product Required: Greenplum Database version 5.7 or later

For best results, SAS recommends having the latest Service Packs on the client and server.

SAS In-Database Code Accelerator for Hadoop

The SAS In-Database Code Accelerator for Hadoop requires Base SAS and SAS/ACCESS Interface to Hadoop. It also requires the SAS Embedded Process to be installed and configured on Hadoop.

For SAS 9.4M4 – 9.4M6

Hive 0.14 or later is required.

For SAS 9.4M7 – 9.4M8

Hive 1.1 or later is required.

For supported Hadoop distributions and versions, refer to the following web page:

https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-hadoop.html.

SAS has extended SAS/ACCESS and SAS In-Database Technologies support to selected cloud and database variants of supported data sources. For more information about the supported variants, see https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-database.html.

SAS In-Database Code Accelerator for Teradata

The SAS In-Database Code Accelerator for Teradata requires Base SAS and SAS/ACCESS Interface to Teradata. It also requires the SAS Embedded Process to be installed and configured on your database.

Contact a Teradata representative to obtain the required support functions for the SAS Embedded Process. It is important to install the latest version from Teradata at Your Service. Teradata Customer Service coordinates installation of the SAS Embedded Process packages and application of the SAS Embedded Process support functions (sasepfunc) on the DBMS machine.

***Note**: The version number for sasepfunc indicates the highest version of Teradata Database that is supported. It is backward-compatible with Teradata Database 15.xx and earlier versions of Teradata Database 16.xx.*

SAS has extended SAS/ACCESS and SAS In-Database Technologies support to selected cloud and database variants of supported data sources. For a list of the supported variants, see https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-database.html.

DBMS Products Required:

- Teradata Database version 13.10 or later
- Teradata CLIv2 client libraries, TTU 13.10 - 16.20 for Solaris for x64 (64-bit libraries)

For SAS 9.4M3

DBMS Products Required:

- Teradata Database version 14.10 or later
- Teradata CLIv2 client libraries, TTU 14.10 - 16.20 (64-bit libraries)
- SAS Embedded Process support functions (sasepfunc-14.10-4 or later)

For SAS 9.4M4 – 9.4M5

DBMS Products Required:

- Teradata Database version 15.10 or later
- Teradata CLIv2 client libraries, TTU 15.10 - 16.20 (64-bit libraries)
- SAS Embedded Process support functions (sasepfunc-15.10-4 or later)

For SAS 9.4M6 – 9.4M7

DBMS Products Required:

- Teradata Database version 16.10 or later
- Teradata CLIv2 client libraries, TTU 16.10 - 16.20 (64-bit libraries)
- SAS Embedded Process support functions (sasepfunc-16.20-2 or later)

For SAS 9.4M8

DBMS Products Required:

- Teradata Database version 17.10 or later
- Teradata CLIv2 client libraries, TTU 17.10 or later (64-bit libraries)
- SAS Embedded Process support functions, latest version available

SAS Scoring Accelerator for DB2

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

A current version of the IBM XLC compiler must be installed on the Db2 server where you will be publishing scores. Contact your IBM/Db2 representative to obtain the appropriate compiler for your Db2 installation.

DBMS Operating Systems:

- AIX 64-bit, version 7.1 with Service Pack 3 or later
- Red Hat Enterprise Linux 64-bit, version 7.9 or later

DBMS Products Required:

- IBM Db2 version 10.1 with FixPack 1 or later
- Client utilities for IBM Db2 version 10.1 or later

For SAS 9.4M1 – 9.4M8

DBMS Products Required:

- IBM Db2 version 10.5 or later
- Client utilities for IBM Db2 version 10.5 or later

For best results, SAS recommends installing the latest FixPack on the client and server.

SAS Scoring Accelerator for Greenplum

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

DBMS Operating Systems:

- Red Hat Enterprise Linux 64-bit, version 6.7 or later
- SUSE Linux Enterprise Server 64-bit, version 11 or later with the latest Service Pack

DBMS Product Required:

- Greenplum Database version 4.2.2.0 or later
- Greenplum Partner Connector (GPPC) version 1.2 or later

For SAS 9.4M2 – 9.4M5

DBMS Products Required:

- Greenplum Database version 4.3 or later
- Greenplum Partner Connector version 1.2 or later

In Greenplum 5.x, the Partner Connector library (GPPC) is integrated natively into the database. If you are using a Greenplum 5.0 or later database, it is not necessary to install the package. For best performance, SAS recommends using Greenplum 5.7 or later.

For SAS 9.4M6 – 9.4M8

DBMS Product Required: Greenplum Database version 5.7 or later.

For best results, SAS recommends installing the latest Service Packs on the client and server.

SAS Scoring Accelerator for Hadoop

SAS Scoring Accelerator for Hadoop requires Base SAS, SAS/ACCESS Interface to Hadoop, and SAS/STAT. It also requires SAS Enterprise Miner or SAS Model Manager.

For SAS 9.4M4 – 9.4M6

Hive 0.14 or later is required.

For SAS 9.4M7 – 9.4M8

Hive 1.1 or later is required.

For supported Hadoop distributions and versions, refer to the following web page: https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-hadoop.html.

SAS has extended SAS/ACCESS and SAS In-Database Technologies support to selected cloud and database variants of supported data sources. For more information about the supported variants, see https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-database.html.

SAS Scoring Accelerator for Oracle

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

SAS has extended SAS/ACCESS and SAS In-Database Technologies support to selected cloud and database variants of supported data sources. For a list of the supported variants, see https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-database.html.

DBMS Operating Systems:

- Red Hat Enterprise Linux version 6.7 or later
- Oracle Enterprise Linux version 5.5 or later

DBMS Products Required:

- Oracle Server version 11gR2 or later. The database encoding must be UTF8.
- Oracle Client release 11gR2 (64-bit libraries) or later

Notes: *Some additional configuration might be required to use the 12c, 18c, or later client. See the Configuration Guide for SAS 9.4 Foundation for UNIX Environments for more information.*

You can also use the Oracle Instant Client with SAS/ACCESS Interface to Oracle. However, if you find any issues, you should switch to the full Oracle client, which is the only Oracle client that SAS uses in official tests. SAS Technical Support will only investigate issues that can be reproduced with the full Oracle client.

For best results, SAS recommends installing the latest patches on the client and server.

SAS Scoring Accelerator for SAP HANA

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

DBMS Operating Systems:

For SAS 9.4M2 – 9.4M3

- Red Hat Enterprise Linux 64-bit, version 6.6 or later
- SUSE Linux Enterprise Server 64-bit, version 11 or later with the latest service pack

For SAS 9.4M4 – 9.4M5

- Red Hat Enterprise Linux 64-bit, version 6.10 or later
- SUSE Linux Enterprise Server 64-bit, version 12 or later with the latest service pack

For SAS 9.4M6 – 9.4M8

- Red Hat Enterprise Linux 64-bit, version 7.2 or later
- SUSE Linux Enterprise Server 64-bit, version 12 or later with the latest service pack

***Note**: Refer to SAP Note 2235581 "SAP HANA: Supported Operating Systems" for more information regarding operating system versions that are supported for a specific SAP HANA release and revision level. This note is available at* `https://launchpad.support.sap.com/#/notes/2235581`.

DBMS Products Required:

For SAS 9.4M2 – 9.4M3

- SAP HANA 1.0 SPS 08 Server or later
- Client utilities for SAP HANA 1.0 SPS 08 or later

For SAS 9.4M4 – 9.4M5

- SAP HANA 1.0 SPS 12 Server or later
- Client utilities for SAP HANA 1.0 SPS 12 or later

For SAS 9.4M6 – 9.4M8

- SAP HANA 2.0 SPS 02 or SAP HANA 2.0 SPS 03 Server
- Client utilities for SAP HANA 2.0 SPS 02 or later

***Note**: In order to run SAS Scoring Accelerator for SAP HANA for SAS 9.4M6 on an SAP HANA 2.0 SPS04 server or later, you must access and apply the software updates for SAS Embedded Process. To access and apply these software updates, request a SAS 9.4M6 instance of SAS Embedded Process from your SAS account representative. If you need assistance in determining your SAS account representative, send an email to contactcenter@sas.com.*

For best results, match the SAP HANA client version with the version of the SAP HANA server where it will be connected.

SAS also recommends installing the latest Service Packs on the client and server.

SAS Scoring Accelerator for SPD Server

The SAS Scoring Accelerator for SPD Server requires Base SAS, SAS Enterprise Miner, SAS Scalable Performance Data Server version 5.1, and SAS/STAT.

For SAS 9.4M3

DBMS Product Required: SAS Scalable Performance Data Server version 5.2

For SAS 9.4M4

DBMS Product Required: SAS Scalable Performance Data Server version 5.3

For SAS 9.4M5 – 9.4M8

DBMS Product Required: SAS Scalable Performance Data Server version 5.4

SAS Scoring Accelerator for Teradata

The SAS Scoring Accelerator for Teradata requires Base SAS, SAS/ACCESS Interface to Teradata, and SAS/STAT. It also requires SAS Embedded Process support functions.

You must also license either SAS Enterprise Miner or SAS Model Manager, (or both), depending on the type of models that are exported. SAS Model Manager is required for STAT Linear models. SAS Enterprise Miner is required for Enterprise Miner models.

Contact a Teradata representative to obtain the required support functions for the SAS Embedded Process. It is important to install the latest version from Teradata at Your Service. Teradata Customer Service coordinates installation of the SAS Embedded Process packages and application of the SAS Embedded Process support functions (sasepfunc) on the DBMS machine.

***Note**: The version number for sasepfunc indicates the latest version of Teradata Database that is supported. It is backward-compatible with Teradata Database 15.xx and earlier versions of Teradata Database 16.xx.*

SAS has extended SAS/ACCESS and SAS In-Database Technologies support to selected cloud and database variants of supported data sources. For a list of the supported variants, see `https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-database.html`.

DBMS Products Required:

- Teradata Database version 13.10 or later
- Teradata CLIv2 client libraries, TTU 13.10 - 16.20 for Solaris for x64 (64-bit libraries)

For SAS 9.4M3

DBMS Products Required:

- Teradata Database version 14.10 or later
- Teradata CLIv2 client libraries, version TTU 14.10 - 16.20 (64-bit libraries)
- SAS Embedded Process support functions (sasepfunc-14.10-4 or later)

For SAS 9.4M4 and 9.4M5

DBMS Products Required:

- Teradata Database version 15.10 or later
- Teradata CLIv2 client libraries, TTU 15.10 - 16.20 (64-bit libraries)
- SAS Embedded Process support functions (sasepfunc-15.10-4 or later)

For SAS 9.4M6 - 9.4M7

DBMS Products Required:

- Teradata Database version 16.10 or later
- Teradata CLIv2 client libraries, TTU 16.10 - 16.20 (64-bit libraries)
- SAS Embedded Process support functions (sasepfunc-16.10-4 or later)

For SAS 9.4M8

DBMS Products Required:

- Teradata Database version 17.10 or later
- Teradata CLIv2 client libraries, TTU 17.10 or later (64-bit libraries)
- SAS Embedded Process support functions, latest version available

SAS/ACCESS Interface to Amazon Redshift

Base SAS is required for the installation of SAS/ACCESS Interface to Amazon Redshift.

SAS/ACCESS Interface to Amazon Redshift includes a required ODBC driver.

For instructions about how to configure SAS/ACCESS Interface to Amazon Redshift, see the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*.

SAS/ACCESS Interface to DB2

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

SAS/ACCESS Interface to DB2 can be installed on a Db2 server or on a Db2 client node with an installation of the IBM Data Server Client. In addition, Db2 Connect must be licensed to connect to Db2 databases that reside on AS/400, VSE, VM, MVS, and z/OS systems.

DBMS Products Required:

- IBM DB2 version 10.1 or later
- Client utilities for IBM Db2 version 10.1 or later

For SAS 9.4M1 and Later

DBMS Products Required:

- IBM Db2 10.5 or later
- Client utilities for IBM Db2 10.5 or later

For best results, SAS recommends installing the latest FixPack on the client and server.

SAS/ACCESS Interface to Greenplum

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

SAS/ACCESS Interface to Greenplum includes the required 64-bit ODBC driver.

For instructions about how to configure SAS/ACCESS Interface to Greenplum, see the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*.

DBMS Product Required: Greenplum Database version 4.3 or later.

SAS does not recommend using Greenplum Database versions 5.0 - 5.6.

For SAS 9.4M6

DBMS Product Required: Greenplum Database version 5.7 or later.

For SAS 9.4M7 – 9.4M8

DBMS Product Required: Greenplum Database version 6.0 or later

SAS/ACCESS Interface to Hadoop

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

For SAS 9.4M4 – 9.4M6

Hive 0.14 or later is required.

For SAS 9.4M7 – 9.4M8

Hive 1.1 or later is required.

For supported Hadoop distributions and versions, refer to the following web page:
https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-hadoop.html.

SAS has extended SAS/ACCESS and SAS In-Database Technologies support to selected cloud and database variants of supported data sources. For a list of the supported variants, see https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-database.html.

SAS/ACCESS Interface to HAWQ

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

SAS/ACCESS Interface to HAWQ includes the required 64-bit ODBC driver.

For SAS 9.4M3

DBMS Product Required: HAWQ Database version 1.2.1 or later

For SAS 9.4M4

DBMS Product Required: HAWQ Database version 2.0 or later

For SAS 9.4M5 – 9.4M7

DBMS Product Required: HAWQ Database version 2.2 or later

Important: *With SAS 9.4M8, SAS/ACCESS Interface to HAWQ is not available. If you upgrade or migrate SAS Foundation to SAS 9.4M8, SAS recommends that you install and use SAS/ACCESS Interface to Greenplum instead. Consult the system requirements for SAS/ACCESS Interface to Greenplum or contact your SAS representative for assistance.*

If you have an existing installation of SAS/ACCESS Interface to HAWQ in your environment, SAS recommends that you first unconfigure and uninstall before upgrading or migrating to SAS 9.4M8. A best practice is to unconfigure retired SAS products before you upgrade and to uninstall them after

you upgrade. For more information, see "Unconfiguring and Uninstalling Retired Products" in the SAS Guide to Software Updates and Product Changes.

For instructions about how to configure SAS/ACCESS Interface to HAWQ, see the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*.

SAS/ACCESS Interface to JDBC

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

SAS/ACCESS Interface to JDBC requires a Java Database Connectivity (JDBC) driver. JDBC drivers are often available from DBMS vendors and from other third-party JDBC driver developers. SAS recommends using JDBC drivers that comply with the JDBC 4.1 specification or later.

SAS/ACCESS Interface to Microsoft SQL Server

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

SAS/ACCESS Interface to Microsoft SQL Server includes the required ODBC driver.

SAS has extended SAS/ACCESS and SAS In-Database Technologies support to selected cloud and database variants of supported data sources. For a list of the supported variants, see `https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-database.html`.

DBMS Product Required: Microsoft SQL Server 2008 or later.

For SAS 9.4M3 – 9.4M8

DBMS Product Required: Microsoft SQL Server 2012 or later.

For directions about how to configure SAS/ACCESS Interface to Microsoft SQL Server, see the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*.

SAS/ACCESS Interface to MySQL

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

SAS has extended SAS/ACCESS and SAS In-Database Technologies support to selected cloud and database variants of supported data sources. For a list of the supported variants, see `https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-database.html`.

DBMS Products Required:

- MySQL Client version 5.1, 5.6, or 5.7
- MySQL Server version 5.1 or later

For SAS 9.4M4 – 9.4M6

DBMS Products Required:

- MySQL Client version 5.6 or 5.7
- MySQL Server version 5.6 or later

For SAS 9.4M7 – 9.4M8

DBMS Products Required:

- MySQL Client version 5.7 or 8.0
- MySQL Server version 5.7 or later (including MySQL 8)

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

SAS/ACCESS Interface to ODBC

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

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

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

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

The ODBC drivers are ODBC API-compliant dynamic link libraries, referred to in UNIX as shared objects. You must include the full path to the dynamic link libraries in the OS load library environment variable, i.e. `LD_LIBRARY_PATH`, `LIBPATH`, or `SHLIB_PATH`, so that the ODBC drivers can be loaded dynamically at run time. For more information, consult your ODBC driver vendor.

SAS/ACCESS Interface to Oracle

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

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

To use the Bulk Load feature of this SAS product, the Oracle SQL*Loader data-loading utility must be installed. This utility can be obtained by running the Oracle installer and selecting the Oracle Utilities product. Refer to your Oracle documentation for information on SQL*Loader.

SAS has extended SAS/ACCESS and SAS In-Database Technologies support to selected cloud and database variants of supported data sources. For a list of the supported variants, see https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-database.html.

DBMS Products Required:

- Oracle Database 11gR2 or later
- Oracle Client 11gR2 (64-bit libraries) or later

For SAS 9.4M7 – 9.4M8

DBMS Products Required:

- Oracle Database 12.1 or later
- Oracle Client 12.1 or later

Notes: *Some additional configuration might be required to use the 12c, 18c, or later client. See the Configuration Guide for SAS 9.4 Foundation for UNIX Environments for more information.*

You can also use the Oracle Instant Client with SAS/ACCESS Interface to Oracle. However, if you find any issues, you should switch to the full Oracle client, which is the only Oracle client that SAS uses in official tests. SAS Technical Support will only investigate issues that can be reproduced with the full Oracle client.

For best results, SAS recommends installing the latest patches on the client and server.

SAS/ACCESS Interface to PC Files

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

Product Required on Windows: 32-bit or 64-bit SAS PC Files Server, running the same "bitness" of ACE (Microsoft Access Database Engine 2010 Redistributable) driver on the same Windows machine.

DBMS Product Required on Windows: Microsoft Access Database Engine 2010 Redistributable (ACE) or a later version.

SAS/ACCESS Interface to PC Files supports access to virtually any data source through ODBC support on Windows, as well as the following software formats:

- dBase files (`.dbf`)
- Excel files (`.xls`, `.xlsx`, `.xlsb`, `.xlsm`)
- JMP files (`.jmp` is in Base)
- Lotus files (`.wk1`, `.wk3`, and `.wk4`)
- Microsoft Access database files (`.mdb` or `.accdb`)
- Paradox (`.db`)
- SPSS files (`.sav`)
- Stata files (`.dta`)

SAS PC Files Server (`pcfserver.exe` or `pcfservice.exe`) running on Windows is required to use the PCFILES libname engine to access Microsoft Access database files, Microsoft Excel workbook files, or any ODBC-supported data sources.

You can run SAS PC Files Server as a Windows service or as an application listening to the PCFILES libname engine. SAS PC Files Server provides data encryption and authentication features with default port 9621, which can be configured through the SAS PC Files Server application console. Note that the "bitness" (32-bit or 64-bit) of SAS PC Files Server must match that of the Microsoft ACE driver on the same Windows machine.

SAS/ACCESS Interface to the PI System

Base SAS is required for the installation of SAS/ACCESS Interface to the PI System.

SAS/ACCESS Interface to the PI System uses the PI System Web API, which is HTTPS-based and RESTful. No PI System client software is required to be installed on the machine where SAS is running. However, the PI System Web API (PI Web API 2015-R2 or later) must be installed and activated on the host machine where the user connects.

For information about how to configure the PI System on the server, refer to the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*.

SAS/ACCESS Interface to PostgreSQL

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

SAS/ACCESS Interface to PostgreSQL includes the required 64-bit ODBC driver.

SAS has extended SAS/ACCESS and SAS In-Database Technologies support to selected cloud and database variants of supported data sources. For a list of the supported variants, see https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-database.html.

DBMS Product Required: PostgreSQL Database version 9.1.9 or later.

For SAS 9.4M4 and 9.4M5

DBMS Product Required: PostgreSQL Database version 9.1.23 or later.

For SAS 9.4M6 – 9.4M8

DBMS Product Required: PostgreSQL Database version 9.5.14 or later.

SAS/ACCESS Interface to SAP ASE

Base SAS is required for the installation of SAS/ACCESS Interface to SAP ASE (formerly SAS/ACCESS Interface to Sybase).

Note: *Connecting to SAP IQ is not supported by SAS/ACCESS Interface to SAP ASE; use SAS/ACCESS Interface to SAP IQ instead.*

DBMS Product Required: SAP ASE (Sybase) Open Client SDK, Release 15.7 or later (64-bit libraries)

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

SAS/ACCESS Interface to SAP HANA

Base SAS is required for the installation of SAS/ACCESS Interface to SAP HANA.

SAS/ACCESS Interface to SAP HANA requires the ODBC driver (64-bit) for SAP HANA from SAP. The ODBC driver is part of the SAP HANA Client.

DBMS Products Required:

- SAP HANA 1.0 SPS 08 Server or later
- SAP HANA ODBC Client for SAP HANA 1.0 SPS 08 or later

For SAS 9.4M4 – 9.4M6

DBMS Products Required:

- SAP HANA 1.0 SPS 12 Server or later
- SAP HANA ODBC Client for SAP HANA 1.0 SPS 12 or later

For SAS 9.4M7 – 9.4M8

DBMS Products Required:

- SAP HANA 2.0 SPS 4 Server or later
- SAP HANA ODBC Client for SAP HANA 2.2.83 or later

For best results, SAS recommends installing the latest Service Packs on the client and server. SAS also recommends matching the SAP HANA client version with the version of the SAP HANA server where it will be connected.

SAS/ACCESS Interface to SAP IQ

Base SAS is required for the installation of SAS/ACCESS Interface to SAP IQ (formerly SAS/ACCESS Interface to Sybase IQ).

To obtain the required SAP IQ Network Client, contact your database administrator or SAP Technical Support.

DBMS Products Required:

- SAP IQ Network Client version 15.4
- SAP IQ Database version 15.4 or later

For SAS 9.4M3 – 9.4M5

DBMS Products Required:

- SAP IQ Network Client version 16.0
- SAP IQ Database version 16.0

For SAS 9.4M6 - 9.4M7

DBMS Products Required:

- SAP IQ Network Client version 16.0 or 16.1*
- SAP IQ Database version 16.0 or 16.1

For SAS 9.4M8

DBMS Products Required:

- SAP IQ Network Client version 16.1
- SAP IQ Database version 16.0 or 16.1

* Prior to SAS 9.4M8, a hot fix for SAS/ACCESS Interface to SAP IQ is required in order to use version 16.1 of the client. Once you have applied the hot fix or upgraded to SAS 9.4M8, only the version 16.1 client is supported. See the following SAS note for instructions: 67439.

SAS/ACCESS Interface to Teradata

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

SAS has extended SAS/ACCESS and SAS In-Database Technologies support to selected cloud and database variants of supported data sources. For a list of the supported variants, see https://support.sas.com/en/documentation/third-party-software-reference/9-4/support-for-database.html.

TLS 1.2 is supported when using SAS/ACCESS Interface to Teradata. The Teradata database must use version 16.20.53.30 or later and TTU version 17.10 or later. When you have configured the database for TLS, you can encrypt data that is transferred between Teradata and SAS 9.4M8 or later. For more information, see Configure TLS for SAS/ACCESS Connection to Teradata.

DBMS Products Required:

- Teradata Database version 13.10 or later
- Teradata CLIv2 client libraries, TTU 13.10 - 16.20 for Solaris for x64 (64-bit libraries)

For SAS 9.4M3

DBMS Products Required:

- Teradata Database version 14.10 or later
- Teradata CLIv2 client libraries, TTU 14.10 - 16.20 (64-bit libraries)

For SAS 9.4M4 – 9.4M6

DBMS Products Required:

- Teradata Database version 15.10 or later
- Teradata CLIv2 client libraries, TTU 15.10 - 16.20 (64-bit libraries)

For SAS 9.4M7

DBMS Products Required:

- Teradata Database version 16.10 or later
- Teradata CLIv2 client libraries, TTU 17.10 if using TPT and not using Legacy Utilities
- Teradata Database version 16.*xx* if using TTU 16.10 or TTU 16.20
- Teradata Database version 17.*xx* if using TTU 17.10

For SAS 9.4M8

DBMS Products Required:

- Teradata CLIv2 client libraries, TTU 17.10 or later
- Teradata Database version 17.*xx*

SAS/AF

Products Required for Build Mode

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

Other products might be required, depending on the application.

Products Required for Run Mode

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

Other products may be required, depending on the application.

Printers

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

SAS/EIS

Products Required for Build Mode

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

Other products may be required, depending on the application.

Products Required for Run Mode

- Base SAS
- SAS/EIS
- SAS/GRAPH

Other products may be required, depending on the application.

Memory

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

Printers

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

SAS/Genetics

Important: *With SAS 9.4M8, SAS/Genetics is not available. In order to continue using SAS/Genetics, do not upgrade Base SAS or SAS Foundation to SAS 9.4M8.*

A best practice is to unconfigure retired SAS products before you upgrade and to uninstall them after you upgrade. For more information, see "Unconfiguring and Uninstalling Retired Products" in the SAS Guide to Software Updates and Product Changes.

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

SAS/GIS

Products Required for Build Mode

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

Other products may be required, depending on the application.

Products Required for Run Mode

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

Other products may be required, depending on the application.

Printers

A color or gray-scale printer is required.

SAS/IntrNet

SAS/IntrNet 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 9.4 media.

CGI Tools and Applications

Application Dispatcher

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

htmSQL

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

MDDB Report Viewer Application

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

Xplore Sample Web Application

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

Java Tools and Applications

SAS/CONNECT Driver for Java

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

The use of graphics in SAS/OR software requires a SAS/GRAPH license.

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