System Requirements for SAS® 9.4 Foundation for Linux for x64

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Overview

This document provides requirements for installing and running SAS 9.4 Foundation for Linux for x64. It has been updated for SAS 9.4M9 (TS1M9).

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

- 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 SAS Support for Alternative Operating Systems.

Troubleshooting System Performance Problems

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

Maintenance Releases and Third-Party Support

***Note**: SAS 9.4M7 entered Limited Support from SAS in September 2025. 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 SAS Software Support When Third-Party Vendors Drop Support.

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

Software Requirements

SAS Foundation is supported on the following Linux operating systems:

- Oracle Enterprise Linux (64-bit version) on the x64 chip family
- Red Hat Enterprise Linux (64-bit version) on the x64 chip family
- SUSE Linux Enterprise Server (64-bit version) on the x64 chip family

Operating Systems for SAS 9.4M7 – SAS 9.4M9

Operating Systems for SAS 9.4 Maintenance Releases

SAS 9.4 Maintenance Release	Linux Operating System Support
SAS 9.4M9	Oracle Enterprise Linux 8.10 Oracle Enterprise Linux 9.1 and later within 9.*x* Oracle Enterprise Linux 10.0 and later within 10.*x* Red Hat Enterprise Linux 8.10 Red Hat Enterprise Linux 9.1 and later within 9.*x* Red Hat Enterprise Linux 10.0 and later within 10.*x* SUSE Linux Enterprise Server 15 with Service Pack 3 or a later service pack
SAS 9.4M8	Oracle Enterprise Linux 7.9 Oracle Enterprise Linux 8.4 and later within 8.*x* Oracle Enterprise Linux 9.1 and later within 9.*x* Oracle Enterprise Linux 10.0 and later within 10.*x** Red Hat Enterprise Linux 7.9 Red Hat Enterprise Linux 8.4 and later within 8.*x* Red Hat Enterprise Linux 9.1 and later within 9.*x* Red Hat Enterprise Linux 10.0 and later within 10.*x** SUSE Linux Enterprise Server 12 with Service Pack 5 or a later service pack SUSE Linux Enterprise Server 15 with Service Pack 3 or a later service pack
SAS 9.4M7	Oracle Enterprise Linux 6.*x* Oracle Enterprise Linux 7.1 and later within 7.*x* Oracle Enterprise Linux 8.4 and later within 8.*x* Oracle Enterprise Linux 9.1 and later within 9.*x* Oracle Enterprise Linux 10.0 and later within 10.*x** Red Hat Enterprise Linux 6.*x* Red Hat Enterprise Linux 7.1 and later within 7.*x* Red Hat Enterprise Linux 8.4 and later within 8.*x*

	Red Hat Enterprise Linux 9.1 and later within 9.*x* Red Hat Enterprise Linux 10.0 and later within 10.*x** SUSE Linux Enterprise Server 11** SUSE Linux Enterprise Server 12

* A command-line option is required for this combination. For more information, see Start SAS Deployment Wizard in the *SAS 9.4 Installation and Configuration Guide*.

** Starting with SAS 9.4M7, the SAS Web Server component cannot be deployed on SUSE Linux Enterprise Server 11. Install SAS Web Server on SUSE Linux Enterprise Server 12 or another supported operating system. You can also choose not to install SAS Web Server.

Operating Systems for SAS 9.4M0 – SAS 9.4M6

Operating Systems for Older SAS 9.4 Maintenance Releases

SAS 9.4 Maintenance Release	Linux Operating System Support
SAS 9.4M0 – SAS 9.4M4	Oracle Enterprise Linux 6.*x* Oracle Enterprise Linux 7.1 and later within 7.*x* Red Hat Enterprise Linux 6.*x* Red Hat Enterprise Linux 7.1 and later within 7.*x* SUSE Linux Enterprise Server 11
SAS 9.4M5	Oracle Enterprise Linux 6.*x* Oracle Enterprise Linux 7.1 and later within 7.*x* Red Hat Enterprise Linux 6.*x* Red Hat Enterprise Linux 7.1 and later within 7.*x* SUSE Linux Enterprise Server 11 SUSE Linux Enterprise Server 12
SAS 9.4M6	Oracle Enterprise Linux 6.*x* Oracle Enterprise Linux 7.1 and later within 7.*x* Oracle Enterprise Linux 8.4 and later within 8.*x* Red Hat Enterprise Linux 6.*x* Red Hat Enterprise Linux 7.1 and later within 7.*x* Red Hat Enterprise Linux 8.4 and later within 8.*x* SUSE Linux Enterprise Server 11 SUSE Linux Enterprise Server 12

Libraries and Packages

The typical Linux installation comes with all the packages that SAS requires. Problems can occur if default packages were removed from the base operating system (for example, X11 libraries and system utilities). SAS Foundation 9.4 also requires:

- the numactl package
- glibc2.12 or later. For more information, see glibc, below.
- libpng12. For more information, see libpng12, below.
- libpng15. For more information, see libpng15, below.
- X11/Xmotif (GUI) packages
- ncurses-compat-libs

  Note: *The ncurses compatibility library (specifically, libncurses.so.5) is not present on Red Hat Enterprise Linux or Oracle Linux 9.x. Red Hat recommends creating a symlink for for the missing libncurses.so.5 library to libncurses.so.6.*

- (For Red Hat Enterprise Linux or Oracle Linux) The libXp and libXmu packages

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 Linux 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.

A few SAS solutions require additional libraries to maintain functionality with Red Hat Enterprise Linux 8.x. For more information, see Security Requirements on page 6.

glibc

SAS 9.4 Foundation requires glibc 2.12 or later. Here are the minimum release levels for Red Hat Enterprise Linux or Oracle Linux:

- Red Hat Enterprise Linux 6 requires glibc-2.12-1.166.el6 and later. Refer to RHBA-2015:1465 to obtain the latest package list.
- Red Hat Enterprise Linux 7 requires glibc-2.17-107.el7 and later. Refer to RHSA-2016:2573 to obtain the latest package list.
- Red Hat Enterprise Linux 8 ships with a default release of glibc 2.34. No update is necessary.
- Red Hat Enterprise Linux 9 ships with a default release of glibc 2.28. No update is necessary.

Note: *To see all content related to the issue, users must log in to the Red Hat website.*

To determine which version of glibc is installed on the system where SAS will be installed, use the command `ldd --version`

libpng12

Starting with SAS 9.4M9, SAS 9.4 Foundation requires libpng12 when running on Red Hat Enterprise Linux 8.*x* or later, Oracle Linux 8.*x* or later, or SUSE Linux Enterprise Server 12 or later. A renderer that is used by selected procedures in SAS applications requires this package or it fails to start.

For Red Hat Enterprise Linux or Oracle Linux, you can use the following method to install libpng12:

```
sudo yum install libpng12
```

For SUSE Linux, you can use the following method to install libpng12:

```
zypper addrepo https://download.opensuse.org/repositories/home:ecsos/<version>
/home:ecsos.repo
zypper refresh
zypper install libpng12-12
```

Replace `<version>` with the latest version of the SUSE repositories that is currently available.

libpng15

In order to run in DMS mode, SAS 9.4 Foundation requires libpng15. More recent versions of Linux, such as Red Hat Enterprise Linux 8.*x* or Oracle Linux 8.*x* and SUSE Linux Enterprise Server 15, include libpng16 and require you to obtain and install the libpng15 RPM package.

For Red Hat Enterprise Linux or Oracle Enterprise Linux, you can use the following method to install libpng15:

```
sudo yum install libpng15
```

For SUSE Linux, you can use the following method to install libpng15:

```
zypper addrepo https://download.opensuse.org/repositories/home:ecsos/<version>
/home:ecsos.repo
zypper refresh
zypper install libpng15-15
```

Replace `<version>` with the latest version of the SUSE repositories that is currently available.

Libraries Required for Red Hat Enterprise Linux 8.*x*

For Red Hat Enterprise Linux 8.*x* with the OpenSSL 1.1.1 library, the libgit2 and libssh2 libraries are required to support the Git functionality in selected SAS solutions. By default, the required versions of these libraries are not included with the operating system. You can download these libraries from the SAS Support Downloads Index.

SELinux and Red Hat Federal Information Processing Standard (FIPS)

With SAS 9.4M7 and later, Security Enhanced Linux (SELinux) set to `Enforcing` is supported on Red Hat Enterprise Linux 8.*x* and 9.*x*.

With SAS 9.4M8 and later, SAS is supported on Linux when the operating system is running with FIPS mode enabled. However, the SAS system option `NETENCRALG=AES` is not supported on Red Hat Enterprise Linux 9.*x*. Instead, use `NETENCRALG=SSL` for TLS.

Note: *The NETENCRALG settings AES, DES, RC2, RC4, and TripleDES will be deprecated by SAS in a future release. SAS recommends using `NETENCRALG=SSL` to secure the SAS deployment using TLS.*

Operating System Tuning Guidelines

For information about tuning your Linux operating system for optimal performance of SAS 9.4, refer to SAS KB0036628, "Operating system tuning guidelines."

Java Requirements

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

Security Requirements

SAS strongly recommends that you use TLS as the encryption protocol for data in motion. Starting with SAS 9.4M8, SAS supports TLS 1.3. SAS also supports TLS 1.2.

Starting 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. When this issue is encountered, use a cipher suite that is supported by both SAS and that operating system, or install a third-party TLS provider for use by SAS. For more information, see *Encryption in SAS 9.4*.

If you are running SAS 9.4 Foundation on Red Hat Enterprise Linux 8.*x* with the OpenSSL 1.1.1 library, two libraries are not at the required level by default. For more information, see Libraries Required for Red Hat Enterprise Linux 8.*x* on page 5.

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

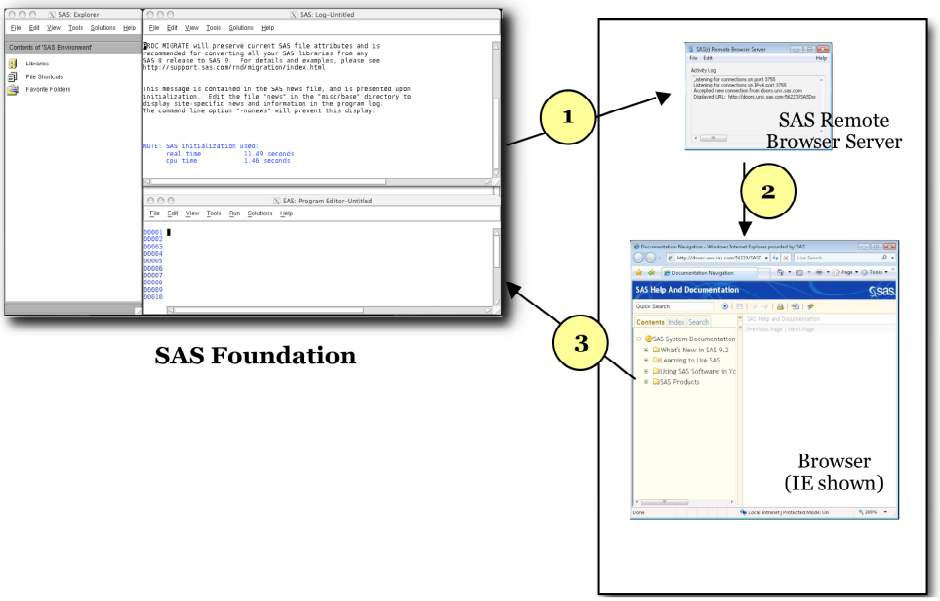
Both SAS 9.4 Foundation software and client applications support recent versions of popular web browsers to display SAS user interfaces. To run SAS clients, use a browser that is listed on the SAS 9.4 Support for Web Browsers page.

Most SAS product user interfaces include HMTL5 to support newer features. 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 and later, Remote Browsing runs on Windows 10 and 64-bit Linux. To use 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:

- Intel processors with Intel 64 support
- AMD processors with AMD64 support

System Configuration

Important: *Host name length is restricted to a maximum of 60 characters for all machines in the deployment.*

The following are minimum resource levels for a deployment of SAS 9.4 Foundation on Linux 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 2 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.

Server Systems

- A minimum of 4 cores for any server that hosts a SAS Workspace Server, or for any server where SAS jobs execute
- 8 GB of RAM per physical core (available to SAS)
- I/O throughput – SAS strongly recommends the following minimum I/O throughput levels for key SAS components:
  - SASWORK file system – 150 MB per second, per physical core on the host
  - SAS UTILLOC file system – 150 MB per second, per physical core on the host
  - Persistent upstream file systems that SAS reads (data sources) – 125 MB per second, per physical core on the host

  These rates support excellent performance, even for resource-intensive SAS jobs.
- 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.
- Network bandwidth: The minimum network bandwidth for any SAS host is 10 GB network host adapters (NICs) and 10 GB switches. For SAS Grid solutions or other distributed

deployments, SAS strongly recommends that you install SAS on hosts with 20 GB NICs and 20 GB switches.

Note: *SAS strongly 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

The binary files associated with SAS 9.4 Foundation require approximately 30 MB of disk space on the `/tmp` partition to complete the installation.

SAS strongly recommends consulting with a SAS Sizing Expert to obtain 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 Linux for x64

- 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

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:

SAS Grid Manager products: SAS Grid Manager documentation

Platform Suite for SAS:

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

SAS Data Quality Accelerator for Teradata

SAS Data Quality 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 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.*

Teradata has ended support for versions that precede Teradata 17.*xx*. For more information, see the Teradata Products Support Lifecycle and Compatibility Matrix.

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 SAS Support for Cloud and Database Variants.

DBMS Products Required:

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

For SAS 9.4M9

Starting with SAS 9.4M9, TPT API is the default and the only supported method that is used for all Teradata utility processing. For more information, see the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*.

DBMS Products Required:

- Teradata Database version 17.*xx*
- Teradata CLIv2 client libraries, TTU 17.20 or later (64-bit libraries)

SAS In-Database Code Accelerator for Greenplum

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
- SUSE Linux Enterprise Server 64-bit

Operating system support for each maintenance release of SAS 9.4 Foundation is described in Software Requirements on page 2.

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 SAS 9.4M9

DBMS Product Required: Greenplum Database version 6.5 or later

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

SAS In-Database Code Accelerator for Hadoop

Important: *Starting with SAS 9.4M9, the procedures for deploying SAS/ACCESS Interface to Hadoop and SAS In-Database products for Hadoop have changed. Several manual steps are required in order to configure the drivers and run a configuration script. Full details are available in the SAS 9.4 Hadoop Configuration Guide for Base SAS and SAS/ACCESS.*

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 information about SAS Embedded Process deployment, see *SAS 9.4 and SAS Viya 3.5 Embedded Process: Deployment Guide*.

For supported Hadoop distributions and versions, refer to the SAS Support for Hadoop web page.

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 SAS 9.4M9

The Cloudera Hive JDBC Driver 2.6.25 or later is required. For more information, see https://www.cloudera.com/downloads/connectors/hive/jdbc/2-6-25.html.

SAS In-Database Code Accelerator for Teradata

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 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.*

Teradata has ended support for versions that precede Teradata 17.*xx*. For more information, see the Teradata Products Support Lifecycle and Compatibility Matrix.

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 SAS Support for Cloud and Database Variants.

DBMS Products Required

- Teradata Database version 13.10 or later
- Teradata CLIv2 client libraries, TTU 13.10 - 16.20 for Linux (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)

For SAS 9.4M9

Starting with SAS 9.4M9, TPT API is the default and the only supported method that is used for all Teradata utility processing. For more information, see the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*.

DBMS Products Required:

- Teradata Database 17.*xx*
- Teradata CLIv2 client libraries, TTU 17.20 or later (64-bit libraries)

SAS Scoring Accelerator for Aster

Important: *Starting with SAS 9.4M8, SAS Scoring Accelerator for Aster is not available. If you upgrade or migrate SAS Foundation to SAS 9.4M8, SAS recommends that you install and use a different SAS/ACCESS engine and data source instead. Consult the system requirements for the selected SAS/ACCESS engine or contact your SAS representative for assistance.*

If you have an existing installation of SAS Scoring Accelerator for Aster 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.

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

The recommended DBMS operating system is Red Hat Enterprise Linux 64-bit, version 7.1 or later.

Operating system support for each maintenance release of SAS 9.4 Foundation is described in Software Requirements on page 2.

DBMS Products Required

- Aster Server versions 4.6.3, 5.0.1, 5.1, or 6.0
- Client utilities for Aster version 4.6.3, 5.0.1, or 5.1

For SAS 9.4M2 – 9.4M3

DBMS Products Required

- Aster Server version 6.0
- Client utilities for Aster version 5.1

For SAS 9.4M4 – 9.4M8

DBMS Products Required:

- Aster Server version 6.1
- Client utilities for Aster version 6.1 or later

SAS Scoring Accelerator for DB2

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

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

DBMS Operating Systems:

- IBM AIX 64-bit version 7.1 with Service Pack 3 or later
- Red Hat Enterprise Linux 64-bit, version 6.7 or later

Linux operating system support for each maintenance release of SAS 9.4 Foundation is described in Software Requirements on page 2.

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 SAS 9.4M9

DBMS Products Required:

- IBM Db2 version 11.5 or later
- Client utilities for IBM Db2 11.5 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
- SUSE Linux Enterprise Server 64-bit

Operating system support for each maintenance release of SAS 9.4 Foundation is described in Software Requirements on page 2.

DBMS Products Required:

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

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 SAS 9.4M9

DBMS Product Required: Greenplum Database version 6.5 or later

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

SAS Scoring Accelerator for Hadoop

Important: *Starting with SAS 9.4M9, the procedures for deploying SAS/ACCESS Interface to Hadoop and SAS In-Database products for Hadoop have changed. Several manual steps are required in order to configure the drivers and run a configuration script. Full details are available in the SAS 9.4 Hadoop Configuration Guide for Base SAS and SAS/ACCESS.*

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

SAS Scoring Accelerator also requires the SAS Embedded Process to be installed and configured on Hadoop. Full details are available in *SAS 9.4 and SAS Viya 3.5 Embedded Process: Deployment Guide*.

For supported Hadoop distributions and versions, refer to the SAS Support for Hadoop web page.

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 SAS 9.4M9

The Cloudera Hive JDBC Driver 2.6.25 or later is required. For more information, see `https://www.cloudera.com/downloads/connectors/hive/jdbc/2-6-25.html`.

SAS Scoring Accelerator for Netezza

SAS Scoring Accelerator for Netezza requires Base SAS, SAS Enterprise Miner, SAS/ACCESS Interface to Netezza, 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 more information about the supported variants, see SAS Support for Cloud and Database Variants.

DBMS Products Required:

- IBM Netezza version 7.0 or later
- Client utilities for IBM Netezza version 7.0 or later

For SAS 9.4M3 – 9.4M5

DBMS Products Required:

- IBM Netezza version 7.0.3 or later
- Client utilities for IBM Netezza version 7.0.3 or later

For SAS 9.4M6 and Later

DBMS Products Required:

- IBM Netezza version 7.2.1 or later
- Client utilities for IBM Netezza version 7.2.1 or later

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

SAS Scoring Accelerator for Oracle

SAS Scoring Accelerator for Oracle requires Base SAS, SAS/STAT, SAS/ACCESS Interface to Oracle, and 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 more information about the supported variants, see SAS Support for Cloud and Database Variants.

DBMS Operating Systems:

- Red Hat Enterprise Linux (64-bit)
- Oracle Enterprise Linux (64-bit)

Operating system support for each maintenance release of SAS 9.4 Foundation is described in Software Requirements on page 2.

DBMS Products Required:

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

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.

Due to an incompatibility, SAS versions prior to SAS 9.4M9 do not support Oracle Client 23ai. To use an Oracle 23ai client, upgrade to *SAS 9.4M9*.

For SAS 9.4M7 – 9.4M8

DBMS Products Required:

- Oracle Database 12.1 or later
- Oracle Client 12.1 or later, except for 23ai

If your version of the Oracle Database or Client is no longer supported by Oracle, SAS cannot assist you in troubleshooting any issues that you might encounter. Representatives from Oracle are not available to advise SAS on problems with these versions.

For SAS 9.4M9

DBMS Products Required:

- Oracle Database 19c or later
- Oracle Client 19c or 23ai

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:

- Red Hat Enterprise Linux 64-bit
- SUSE Linux Enterprise Server 64-bit

Operating system support for each maintenance release of SAS 9.4 Foundation is described in Software Requirements on page 2.

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 and Later

- 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

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 and Later

DBMS Product Required: SAS Scalable Performance Data Server version 5.4.

SAS Scoring Accelerator for Teradata

SAS Scoring Accelerator for Teradata requires Base SAS, SAS/STAT, and SAS/ACCESS Interface to Teradata. 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.*

Teradata has ended support for versions that precede Teradata 17.*xx*. For more information, see the Teradata Products Support Lifecycle and Compatibility Matrix.

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 SAS Support for Cloud and Database Variants.

DBMS Products Required:

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

For SAS 9.4M9

Starting with SAS 9.4M9, TPT API is the default and the only supported method that is used for all Teradata utility processing. For more information, see the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*.

DBMS Products Required:

- Teradata Database version 17.10 or later
- Teradata CLIv2 client libraries, TTU 17.20 or later for Linux (64-bit libraries)

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.

Important *Starting with SAS 9.4M8, the DataDirect ODBC driver uses OpenSSL 3.0 cryptographic libraries that are provided by the operating system to apply TLS to the connection. However, on Red Hat Enterprise Linux 7 and 8, these libraries are not available. A hot fix that became available in October 2024 is required in order to use SAS/ACCESS Interface to Amazon Redshift with SAS 9.4M8.*

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

SAS/ACCESS Interface to Aster

Important: *Starting with SAS 9.4M8, SAS/ACCESS Interface to Aster is not available. If you upgrade or migrate SAS Foundation to SAS 9.4M8, SAS recommends that you install and use a different SAS/ACCESS engine and data source instead. Consult the system requirements for the selected SAS/ACCESS engine or contact your SAS representative for assistance.*

If you have an existing installation of SAS/ACCESS Interface to Aster 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.

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

SAS/ACCESS Interface to Aster requires the Aster ODBC driver (64-bit version) and the bulk loading clients. To obtain the ODBC driver and bulk loading clients, contact Aster Data Technical Support.

DBMS Products Required:

- Aster Server version 4.6.3 or later
- Aster ODBC driver version 4.6.3 or later for Linux (64-bit libraries)

For SAS 9.4M3

DBMS Products Required:

- Aster Server version 6.0 or later
- Aster ODBC driver version 5.1 or later for Linux (64-bit libraries)

For SAS 9.4M4 – 9.4M7

DBMS Products Required:

- Aster Server version 6.1 or later
- Aster ODBC driver version 6.1 or later for Linux (64-bit libraries)

Refer to the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments* for information about where to install the ODBC driver and bulk loader client and how to configure your SAS software to work with them.

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 an IBM 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 are installed on AS/400, VSE, VM, MVS, and z/OS systems.

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

DBMS Products Required:

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

For SAS 9.4M1 – 9.4M6

DBMS Products Required:

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

For SAS 9.4M7 – 9.4M8

DBMS Products Required:

- IBM Db2 version 11 or later
- Client utilities for IBM Db2 11 or later

For SAS 9.4M9

DBMS Products Required:

- IBM Db2 version 11.5 or later
- Client utilities for IBM Db2 11.5 or later

SAS/ACCESS Interface to Google BigQuery

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

The required Google BigQuery client library is included with SAS/ACCESS Interface to Google BigQuery.

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 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

Important *Starting with SAS 9.4M8, the DataDirect ODBC driver uses OpenSSL 3.0 cryptographic libraries that are provided by the operating system to apply TLS to the connection. However, on Red Hat Enterprise Linux 7 and 8, these libraries are not available. A hot fix that became available in October 2024 is required in order to use SAS/ACCESS Interface to Greenplum with SAS 9.4M8.*

For SAS 9.4M9

DBMS Product Required: Greenplum Database version 6.5 or later

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

SAS/ACCESS Interface to Hadoop

Important: *Starting with SAS 9.4M9, the procedures for deploying SAS/ACCESS Interface to Hadoop have changed. Several manual steps are required in order to configure the drivers and run a configuration script. Full details are available in the SAS 9.4 Hadoop Configuration Guide for Base SAS and SAS/ACCESS.*

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

For supported Hadoop distributions and versions, refer to the SAS Support for Hadoop web page.

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 SAS 9.4M9

The Cloudera Hive JDBC Driver 2.6.25 or later is required. For more information, see `https://www.cloudera.com/downloads/connectors/hive/jdbc/2-6-25.html`.

SAS/ACCESS Interface to HAWQ

Important: *Starting 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 or later. 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 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.

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

SAS/ACCESS Interface to Impala

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

In addition, the ODBC Driver for Impala requires the unixODBC Driver Manager.

DBMS Products Required:

- Impala Server version 1.2.3 or later
- ODBC Driver for Impala version 2.5.13 or later
- The unixODBC Driver Manager. Use the latest version.

For SAS 9.4M4 – 9.4M6

DBMS Products Required:

- Impala server version 2.6 or later
- unixODBC Driver for Impala, version 2.5.41 or later
- The latest version of the unixODBC Driver Manager

For SAS 9.4M7 – 9.4M8

DBMS Products Required:

- Impala server version 3.2.0 or later
- ODBC Driver for Impala version 2.6.9 or later

For SAS 9.4M9

Supported Environments:

Cloudera (Simba) 2.7.2 or later on Cloudera Data Platform (CDP):

- CDP 7.1.x (Private Cloud)
- CDP 7.2.x (Public Cloud)

Required Database Components:

- Impala server 3.2.0 or later
- ODBC Driver for Impala 2.7.2 or later

SAS/ACCESS Interface to Informix

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

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

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

DBMS Products Required:

- Informix Client SDK 350.UC9
- Informix Server version 11.5 or later

For SAS 9.4M3 – 9.4M8

DBMS Products Required:

- Informix Client SDK 4.10FC4 (64-bit only)
- Informix Server version 11.5 or later

For SAS 9.4M9

DBMS Products Required:

- Informix Client SDK 4.10FC4 (64-bit only)
- Informix Server version 12.10 or later

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.

Important *Starting with SAS 9.4M8, the DataDirect ODBC driver uses OpenSSL 3.0 cryptographic libraries that are provided by the operating system to apply TLS to the connection. However, on Red Hat Enterprise Linux 7 and 8, these libraries are not available. A hot fix that became available in October 2024 is required in order to use SAS/ACCESS Interface to Microsoft SQL Server with SAS 9.4M8.*

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 SAS 9.4M9

DBMS Product Required: Microsoft SQL Server 2019 or later.

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

SAS/ACCESS Interface to MongoDB

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

SAS/ACCESS Interface to MongoDB requires the MongoDB C Driver ("libmongoc," the official client library for C applications). You can obtain the latest MongoDB C driver from the following website: http://mongoc.org/.

DBMS Products Required:

- MongoDB Server 6.0 or later
- MongoDB C Driver (MongoDB Client) 1.23 or later

SAS recommends using the latest versions as they become available.

SAS/ACCESS Interface to MongoDB supports MongoDB Atlas through the `LIBNAME` statement for Atlas tiers M10 and later.

You must add the location of the MongoDB C shared libraries to the shared library path environment variable specific to your operating system. For more information, 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 more information about the supported variants, see SAS Support for Cloud and Database Variants.

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 SAS 9.4M9

DBMS Products Required:

- MySQL Client version 8.0.35 or later
- MySQL Server version 8.0.42 or later

For more information about post-deployment setup for SAS/ACCESS Interface to MySQL, see the SAS/ACCESS chapter of the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*. For more information about using SAS/ACCESS Interface to MySQL, see the MySQL chapter in *SAS/ACCESS Software for Relational Databases: Reference*.

SAS/ACCESS Interface to Netezza

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

SAS/ACCESS Interface to Netezza requires an ODBC driver from IBM. To obtain the appropriate IBM Netezza ODBC driver, contact IBM Technical Support at (877) 426-6006 or visit the IBM Fix Central website, `http://www.ibm.com/support/fixcentral/`.

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 SAS Support for Cloud and Database Variants.

DBMS Products Required:

- IBM Netezza version 6.0 or later
- Client utilities for IBM Netezza version 4.6.2 or later

For SAS 9.4M2 - 9.4M5

DBMS Products Required:

- IBM Netezza version 7.0.3 or later
- Client utilities for IBM Netezza version 7.0.3 or later

For SAS 9.4M6 and Later

DBMS Products Required:

- IBM Netezza version 7.2.1 or later
- Client utilities for IBM Netezza version 7.2.1 or later

For best results, match the Netezza ODBC client version with the version of the Netezza server where it will be connected. For example, if you have a Netezza Interface server release 7.0.4, you should use the ODBC client driver release 7.0.4 with SAS/ACCESS to Netezza.

SAS/ACCESS Interface to ODBC

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

A compliant ODBC driver manager and ODBC driver (64-bit libraries) are required. ODBC drivers are often available from DBMS vendors and other third-party ODBC driver developers. The ODBC driver that you select might require additional DBMS software to access the data.

You might have to use a text editor to modify 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 the vendor of your ODBC driver.

SAS/ACCESS Interface to Oracle

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

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

To use the Bulk Load feature of SAS/ACCESS Interface to Oracle, you must install the Oracle SQL*Loader data-loading utility. 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 more information about the supported variants, see SAS Support for Cloud and Database Variants.

DBMS Products Required:

- Oracle Database 11gR2 or later
- Oracle Client 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.

Due to an incompatibility, SAS versions prior to SAS 9.4M9 do not support Oracle Client 23ai. To use an Oracle 23ai client, upgrade to *SAS 9.4M9*.

For SAS 9.4M7 – 9.4M8

DBMS Products Required:

- Oracle Database 12.1 or later
- Oracle Client 12.1 or later, except for 23ai

If your version of the Oracle Database or Client is no longer supported by Oracle, SAS cannot assist you in troubleshooting any issues that you might encounter. Representatives from Oracle are not available to advise SAS on problems with these versions.

For SAS 9.4M9

DBMS Products Required:

- Oracle Database 19c or later
- Oracle Client 19c or 23ai

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`)

For SAS 9.4M9, SAS has validated SAS/ACCESS Interface to PC Files with the following software formats:

- .jmp
- .spss
- .stata
- `.xlsx` or `.xls`

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 number 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.

SAS/ACCESS Interface to the PI System requires the OSIsoft PI System client software, PI Asset Framework Client 2014 (PI AF SDK 2.6) or later.

It also requires the .NET Framework, version 4.5 or later.

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 more information about the supported variants, see SAS Support for Cloud and Database Variants.

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 - 9.4M7

DBMS Product Required: PostgreSQL Database version 9.5.14 or later

For SAS 9.4M8

DBMS Product Required: PostgreSQL Database version 12 or later

For SAS 9.4M9

DBMS Product Required: PostgreSQL Database version 16 or later

SAS/ACCESS Interface to R/3

Base SAS is required for the installation of SAS/ACCESS Interface to SAP R/3. To use the SAS client/server support, SAS/CONNECT or SAS/SHARE is required.

SAS/ACCESS Interface to SAP R/3 requires extensive post-installation configuration before it can be used. For detailed information about configuration and additional requirements, refer to the *Post-Installation Instructions for SAS/ACCESS 9.4 Interface to R/3*.

Products Required:

- SAP NetWeaver 7.0 (Application Server ABAP) or later
- SAP NetWeaver RFC library 7.20 or later (64-bit)

SAS/ACCESS Interface to Salesforce

Base SAS is required for the installation.

SAS/ACCESS Interface to Salesforce requires a Salesforce user account that has API access enabled. For more information, see the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*, available at the following location:
`http://support.sas.com/documentation/installcenter/en/ikfdtnunxcg/66380/PDF/default/config.pdf`

Product Required: Salesforce API access, version 46.0 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: *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 (Sybase) DBMS product. These CTLIB API calls are not supported by Microsoft SQL Server; therefore, you must use SAS/ACCESS Interface to Microsoft SQL Server with an appropriate ODBC driver to access 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 SAS 9.4M9

DBMS Products Required:

- SAP HANA 2.0 SPS 11 Server or later
- SAP HANA ODBC Client (64-bit) for SPS 11 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 contact SAP Technical Support.

DBMS Products Required:

- SAP IQ Network Client version 15.4 or later
- 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 16.0
- SAP IQ Database version 16.0 or 16.1

For SAS 9.4M9

DBMS Products Required:

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

* 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 Snowflake

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

Starting with SAS 9.4M8, SAS/ACCESS Interface to Snowflake includes a required ODBC driver. With earlier maintenance releases, you must obtain and configure the required Snowflake ODBC driver and the ODBC driver manager.

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

SAS/ACCESS Interface to Spark

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

Spark 3.1 or later is required.

Starting with SAS 9.4M7, SAS/ACCESS Interface to Spark has been updated to include support for Databricks clusters. Databricks 10.4 or later (with Spark 3.2.x or later) is supported.

You can also access Spark data sources using optional JDBC drivers that you obtain and configure. SAS 9.4M8 and later support the Databricks JDBC Driver for access to Spark data in Databricks data sources. This driver enables you to establish a basic connection to Spark in Databricks by specifying a `URL=`. The driver is not included with Base SAS or SAS/ACCESS and must be downloaded and installed separately.

The open-source Apache Hive driver for JDBC or the JDBC driver provided with your Hadoop installation can be used to access other Spark data sources. For more information about obtaining and configuring a JDBC driver for Spark, see "Configuring SAS/ACCESS Interface to Spark" in Hadoop Configuration Guide for Base SAS and SAS/ACCESS.

For supported Hadoop distributions and versions, refer to the SAS Support for Hadoop web page.

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 more information about the supported variants, see SAS Support for Cloud and Database Variants.

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.

Note: *SAS 9.4M9 supports TLS 1.3. For connections to Teradata, TLS 1.2 is used transparently.*

Teradata has ended support for versions that precede Teradata 17.*xx*. For more information, see the Teradata Products Support Lifecycle and Compatibility Matrix.

DBMS Products Required:

- Teradata Database version 13.10 or later
- Teradata CLIv2 client libraries, TTU 13.10 - 16.20 for Linux (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* or later

For SAS 9.4M9

Starting with SAS 9.4M9, TPT API is the default and the only supported method that is used for all Teradata utility processing. For more information, see the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*.

DBMS Products Required:

- Teradata CLIv2 client libraries, TTU 17.20 or later (64-bit libraries)
- Teradata Database 17.*xx*

SAS/ACCESS Interface to Vertica

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

SAS/ACCESS Interface to Vertica requires the Vertica ODBC Client Driver. To obtain the Vertica Client ODBC driver, contact your database administrator or Micro Focus Technical Support.

DBMS Products Required:

- Vertica Analytic Database version 6.1 or later
- Vertica ODBC client version 6.1 or later

For SAS 9.4M3 – 9.4M5

DBMS Products Required:

- Vertica Analytic Database version 7.1 or later
- Vertica ODBC client version 7.1 or later

For SAS 9.4M6 – 9.4M8

DBMS Products Required:

- Vertica Analytic Database version 9.1 or later
- Vertica ODBC client version 9.1 or later

For SAS 9.4M9

DBMS Products Required:

- Vertica Analytic Database version 10.1 or later
- Vertica ODBC client version 10.1 or later

For information about where to install the ODBC driver and how to configure your SAS software to work with Vertica software, see the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*.

SAS/ACCESS Interface to Yellowbrick

Base SAS is required for the installation of SAS/ACCESS Interface to Yellowbrick. It was new with the seventh maintenance release of SAS 9.4 (SAS 9.4M7).

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

DBMS Product Required: Yellowbrick Database version 4.0.0-23452 or later

SAS/AF

Products Required for Build Mode

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

Other products may be required, depending on the application.

Products Required for Run Mode

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

Other products may be required, depending on the application.

Printers

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

SAS/EIS

Products Required for Build Mode

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

Other products might be required, depending on the application.

Products Required for Run Mode

- Base SAS
- SAS/EIS
- SAS/GRAPH

Other products might 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: *Starting 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 installation media.

CGI Tools and Applications

Application Dispatcher

Requires Base SAS and SAS/IntrNet Server. 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. 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 traditional graphics in SAS/OR software requires a SAS/GRAPH license.

SAS/QC

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

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