



Installation and Maintenance Instructions for SAS® 9.2 Electronic Software Delivery for Basic Installations on z/OS®



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Before You Begin

This document provides all of the information related to downloading and installing a SAS 9.2 Electronic Software basic order on z/OS systems for which you have purchased licenses. Please review this document in its entirety.

Because the SAS 9.2 Electronic Software Delivery download site limits the number of downloads that may be performed per order, the process of downloading your software from SAS should not be used as a mechanism for distributing your software across your organization. If you need to distribute the software image internally, download it to a networked location that is available to all systems where the software needs to be installed. Alternatively, you can create your own media from your downloaded image.

Be sure to review each of the topics in the “Prerequisites” and “Overview” sections before beginning your installation.

Prerequisites

System Requirements

Confirm that your system meets the minimum requirements by referring to the system requirements from the SAS 9.2 Install Center Documentation Web site (<http://support.sas.com/documentation/installcenter/922/index.html>) and selecting **Documentation for SAS 9.2 Installation on z/OS**, or referring to SAS Note 36008 (<http://support.sas.com/kb/36/008.html>).

Installation Alert Notes

Click **Outstanding Alert Status Installation Problems** from the <http://support.sas.com/notes/index.html> Web page. On the **Filter Results By** toolbar, select **z/OS** from the **Operating System** drop-down list box.

Review the Installation Alert Notes that are listed to see if they apply to this installation order.

Important: Be sure to review SAS Note 41697 at <http://support.sas.com/kb/41697>.

Software Order E-mail (SOE)

To install SAS 9.2 phase 2 on z/OS, start with the Software Order E-mail (SOE) you received from SAS Institute. This e-mail contains details such as the order number, a key, and the type of installation you have: Basic or Planning. Basic orders are generally straightforward single-machine deployments. Planning orders are more complex, multi-machine deployments. This document is for a **basic** order.

SAS installation data file (SID file)

The SAS Software Depot includes the SAS installation data file (SID file) as part of your software download, and is valid for a limited time. The SID file consists of customized installation information and product authorization information. The SAS Deployment Wizard uses the installation information in the SID file to install your licensed software and apply customized product authorization information to your system. The file is named something like `sas92_xxxxxxx_yyyyyyyy_zzz.txt`, where `xxxxxx` is your order number, `yyyyyyy` is your setnumid (a unique identifier that SAS Technical Support uses), and `zzz` is the operating system the order is licensed for.

The SID file for your software order will be located in the `sid_files` directory at the root of your SAS Software Depot or, if you have received media, on the first disk of that installation media.

If your order is more than 90 days old, the SID file shipped with the order may have expired. Contact your SAS site representative who may have received a Renewal Software Order E-mail that will contain a more recent SID file. If the site representative does not have an updated SID file, please contact SAS Customer Service at 1-800-727-0025 (press option 3).

Overview

SAS Deployment Wizard

The SAS Deployment Wizard is the common interface used to install and deploy all SAS 9.2 software. Using the SAS Deployment Wizard, you interact with the SAS Software Depot, the repository of files and data necessary to install your SAS 9.2 software. You will invoke the SAS Deployment Wizard on each system that is part of your SAS software deployment.

For basic installations, you may run the SAS Deployment Wizard in one of two ways:

- `setup.rexx`, which provides a windowing interface that requires an X11 server.
- `linemode.rexx`, which collects the necessary information to install your software via line mode prompts.

SAS Software Depot

The SAS Software Depot is a collection of SAS installation files that represents one or more orders. The SAS Software Depot is organized in a specific format that is meaningful to the SAS Deployment Wizard, which is the tool that is used to install and initially configure SAS. The SAS Software Depot contains the SAS Deployment Wizard executable, one or more deployment plans, a SID file, order data, and product data. *Please see your Software Order E-Mail for the space required for the SAS Software Depot for your order.*

Location of SAS Software Depot

Before you download the SAS Download Manager, you must first determine a location where you will store your SAS Software Depot. This may be:

- A directory on Windows or UNIX which you can FTP to a UNIX File System directory on z/OS.
- A UNIX File System directory on the z/OS machine.
- A UNIX File System remote directory that is accessible to the z/OS machine via an NFS mount.

Important:

- You should download the SAS Download Manager for the operating system on which you plan to initially download the SAS Software Depot.
- You may download your SAS Software Depot to Windows or UNIX instead of z/OS **ONLY IF**
 - You can use a UNIX file system directory on the z/OS system.
or
 - You have a third-party utility that can transfer a complete directory tree to your z/OS system.

SAS Download Manager

The SAS Download Manager is the application you must use to download your software from the SAS 9.2 Electronic Software Delivery download site to create your SAS Software Depot. It is a Java-based client that, once installed, can download selected SAS orders to your SAS Software Depot location. You **must** download the latest version of the SAS Download Manager for this order, and not use any previous version you may have installed. Instructions for this download are in the section entitled “Installation and Maintenance Process” on page 5.

CPUTIMEMAX and ASSIZEMAX or TSO region parameters

Note: This note applies only when the SAS Software Depot is downloaded directly to a z/OS UNIX File System directory.

To increase the amount of CPU time available to the SAS Download Manager download process, set the CPUTIMEMAX value in the user ID’s OMVS segment to at least 1500. In addition, this user ID will need a setting of at least 800M in the ASSIZEMAX parameter in the OMVS segment. The amount of CPU time required to download the software varies depending on the size and number of products in the order. If the SAS Download Manager receives a SIGXCPU error, you may restart the SAS Download Manager to continue a download that was already in progress.

Note: The following information applies to both download and installation.

The user ID that will be running the SAS Download Manager and SAS Deployment Wizard to install SAS 9.2 Foundation for z/OS requires a larger region setting:

- If running under OMVS, a TSO region size of at least 800 MB.
- If running UNIX-style commands using rlogin, putty, or telnet, an ASSIZEMAX of at least 800 MB.

The user ID must meet the following requirements:

- Must have a home directory that is not root.
- Must have a default program shell defined.
- Must not be a superuser.
- Must not share a uid with other user IDs.

SAS Home Location

SASHOME is the UNIX directory location where the UNIX file system components of your SAS software are installed on your machine. SASHOME is specified when you install software through the SAS Deployment Wizard for the first time, and that location becomes the default installation location for any other SAS software you install on the same machine. You will need about 3 GB of UNIX file system space for your SAS Home directory.

Many sites prefer to have SAS Home in a separate UNIX file system than their SAS Software Depot. This allows you to easily archive the SAS Software Depot and reuse that disk space. The directory path for your SAS Home location cannot be a directory within your SAS software depot.

Note: The length of the SASHOME path is limited to 54 characters.

Note: The SAS Home directory is an integral part of the SAS 9.2 installation and **MUST** exist for you to apply maintenance or hotfixes to your SAS 9.2 software.

Installing Required Third-Party Software

The checklist indicates any third-party software that must be installed before you install your SAS software, as well as which third-party software must be obtained from its vendor.

Some of your third-party software may be provided in your software order. That software is listed in your `ordersummary.html` which is available in your SAS Software Depot. Follow the path for each third-party product listed in the Third Party section of the `ordersummary.html` to locate the documentation for its installation.

X11 Server Availability

For a basic installation, you can use either `setup.rexx` or `linemode.rexx`. `Setup.rexx` provides a nicer interface but requires an X11 server.

The SAS Download Manager for z/OS and the SAS Deployment Wizard have graphical user interfaces and require the use of an X11 server. At many sites, this software is already available and running on a UNIX and/or Windows system. X11 software is available from commercial and shareware sites.

Note: If you initially download your SAS Software Depot to Windows, and install using `linemode.rexx`, an X11 server is not required.

For more information about X11 server minimum version requirements, see the Web page entitled "SAS 9.2 Support for Additional Software Products" at <http://support.sas.com/resources/thirdpartysupport/v92/othersw.html>.

Installation Action—Action A, Action B, or Action C/D

The installation process will prompt you for an installation action to choose. Determine which one of these installation actions below apply to this installation.

- **Action A** is for a new installation—if you do not currently have SAS 9.2 phase 2 installed on your system at all.
- **Action B** installs maintenance and/or new products directly into your existing production SAS 9.2 libraries and directories.
- **Action C** installs maintenance and/or new products into staging libraries for testing, after which you perform an **Action D** install to copy the staging libraries into your production libraries.

The `-nojobsubmit` command line option

Several batch jobs will be used to complete part of the deployment. By default, the SAS Deployment Wizard submits these jobs and:

- Assigns the same job name `xxxxxxA` to each job it automatically submits, where:
`xxxxxx` – is assigned the installer user ID
“A” – suffix assigned to the installer user
- Uses the FTP JES interface to track the progress of each job, and in particular determine when they have completed.

There are several reasons why the use of the FTP JES interface might not be possible or successful at your site. Below are some of the reasons for using the `-nojobsubmit` command line option which will allow you to edit and submit the batch jobs yourself:

- Your site uses JES3 (not JES2), or

- Your FTP server is configured for JESINTERFACELEVEL=2, or
- The SAS installer ID is not authorized to use FTP, or
- You need to make site-specific changes to the JCL or wish to review the JCL before submission, or
- The FTP JES interface's requirement that the jobname be the user ID performing the install suffixed with a single letter or digit is incompatible with your site's jobname requirements

If any of these conditions apply at your site, you must use the **-nojobssubmit** command line option when you run the `setup.rexx` or `linemode.rexx` execs, discussed later in this document.

Installation and Maintenance Process

The remainder of this document describes the installation and maintenance (where applicable) process in detail. At this point you have reviewed and completed all of the pre-requisites for this installation previously documented.

Upgrading an Existing SAS 9.2 Deployment

If you already have SAS 9.2 installed, determine the version of SAS 9.2 already installed by either using the **Help → About** box in an interactive SAS session, or by looking at the top of the SAS log from a batch job. This will be important in helping you plan your installation. Otherwise, if you have a previous release of SAS, skip to the section titled "Download and Install the SAS Download Manager" below.

If the version appears as **SAS 9.2 TS1M0** or **TS02.01M0P02052008**, then you have SAS 9.2 phase 1. Your new software order will not upgrade this version of SAS 9.2. You **must** perform a new installation, and the SAS Deployment Wizard will require you to specify a SAS Home location which does not already contain SAS 9.2 TS1M0.

Download and Install the SAS Download Manager

1. Choose **one** location from the following list and **create** the corresponding directory in the location where you are going to store your SAS Software Depot:
 - A directory on Windows, or UNIX, which you can FTP to a UNIX File System directory on z/OS
 - A UNIX File System directory on the z/OS machine (see "Important Notes" on page 7)
 - A UNIX File System remote directory that is accessible to the z/OS machine via a NFS mount (see "Important Notes" on page 7)
2. Download the SAS Download Manager for the target system for the download. Please note the following:
 - There is a native z/OS SAS Download Manager (**esdclient.zos**) that requires the use of an X11 server.
 - You may download your SAS Software Depot to Windows or UNIX instead of z/OS **ONLY IF**
 - you can use a UNIX file system directory on the z/OS system, **or**
 - you have a third-party utility that can transfer a complete directory tree to your z/OS system.

Based on the location and platform where you plan to store the SAS Software Depot, click **SAS Download Manager** from the SUPPORT/DOWNLOADS & HOT FIXES Web site at <http://support.sas.com/demosdownloads/setupcat.jsp?cat=SAS%20Download%20Manager>. Click **Request Download** for the appropriate platform to see the license terms and download the SAS Download Manager. You will be required to register with the SAS support site if you are not registered already. Then log in to the site to begin the download process.

SAS recommends that you retrieve a copy of the **readme** file on this page as well, since it contains the instructions for executing this application on your operating system.

Create Your SAS Software Depot Using the SAS Download Manager

When you are ready to start the download to your SAS Software Depot, follow the instructions in the **readme** file to start the SAS Download Manager. When prompted, provide the order number and SAS installation key which appear on your SAS Software Order E-mail.

When the SAS Download Manager has completed, it will have created a SAS Software Depot in the location you indicated in the SAS Download Manager dialogs. In addition, the installation process creates a **depotsummary.html** document at the root directory of your SAS Software Depot. This document describes the contents of the SAS Software Depot.

Make Your SAS Software Depot accessible to z/OS

If you did not download directly to z/OS, you must make the SAS Software Depot accessible to z/OS by either:

- NFS mount the directory on z/OS, **or**
- Transfer the SAS Software Depot to z/OS using a utility that can move a complete directory tree.
 - FTP the entire directory tree, ensuring that all files are transferred in binary to a z/OS UNIX File System directory, and the case of all file names is preserved.
 - Be sure to set the execute bits after moving from Windows. Execute the following command:
`chmod -R a+r+x < SAS Software Depot Location >`

Alternatively, if the SAS Depot is stored on UNIX:

1. Create a tar file of your existing SAS Software Depot on your UNIX machine. Execute the following command:
`tar -cvf < SAS Software Depot Location > < tar file name >`
2. FTP the tar file created in the previous step to z/OS in binary format.
3. Extract the SAS Software Depot on z/OS in the zFS directory where you want the SAS Software Depot created. Execute the following command from OMVS or rlogin:
`tar -xvf < tar file name >`

Note: The "v" option used in the tar commands is for "verbose." Information is displayed back to the terminal about each file as it is processed. It is not required.

Installing Your Software

If you will be installing using **setup.rexx**, then you **must** have an X11 server available on a Windows PC or UNIX machine at your site.

Important Notes

- Do **not** log in to z/OS as a superuser (sometimes called “root” or “UID(0)”).
- The user ID that will be running the SAS Deployment Wizard to install SAS 9.2 Foundation for z/OS must have the same requirements as noted in “CPUTIMEMAX and ASSIZEMAX or TSO region parameters” on page 3.
- You must stop all SAS Servers and processes before applying maintenance or adding new software.

Installing Your SAS Foundation Software

1. If you are using `setup.rexx`, set the `DISPLAY` environment variable to point to your X11 server.

Because the SAS Deployment Wizard is used interactively, you will need to have access to a desktop computer with an X11 server installed and active. Issue the following case-sensitive command from the z/OS UNIX shell on your z/OS system before starting the SAS Deployment Wizard:

```
export DISPLAY=<your X11 server name>:0
```

Note: *If you do not issue this command, `setup.rexx` will prompt you for the server name. Make sure that the X11 server is started.*

2. During the execution of `linemode.rexx` or `setup.rexx`, you will be prompted for a Java location. If you are using an installed JRE, be sure to use the same JRE as you are using to run the SAS Deployment Wizard for the “Select Java Runtime Environment prompt.” If you are unsure of which JRE you are using, see the messages displayed when the SAS Deployment Wizard starts up which indicate the JRE being used. Alternatively, you may call SAS Technical Support.
3. Start the SAS Deployment Wizard.

On your z/OS system, from OMVS (**not** ISHELL), rlogin, or putty, enter the z/OS UNIX shell command `./setup.rexx` or `./linemode.rexx` at the root of your SAS Software Depot to start the SAS Deployment Wizard.

The most commonly used option for a basic order using `linemode.rexx` and `setup.rexx` is:

-nojobsubmit as discussed earlier in this document, using this option means that the SAS Deployment Wizard will not submit the jobs automatically so that you can inspect and/or modify the JCL before execution. You will follow the manual steps in the section “After Running `setup.rexx` or `linemode.rexx` with the `-nojobsubmit` Command-line Option” below.

Note: *If you are using `linemode.rexx`, you must hit “enter” to get a response back.*

Note: *A full listing and description of the command-line options for `setup.rexx` may be found in the SAS Deployment Wizard User’s Guide, available from the Install Center at <http://support.sas.com/installcenter>.*

After Running `setup.rexx` or `linemode.rexx` with the `-nojobsubmit` Command-line Option

Follow these steps to complete an installation that used the `-nojobsubmit` option.

1. Once the SAS Deployment Wizard shows that the installations have completed (all green checkmarks if using `setup.rexx` or a return code of 0 if using `linemode.rexx`), batch jobs for both the foundation installation and the maintenance installation have been created in the `<HLQ>.V92D8nnn.CNTL` partitioned data set.
2. Determine the location of `<java home>` on your system. You can use either:

`<SAS Software Depot Location>/products/javaruntime_92140_mvs_xx_sp0_1/`
This represents the UNIX file system path used to invoke Java provided by SAS and licensed for deployment purposes only.

Where

`<SAS Software Depot Location>`

Represents the UNIX file system path to the location of the SAS Deployment Depot.

or

If your site already has a 31-bit version of Java installed, use that instead of the supplied JRE; for example: `/usr/lpp/java/J5.0/`

3. If you are applying only maintenance to an existing SAS installation, proceed directly to Step 7.

Otherwise, if you are performing a new SAS installation, or adding additional products to an existing SAS installation, manually submit the following batch jobs to accomplish the SAS Foundation installation.

Note: When adding some products to an existing installation, the `EDITMKI` job documented below will **not** be generated; a `MAINT0` job will be generated instead. Run the `MAINT0` job and it will start a second job named `MKSASINS`. Then continue with the `$$$NSTR0` job which is documented below.

| | |
|----------------------|---|
| <code>EDITMKI</code> | This job will start a second job called <code>MKSASINS</code> . After <code>MKSASINS</code> has completed successfully, the jobs that will perform the SAS installation will have been created in the <code><HLQ>.V92D8nnn.CNTL</code> dataset. The names of those jobs are listed in the <code>JOBINDXx</code> member, where "x" represents the install action selected: A, B, C, or D. (Note: The <code>\$\$\$NSTR0</code> and <code>\$\$\$NSTR1</code> jobs are not included in the <code>JOBINDXx</code> member, but are also part of the installation job stream.) |
|----------------------|---|

If you have site-specific JCL requirements, you can edit the jobs appropriately. When all JCL edits are complete, submit the `$$$NSTR0` job.

| | |
|--------------------------|--|
| <code>\$\$\$NSTR0</code> | This job will start the series of installation jobs listed in the <code>JOBINDXx</code> member, as well as <code>\$\$\$NSTR1</code> , to install SAS Foundation. |
|--------------------------|--|

Note: If you are running an **Action D**, you should not run the remaining steps in this section. Proceed directly to "Additional Configuration Steps" on page 10.

4. Once the install jobs have completed successfully, run the `<SASHOME>/SASFoundation/9.2/postInstall.sh` script to update the SAS configuration files and `TKMVSENV` files for proper operation.

5. If your Software Order E-mail shows a version for SAS 9.2, Rev. 920_10wnn, where **nn** is **20 or higher**, or Rev. 920_11wy, or Rev. 920_12wy, where **wy** is **any value**, then proceed to Step 7 (you do not need to run the commands in steps 5 and 6).

Update the deployment registry for SAS Foundation by running the following command:

Note: The following lines must be entered as one continuous line. There is a space before “-jar” and there are 2 hyphens before the “file” parameter.

```
<java home dir>/bin/java -jar  
<SASHOME>/deploymntreg/sas.tools.deploymntreg.jar  
--file <SASHOME>/SASFoundation/9.2/DepRegUpdateData.xml
```

Note: If your order contains additional new products, rename or delete the DepRegUpdateData.xml file before running setup.rexx again to install those products.

6. Update the SAS Versioned Jar Repository cache by running the following command:

Note: The following lines must be entered as one continuous line. Note that there is a space after “-cp” before “<SASHOME>” and there is a space after “.jar” before “com.sas.app.NonAPI.”

```
<java home dir>/bin/java -cp  
<SASHOME>/SASVersionedJarRepository/9.2/eclipse/plugins/sas.launcher.jar  
com.sas.app.NonAPI -install
```

7. Manually submit the following maintenance jobs that were created by the Maintenance Install Tool in <HLQ>.V92D8nnn.CNTL. Submit each one and wait for a successful completion before submitting the next one in the list.

- o MAINT0

Note: MAINT0 will only exist if you are performing a maintenance-only or an add-on installation. Even if you ran this job in Step 3, you must submit it again at this time.

- o MAINT1
- o MAINT2

8. Once the maintenance jobs have completed successfully, run the

```
<SASHOME>/SASFoundation/9.2/postInstall.sh
```

 script to update the SAS config files and TKMSENV files for proper operation.

9. If your Software Order E-mail shows a version for SAS 9.2, Rev. 920_10wnn, where **nn** is **20 or higher**, or Rev. 920_11wy, or Rev. 920_12wy, where **wy** is **any value**, then proceed to “Additional Configuration Steps” on page 10 (you do **not** need to run the commands in steps 9 and 10).

Update the deployment registry for SAS Foundation maintenance by running the following command:

Note: The following lines must be entered as one continuous line. There is a space before and after “-jar” and there are 2 hyphens before the “file” parameter.

```
<java home dir>/bin/java -jar  
<SASHOME>/deploymntreg/sas.tools.deploymntreg.jar  
--file <SASHOME>/InstallMisc/DepRegUpdateData.xml
```

10. Update the SAS Versioned Jar Repository cache by running the command:

Note: *The following lines must be entered as one continuous line. There is a space after “-cp” before “<SASHOME>” and there is a space after “.jar” before “com.sas.app.NonAPI”.*

```
<java home dir>/bin/java -cp  
<SASHOME>/SASVersionedJarRepository/9.2/eclipse/plugins/sas.launcher.jar  
com.sas.app.NonAPI -install
```

Additional Configuration Steps

After all installation jobs have finished, submit the VALID job in the CNTL data set and ensure that all steps complete with a return code of 0.

Consult the configuration instructions available for your operating system for product-specific post-installation steps. The configuration instructions are available from Install Center.

Note: *If you performed a staged install (Action C), once you are finished testing you should execute the SAS Deployment Wizard again and perform an Action D to copy the staged libraries to your production libraries.*

Archiving Your SAS Software Depot

For future maintenance or installation of additional SAS software products, you will need your SAS Software Depot. It can be recreated, but you may find it easier to keep a backup of your SAS Software Depot so that only updates must be downloaded in the future. SAS Note 37119 (available at <http://support.sas.com/kb/37/119.html>) contains sample jobs to back up and restore your SAS Software Depot.

Tips and Additional Information

For the latest installation news, please visit these sites for tips and additional information that may not be in your documentation:

General support for SAS issues (including a link to Tech Support)

<http://support.sas.com>

SAS 9.2 Installation and Configuration FAQ

<http://support.sas.com/kb/33/144.html>

General Information and Troubleshooting for Electronic Software Delivery

<http://support.sas.com/kb/30/950.html>

Locating the log files for SAS 9.2 installations

<http://support.sas.com/kb/37/838.html>

Documentation for a SAS 9.2 Phase 2 installation on z/OS

<http://support.sas.com/kb/36/008.html>

Technical Support

- If you need assistance with the software, we ask that only the SAS Installation Representative or the SAS Support Consultant call our Technical Support Division.
For U.S. and Canadian customers, support is provided from our corporate headquarters in Cary, North Carolina. You may call (919) 677-8008, Monday through Friday.
Customers outside of the U.S. can obtain local-language technical support through the local office in their countries. Customers in these locations should contact their local office for specific support hours. See <http://support.sas.com/techsup/contact/index.html> for contact information for local offices.
- Before calling, you may want to explore the SAS Institute Technical Support Web site at <http://support.sas.com/techsup/>. The Technical Support Web site offers a Knowledge Base, FAQs, Technical Support Documents and more that may answer your questions. This Web site also provides a mechanism for reporting problems.



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