Installation Instructions for SAS® 9.4 Installation Kit: Basic DVD Installations on z/OS

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Instructions for SAS® 9.4 Installation Kit for Basic DVD Installations on z/OS

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Overview

This document provides information related to installing a SAS 9.4 DVD Software **basic** order on z/OS systems for which you have purchased licenses. Review this document in its entirety.

Complete or provide each of the following items **before** you start the SAS installation process:

- ☐ System Requirements (pg. 1)
- ☐ Software Order Email (pg. 1)
- ☐ Current SAS Installation Data Files (SID Files) (pg. 1)
- ☐ Review and Understand Terminology (pg. 2)
- ☐ Target Location for Initial Creation of SAS Software Depot (pg. 2)
- ☐ Sufficient UNIX File System Space (pg. 3)
- ☐ User ID for the Installation that Meets Requirements (pg. 3)
- ☐ (Optional) X11 Server (pg. 3)
- ☐ Supported Version of Java (pg. **Error! Bookmark not defined.**)
- ☐ (Optional) Review SAS/IntrNet Installation Options (pg. 4)
- ☐ (Optional) Select SAS/GRAPH Map Data Sets to Install (pg. 4)

Prerequisites

System Requirements

Confirm that your system meets the minimum requirements by referring to the *System Requirements for SAS 9.4 Foundation for z/OS.*

Software Order Email

To install SAS 9.4 on z/OS, start with the Software Order Email (SOE) you received from SAS. This email 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.

Current SAS Installation Data Files (SID Files)

The SAS Software Depot includes one or more SAS installation data (SID) file or files. A SID file is valid for a limited time and consists of customized installation information and product authorization information. SAS Deployment Wizard uses the installation information in a SID file to install your licensed software and apply customized product authorization information to your system. SID files follow a naming convention in which a file called `sas94_xxxxxx_yyyyyyyy_zzz.txt` would mean `xxxxxx` is your order number, `yyyyyyyy` is your setnumid (a unique identifier used by SAS Technical Support), and `zzz` is the operating system for which the order is licensed.

The SID files for your software order are stored in the `sid_files` directory at the root of your SAS Software Depot.

If your order is more than 90 days old, the SID file shipped with the order may have expired. Check your SOE for the expiration date of the SID file in your order. If it has expired, contact your SAS site representative. That person might have received a Renewal Software Order Email that will contain a more recent SID file. Once you have created your SAS Software Depot, add the updated SID file to the `sid_files` directory in your SAS Software Depot. If your site cannot locate an updated SID file, open a case with SAS Technical Support at https://service.sas.com/csm.

Review and Understand Terminology

- `SASHOME` 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 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 `SASHOME` directory.
  Many sites prefer to have `SASHOME` 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 `SASHOME` location cannot be a directory within your SAS software depot.

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

  *The SASHOME directory is an integral part of the SAS 9.4 installation and **MUST** be kept mounted on your z/OS system after the SAS installation to support some SAS functionality.*

- SAS Deployment Wizard

  SAS Deployment Wizard is the common interface used to install and deploy all SAS 9.4 software. Using SAS Deployment Wizard, you interact with the SAS Software Depot, the repository of files and data necessary to install your SAS 9.4 software. Invoke SAS Deployment Wizard on each system that is part of your SAS software deployment.

  SAS Deployment Wizard is run by issuing **setup.rexx**, which provides a windowing interface that requires an X11 server.

  Note: *If you do not have access to an X11 server, you might be able to use SAS Deployment Wizard in console mode, allowing you to use a headless system to configure your server.*

- 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 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. *Your Software Order Email provides an estimate of the space required for the SAS Software Depot for your order.*

Target Location for Initial Creation of SAS Software Depot

You can load your SAS Software Depot from the DVD to UNIX or Windows. You must be able to:

- Mount your UNIX or Windows directory on your z/OS system, using NFS mount, or
- Use the SAS Software Depot Copy Utility or a third-party utility to transfer the complete depot directory tree to your z/OS system.

Sufficient UNIX File System Space

Your SAS installation requires the following space defined in UNIX file system directories:

- SAS Software Depot
  The SAS Software Depot is a collection of SAS installation files that represents one or more orders. The depot is organized in a specific format for SAS Deployment Wizard, which 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. *Your Software Order Email provides an estimate of the space required for the SAS Software Depot for your order.*

  This directory must be available to z/OS. It can be:
  - A UNIX file system directory on the z/OS machine.
  - A UNIX file system or Windows remote directory that is accessible to the z/OS machine via an NFS mount.

  After you have completed installing and configuring your SAS software, the SAS Software Depot is no longer required. You can archive your SAS Software Depot to tape using the process documented in SAS Note 37119.
- `SASHOME` directory
  The `SASHOME` directory is an integral part of the SAS 9.4 installation. You may want to have your SAS Software Depot and `SASHOME` directory in separate UNIX file system spaces so that you can easily recover the space from your SAS Software Depot after installation. For a SAS Foundation-only installation, 3 GB should be allowed for the `SASHOME` directory.

User ID for the Installation that Meets Requirements

The user ID used for installing SAS 9.4 must meet specific 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.

The user IDs that will be running SAS Deployment Wizard to install SAS 9.4 Foundation for z/OS require a larger region setting:

- If running under OMVS, a TSO region size and ASSIZEMAX setting of at least 1 GB.
- If running UNIX-style commands using rlogin, putty, or telnet, an ASSIZEMAX setting of at least 1 GB.

(Optional) X11 Server

SAS Deployment Wizard has a graphical user interface that requires 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.

If you do not have access to an X11 server, you might be able to use SAS Deployment Wizard in console mode to configure your server. If you use console mode, each wizard dialog is represented in text. Console mode cannot be used on your SAS Middle Tier.

For more information about X11 server minimum version requirements, see the SAS 9.4 Support for Other Third-Party Software Products page.

Supported Version of Java

An IBM Java Software Development Kit (JDK) is required. Obtain and install it before you perform the SAS installation.

With SAS 9.4M9 on z/OS, IBM Java 21.0.4 or later (64-bit) is required. The following SAS hot fixes must be downloaded along with your SAS 9.4M9 order, and they must be applied with the initial installation in order to support this change to the Java requirement:

- **P6Z001** for Threaded Kernel Java 9.4_M9
- **P7N001** for Base SAS JAR Files for z/OS 9.4
- **P7P001** for SAS Integration Technologies JAR Files for z/OS 9.4

The SAS 9.4 Support for Java page on the SAS Technical Support site describes the Java requirements for each maintenance release of SAS 9.4 Foundation.

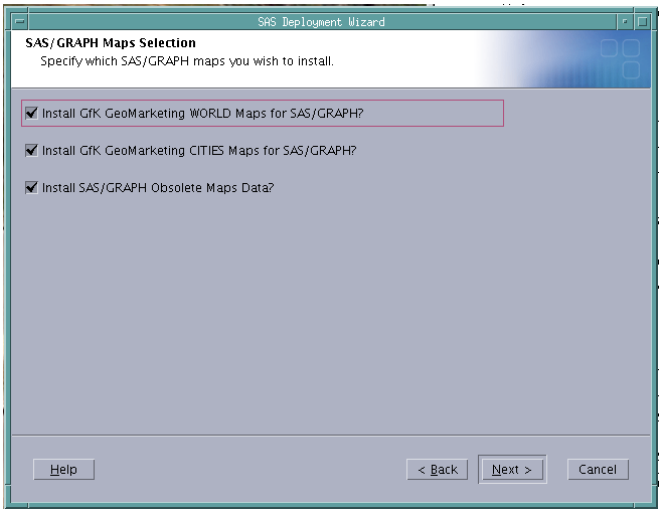
(Optional) Review SAS/IntrNet Installation Options

If your order includes SAS/IntrNet, review the section on SAS/IntrNet in the *Configuration Guide for SAS 9.4 Foundation for z/OS* so that you are prepared to enter the appropriate values for your web server directory paths and URL values.

(Optional) Select SAS/GRAPH Map Data Sets to Install

Starting in SAS 9.4M3, if your site is licensed for SAS/GRAPH, you have the option to select which SAS/GRAPH Map products to install. SAS has split out the Map data sets that were included in SAS/GRAPH in order to help users save space by choosing Map data sets to install. These options allow you to select SAS/GRAPH Maps products to install. For information about Maps data set space, refer to the *System Requirements for SAS 9.4 Foundation for z/OS*.

If your site is licensed for SAS/GRAPH, when you run SAS Deployment Wizard, the **SAS/GRAPH Maps Selection** dialog box displays:



The Map products can be selected in any combination.

- **GfK GeoMarketing WORLD Maps for SAS/GRAPH** contains the new Map data sets, which replace SAS/GRAPH Obsolete Maps Data. To use PROC GMAP, you must install either GfK GeoMarketing WORLD Maps for SAS/GRAPH or SAS/GRAPH Obsolete Maps Data, or both.

- **GfK GeoMarketing CITIES Maps for SAS/GRAPH** contains the Map data sets that are used by PROC GEOCODE. If these maps are not installed, some of PROC GEOCODE will work (such as ZIP code support), but cities support will not work.
- **SAS/GRAPH Obsolete Maps Data**

Note: *If you install all 3 SAS/GRAPH Map data sets, additional space is used. For more information on the required space for SAS/GRAPH Map data sets, refer to the System Requirements for SAS 9.4 Foundation for z/OS.*

Note: *To remove or re-install SAS/GRAPH Maps, see SAS Note 55984.*

Installation Process

The installation process consists of the following steps:

Step 1. Creating the SAS Software Depot

Step 2. Installing and Maintaining Your Software

Step 3. Validate Installation and Post-Configuration

Step 4. Archiving Your SAS Software Depot

Follow these steps in order to install your SAS software.

Step 1. Creating the SAS Software Depot

Follow these steps to create your SAS Software Depot:

1. Confirm that you have received the software that you expected.
   - In your installation kit, find the SAS Order Information document, which lists the software that you ordered. Verify that the SAS products and servers listed are correct, and that they match what you expected to receive.
   - The SAS Software Depot is a network-accessible repository of your SAS software. After you have created your SAS Software Depot, the SAS Order Information document will also be available from your SAS Software Depot at `<SAS Software Depot Location>/install_doc/<order number>/soi.html`.
   - After you have created your SAS Software Depot, you may view an expanded list of the software that makes up your order. Consult the ordersummary.html, located in your SAS Software Depot at `<SAS Software Depot Location>/install_doc/<order number>/ordersummary.html`.
2. Insert your media into a DVD drive on either a Windows or UNIX system to create or add to your SAS Software Depot.
   - If you already have a SAS Software Depot from a 9.4 installation, you should use the same location for creating this SAS Software Depot. Only new products, releases, and maintenance need to be added to the SAS Software Depot, saving disk space. If you are creating a new SAS Software Depot, select a location that either is, or can be, NFS-mounted on z/OS, you can either use the SAS Software Depot Copy Utility or confirm that you have a third-party FTP utility that can move the entire directory tree to the z/OS file system. The directory name must not contain blanks.

- For **Windows** users:
  - The media should autoplay. If it does not, double-click **`setup.exe`** at the root of your DVD to start SAS Deployment Wizard.
  - Using SAS Deployment Wizard, select **Create or Add to a SAS Software Depot** to create or add to your SAS Software Depot.
  - When you specify the directory path name for the SAS Software Depot, the name should not contain blanks.
- For **UNIX** users:
  - UNIX users should mount their DVD with the appropriate mount command and execute `setup.sh` at the root of the DVD.

    Note: *If you launch SAS Deployment Wizard from an order that spans media, do not use a shell in the removable media's file system when you launch* `setup.sh`*. In addition, do not invoke SAS Deployment Wizard from the File Manager. Either of these methods for launching SAS Deployment Wizard will create a* Device busy *condition, which prevents disk swapping later in the deployment process.*
  - Using SAS Deployment Wizard, select **Create or Add to a SAS Software Depot** to create or add to your SAS Software Depot.
  - When you specify the directory path name for the SAS Software Depot, the name should not contain blanks.

Make Your SAS Software Depot Accessible to z/OS

You must make the SAS Software Depot accessible to z/OS by using one of the following methods:

- NFS mount the directory on z/OS
- Use the SAS Software Depot Copy Utility (which is provided in your SAS Software Depot. You can find instructions for this utility in the *SAS Deployment Wizard and SAS Deployment Manager 9.4: User's Guide*.
- Transfer the SAS Software Depot to z/OS using a third-party utility such as Filezilla, WS-FTP, Blue Zone, etc., that can move a complete directory tree.
  1. 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.
  2. Be sure to set the execute bits after moving from Windows. Execute the following command:
     `chmod -R a+r+x <SAS Software Depot Location>`
- As an alternative, if the SAS Software Depot is stored on UNIX, follow these steps:

  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.*

Step 2. Installing and Maintaining Your Software

The remainder of this document describes the installation and maintenance (where applicable) process in detail. At this point, you should have reviewed and completed all the prerequisites for this installation.

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

The installation process prompts you to select an installation action.

- **Action A** is for a new installation—if you do not currently have SAS 9.4 installed on your system at all.
  When you perform a new installation (Action A), SAS Deployment Wizard also installs any hot fixes included in the order.

  Orders that are downloaded include hot fixes selected by SAS as being appropriate for SAS Deployment Wizard to install during a deployment.

  Note: *Orders received on DVDs do not initially include hot fixes.*
- **Action B** installs maintenance or new products directly into your existing production SAS 9.4 libraries and directories. If you are applying maintenance and also installing new products, you **must** invoke SAS Deployment Wizard **twice**.

  Important: *With Action B, some additional configuration is required for the TKMVSENV file. For an upgrade to SAS 9.4M9, a new location for the Java Runtime Environment (JRE) must be specified. For more information, see SAS Note 60246.*
- **Action C** is used when adding maintenance or new software products to an existing installation. This action installs the updates in staged libraries, allowing you to test before copying the updates to production. If you are applying maintenance and also installing new products, you **must** invoke SAS Deployment Wizard **twice**.

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 SAS Deployment Wizard to install SAS 9.4 Foundation for z/OS must have the same requirements as noted in "User ID for the Installation that Meets Requirements" on page 3.
- If you are applying maintenance or adding software to an existing installation, you must stop all SAS servers and processes before updating your installation.
- If you select **Action B** or **Action C**, you **must** use the same high-level qualifier that you specified with the original installation.

Installation Steps

By default, SAS Deployment Wizard runs using a text-based interface and creates the installation batch jobs for you but does not execute them.

1. Before you start SAS Deployment Wizard, decide whether you will use a graphical user interface or a text-based interface
   a. **Using the graphical interface**: If you want to use a graphical user interface in SAS Deployment Wizard, you must use an X11 server.

To use an X11 server, set the `DISPLAY` environment variable to point to your X11 server. Issue the following case-sensitive command from the z/OS UNIX shell on your z/OS system before starting SAS Deployment Wizard:

```
export DISPLAY=<your X11 server name>:0.0
/<SAS Software Depot>/setup.rexx -x11
```

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 on your workstation before starting the install.*

b. Using the text-based interface: If you choose not to use the x11 interface, the dialog boxes that would have been displayed are represented in text.

When you run SAS Deployment Wizard in the default text-based or console mode to perform a deployment without a graphical display, ensure that the `DISPLAY` environment variable is unset, as opposed to it being set to a blank value (`DISPLAY=`). For example:

```
unset DISPLAY
/<SAS Software Depot>/setup.rexx
```

Note: *During execution in text or "console" mode, if you are instructed to enter a sequence that includes angle brackets, such as "Enter <q> to quit," you must include those symbols.*

2. Decide whether SAS Deployment Wizard will run the installation batch jobs for you.

By default, SAS Deployment Wizard creates the installation batch jobs for you but does not submit them. Also by default, SAS install jobs are chained. To force each job to be submitted manually, use the `-nojobchain` option. The `-nojobchain` option is ignored if `-jobsubmit` is specified.

If you use the `-jobsubmit` option, SAS Deployment Wizard will:

- Assign the same job name xxxxxxA to each job it automatically submits, where: xxxxxxx is assigned the installer user ID "A" – suffix assigned to the installer user.
- Use the FTP JES interface to track the progress of each job, and in particular determine when they have completed.

  If any of the following conditions are true, you cannot use the `-jobsubmit` option, and you must submit the installation batch jobs manually:
  - Your site uses JES3 (not JES2)
  - Your FTP server is configured for JESINTERFACELEVEL=2
  - The SAS installer ID is not authorized to use FTP
  - You need to make site-specific changes to the JCL or wish to review the JCL before submission
  - The FTP JES interface's requirement that the job name be the user ID performing the install suffixed with a single letter or digit is incompatible with your site's job name requirements.

Starting in SAS 9.4M4, if you use the `-jobsubmit` option, SAS Deployment Wizard will:

- No longer prompt for the host name, user ID and password
- Allow you to use the `-jobsubmit` option with both JES2 and JES3
- Use the JES SYSOUT API (SAPI) to track the progress of each job and determine when jobs have completed

Examples:

To have SAS Deployment Wizard submit and monitor the installation batch jobs:

```
/<SAS Software Depot>/setup.rexx [-x11]  -jobsubmit
```

To submit the jobs manually after SAS Deployment Wizard completes:

```
/<SAS Software Depot>/setup.rexx [-x11]
```

To submit the jobs manually and specify that they are not chained after SAS Deployment Wizard completes :

```
/<SAS Software Depot>/setup.rexx [-x11] –nojobchain
```

3. Invoke SAS Deployment Wizard on your z/OS system, from OMVS , rlogin, or putty. You cannot execute it from ISHELL.

   ```
   /<SAS Software Depot>/setup.rexx [-x11] [-jobsubmit]
   ```

   - Use the **Help** button or <h> command for more information about each dialog.
   - For more detailed information, see the *SAS Deployment Wizard and SAS Deployment Manager 9.4: User's Guide*.

4. Proceed through the dialog boxes or prompts until SAS Deployment Wizard completes.

5. If you installed without specifying `-jobsubmit`, after SAS Deployment Wizard has completed with all green check marks or "S" indicating "Completed Successfully," run the series of jobs indicated in the JOBINDEX member of the *<HLQ>*`.INSTALL.CNTL` data set. The number of batch jobs will vary based on the content of your order. The member JOBINDEX in the *<HLQ>*`.INSTALL.CNTL` data set contains the list of jobs that must be executed.

   a. You might want to edit each of the jobs listed in the JOBINDEX member of the `INSTALL.CNTL` data set to provide any required site-specific accounting information. You might also want to edit the user-defined fields in the JCL statements (such as UNIT values, SMS classes, etc.), to conform to standards used at your site.

   b. Submit the first job. Each job will submit the subsequent job as its final step. If you want to submit each job individually, you must edit the last step that submits the next job through the internal reader. Delete the IEBGENER step at the end.

      Note: *After submitting an install job, the <HLQ>.INSTALL.CNTL library cannot be open in edit mode. The job will wait until it can get exclusive access (DISP=OLD) to the <HLQ>.INSTALL.CNTL library.*

   c. A separate INSTHELP job is written to *<HLQ>*`.INSTALL.CNTL` and is an **optional** job to run. It represents the online Help and, depending on your system and other jobs running, could take an hour or more to complete. If you want to run this job, SAS recommends running it **after** the initial installation has completed.

Updating an Existing Installation

If you are adding a new order to an existing installation, and the jobs listed in the JOBINDEX member were named MAINT01 through MAINTnn and MANTHELP (update to the Help system), SAS Deployment Wizard went into update mode and updated your installed SAS products to the current level. **If your order contained new SAS products, you must invoke SAS Deployment Wizard again** to install those products, following the same instructions that are described in Installation Steps.

Step 3. Validate Installation and Post-Configuration

After all installation jobs have completed, submit the VALID job in the `<HLQ>.INSTALL.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.

***Notes**:*

- *The PROMOTE job is represented as `PROMOTn`. If you performed Action C, use the CLISTs, REXX EXECs, and JCL procedures in the <HLQ>.SL. data sets to test the additional products. When your testing is complete, submit the `PROMOT1` job to copy the updates to your production libraries. `PROMOT1` will launch the rest of the `PROMOTn` jobs. You **must** exit the `<HLQ>.INSTALL.CNTL` dataset after submitting the `PROMOTn` job suite.*
- *Before copying an installation to another system, contact SAS Technical Support.*

Step 4. 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 might 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 contains sample jobs to back up and restore your SAS Software Depot.

Tips and Additional Information

For the latest installation news, 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`

Technical Support SAS 9.4 Hot Fix downloads

`http://ftp.sas.com/techsup/download/hotfix/hotfix.html`

Locating the log files for SAS 9.4 installations

`http://support.sas.com/kb/49/756.html`

Documentation for a SAS 9.4 installation on z/OS

`http://support.sas.com/documentation/installcenter/94/mvs/index.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 might want to explore the SAS Technical Support website at `http://support.sas.com/techsup/`. The Technical Support website offers a Knowledge Base, FAQs, Technical Support Documents and more that may answer your questions. This website also provides a mechanism for reporting problems.

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