Installation Instructions for SAS® 9.4 Electronic Software Delivery: Planned Installations on z/OS

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Before You Begin—Prerequisites

This document provides information related to downloading and installing a SAS 9.4 Electronic Software **planned** order on z/OS systems for which you have purchased licenses. Review this document before you begin your SAS deployment.

Because the SAS 9.4 Electronic Software Delivery download site limits the number of downloads that can 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. As an alternative, you can create your own media from your downloaded image.

You **MUST** complete each of the **required** items below (the last few items may be optional) **before** beginning your SAS installation. The following topics are discussed in this section:

- ☐ Verify System Requirements (pg. 1)
- ☐ SAS Software Order Email (SOE) (pg. 1)
- ☐ Current SAS Installation Data Files (SID Files) (pg. 2)
- ☐ Review and Understand Terminology (pg. 2)
- ☐ Target Location for Initial Download of SAS Software Depot (pg. 3)
- ☐ Sufficient UNIX File System Space (pg. 3)
- ☐ User ID for the Installation that Meets Requirements (pg. 3)
- ☐ SAS Deployment Plan (pg. 4)
- ☐ Review Pre-installation Checklists (pg. 4)
- ☐ Install Required Third-Party Software (pg. 4)
- ☐ (Optional) X11 Server (pg. 5)
- ☐ (Optional) Install and Configure SAS Metadata Server on a Separate Host (pg. 5)
- ☐ (Optional) Review SAS/IntrNet Installation Options (pg. 5)
- ☐ (Optional) Select SAS/GRAPH Map Data Sets to Install) (pg. 6)

Prerequisites

Verify System Requirements

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

SAS Software Order Email (SOE)

To install SAS 9.4 on z/OS, start with the SAS Software Order Email (SOE) that you received from SAS. This email contains details such as the order number, a key, and the type of installation you have: Basic or Planned. Planned orders are more complex, multi-machine deployments. This document is for a **planned** order.

Current SAS Installation Data Files (SID Files)

The SAS Software Depot includes one or more SAS installation data (SID) file or files as part of your software download. A SID file is valid for a limited time and consists of customized installation information and product authorization information. The 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.

If you plan to host your SAS Metadata Server on z/OS, you will be installing a set of 64-bit libraries in addition to the standard 31-bit libraries, which have a separate SAS site number and a separate SID file. The SID file for the 64-bit metadata installation includes "SAS Metadata Server."

The SID files for your software order will be located in the `sid_files` directory at the root of your SAS Software Depot.

If your order is more than 90 days old, one or more of the SID files shipped with the order may have expired. Check your SOE for the expiration date of the SID files in your order. If they have expired, contact your SAS site representative, who might have received a Renewal Software Order Email with more recent SID files. Once you have created your SAS Software Depot, store the updated SID files in the `sid_files` directory in your SAS Software Depot.

During the installation, you are prompted for the location of your SID file. Be sure to select the SID file with current data.

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 the SAS Deployment Wizard for the first time. You must use the same `SASHOME` directory for both 64-bit and 31-bit SAS installations in a single configuration. Allocate about 3 GB of UNIX file system space for your `SASHOME` directory.

  You might prefer to have `SASHOME` in a separate UNIX file system from the SAS Software Depot. This allows you to easily archive the SAS Software Depot and reuse disk space. The directory path for the `SASHOME` location cannot be a directory within the 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. It **MUST** be kept mounted on your z/OS system as part of the SAS deployment 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. You invoke SAS Deployment Wizard on each system that is part of your SAS software deployment.

- **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 for SAS Deployment

Wizard. 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 Download 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 can be:

- A directory on Windows or UNIX that 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.

Sufficient UNIX File System Space

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

- SAS Software Depot
  If you are going to store your SAS Software Depot directly on z/OS, you must have sufficient UNIX file system space for the depot before you begin downloading your order. The size of the SAS Software Depot is documented in your SOE.

  You do not need the SAS Software Depot after you have completed installing and configuring your SAS software. You can archive your SAS Software Depot to tape using the process documented in SAS Note SN 37119.
- `SASHOME` directory
  The `SASHOME` directory is an integral part of the SAS 9.4 installation. You might 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.
- SAS configuration directory
  This directory is where your SAS server scripts, configuration files, and metadata server repositories will be located. The amount of space required depends on your usage, but you should have at least 2 GB of space for this directory, 3 GB if you are migrating metadata from an earlier SAS release. The configuration directory cannot be a subdirectory of the `SASHOME` directory. The `SASHOME` directory and the SAS configuration directory can be in the same UNIX file system space.

User ID for the Installation that Meets Requirements

The user ID used for downloading your software or 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 either the SAS Download Manager or 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.

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 5000. 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 can restart the SAS Download Manager to continue a download that was already in progress.

SAS Deployment Plan

To install and configure SAS servers that are part of a planned order, you must have a deployment plan. The deployment plan is an XML-based description of the topology for your SAS system. The plan file provides instructions to SAS Deployment Wizard about software components to deploy on each machine.

SAS Deployment Wizard contains a set of standard deployment plans that can be used by many sites with no customization. These are documented at `http://support.sas.com/demosdownloads/setupcat.jsp?cat=Standard+Deployment+Plans`. If you are working with a SAS consultant in the deployment of your software, that consultant might create a customized deployment plan for your installation.

Review Pre-installation Checklists

You will need to perform some pre-installation tasks, such as creating server user IDs, reserving ports, etc., before installing a planned order. For example, you can record information such as the user IDs for special SAS users, port numbers, and the installation locations of third-party products used for this installation. If you are using one of the standard deployment plans, you can download the plan with a customized checklist for that plan from the library of standard deployment plans. If you received a customized plan, that plan includes a customized pre-installation checklist.

Install 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. An example is the X11 Server, described in the next section. Obtain that software and install it according to the vendor's instructions.

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

You must have a supported level of IBM Java installed for a planned installation with SAS 9.4. 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 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) X11 Server

The SAS Download Manager for z/OS and the SAS Deployment Wizard have graphical user interfaces which require the use of an X11 server, if available. 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 the SAS Download Manager and SAS Deployment Wizard in console mode, allowing you to use a headless system to configure your server. If you use console mode, each dialog used in the deployment of your SAS software is represented in text. Console mode cannot be used on your middle tier.

Note: *If you are configuring SAS Data Integration Studio or SAS IT Resource Management, you* ***must*** *configure with an X11 server.*

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

(Optional) Install and Configure SAS Metadata Server on a Separate Host

You **must** install and configure SAS first on the machine where SAS Metadata Server will run. If your Metadata Server will be on a machine other than z/OS, deploy it **before** you attempt to deploy your servers on z/OS.

(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 the third maintenance release of SAS 9.4, if your site is licensed for SAS/GRAPH, you have the option to select SAS/GRAPH Map products to install. SAS has split out the Map data sets that were included in SAS/GRAPH. You can save space by selecting data sets and 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*.

Installation Process

Overview

The installation process consists of the following steps:

Step 1. Creating the SAS Software Depot

Step 2. Installing and Maintaining Your Software

Step 3. Validating Installation and Post-Configuration

Step 4. Managing Server Sessions

Step 5. Installing SAS 9.4 Middle-Tier and Client Software from the SAS Software Depot

Step 6. Archiving Your SAS Software Depot

Follow these steps in order to install your SAS software.

Step 1. Creating the SAS Software Depot

SAS Download Manager

You must use SAS Download Manager to download your software from the SAS 9.4 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.

Important:

- You should download the SAS Download Manager for the operating system to which you plan to initially download the SAS Software Depot.
- You can 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 (for example, via NFS mount).
    or
  - you can FTP your SAS Software Depot to z/OS, using either a third-party utility that can transfer a complete directory tree, or our provided utility, the SAS Software 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* at `http://support.sas.com/documentation/installcenter/94/mvs/index.html`.

Download and Install the SAS Download Manager

Download SAS Download Manager for the target system for the download.

Note: *To download directly to z/OS, you must download the z/OS SAS Download Manager.*

You can obtain SAS Download Manager from http://support.sas.com/downloadmgr. Click **Request Download** for the appropriate platform to see the license terms and download the SAS Download Manager. You are required to register with SAS Support if you are not registered already. Then log in to the site to begin the download process.

A README file contains 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 from your SOE.

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 in one of the following ways:

- NFS mount the directory on z/OS, **or**
- Use the SAS Software Depot Copy Utility, **or**
- 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 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 of the pre-requisites for this installation previously documented along with the pre-installation steps in the *SAS 9.4 Intelligence Platform: Installation and Configuration Guide*.

Installation Action—Action A or Action B

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, or if you want to create a new SAS 9.4 installation.

  When you perform a new installation (Action A), the SAS Deployment Wizard will also install any hot fixes included in the order. Orders that are downloaded include hot fixes

selected by SAS as being appropriate for the SAS Deployment Wizard to install during a deployment.

Note: *Orders received on DVD do not initially include hot fixes.*

- **Action B** installs maintenance or new products directly into existing SAS 9.4 libraries and directories. If you are deploying a planned order that includes SAS Metadata Server, you must run SAS Deployment Wizard from the depot **twice**, once using the `-z64` option, and then again without the `-z64` option. Then run SAS Deployment Manager from `SASHOME` to complete configuration.

  Important: *In order to avoid overwriting local site customizations to `<HLQ>.TKMVSENV` (`TKMVSENV`), a new member in the same dataset is created by the update process:* `NEWVSENV`. *You must manually merge the entries from `NEWVSENV` into `TKVMSENV` so that any customizations are maintained, while incorporating changes that come with the SAS 9.4 updates. For example, if you are upgrading from SAS 9.4M8 or an earlier maintenance release, the paths to Java locations must be updated to the settings from `NEWVSENV`.*

  If you have not made customizations to `TKMVSENV`, you can overwrite the current `TKMVSENV` with `NEWVSENV`.

Planning Metadata Migration from SAS 9.1.3, SAS 9.2, or SAS 9.3

If you are migrating metadata from SAS 9.1.3, SAS 9.2, or SAS 9.3, you must prepare your software for migration. To prepare your SAS 9.1.3, SAS 9.2, or SAS 9.3 deployment for migration to SAS 9.4, follow the instructions in the *SAS 9.4 Intelligence Platform: Migration Guide*.

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 9.4 Foundation for z/OS must meet the 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**, you **must** use the same high-level qualifier that you specified with the original installation.

Installation Steps

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

1. 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. If you are configuring SAS IT Resource Management or SAS Data Integration Server, you must use an X11 server, otherwise an X11 server is optional. Note that the X11 server software would run on your Windows or UNIX machine to provide the windowing interface for SAS Deployment Wizard.

   If you are using 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 prompts you for the server name. Make sure that the X11 server is started on your workstation before starting the installation.*

b) **Using the text-based interface**: If you do not use the x11 interface, the dialogs 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 being set to a blank value (that is, `DISPLAY=`). Here is an 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 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, the 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 will not be able to 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 want 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 (TS1M4), 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 in particular determine when jobs have completed.

Here are some 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
```

In SAS 9.4, SAS Metadata Server runs only in 64-bit mode and requires a separate installation. If you plan to run your Metadata Server on z/OS, you must invoke SAS Deployment Wizard multiple times. This should be your first invocation of SAS Deployment Wizard.

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

Important: *If your SAS Metadata Server will be deployed on another machine, the Metadata Server must already be installed, configured, and running on that machine. Skip to Step 3 to invoke SAS Deployment Wizard for the 31-bit installation.*

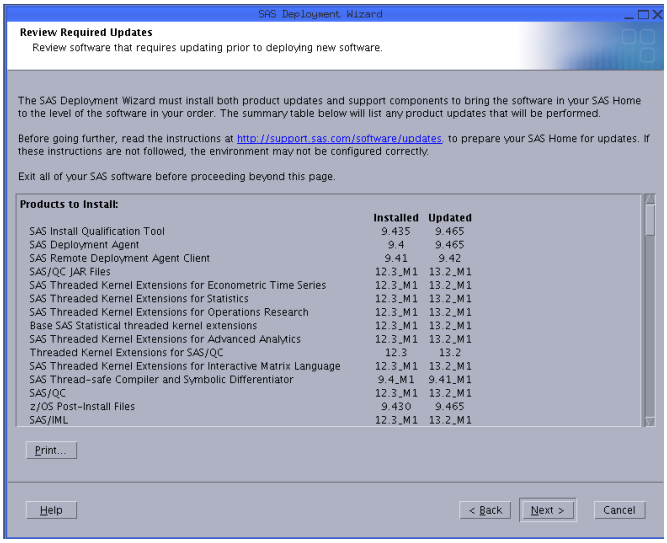
3. Invoke SAS Deployment Wizard with the required option `-z64`.

   ```
   /<SAS Software Depot>/setup.rexx -z64 [-jobsubmit] [-x11]
   ```

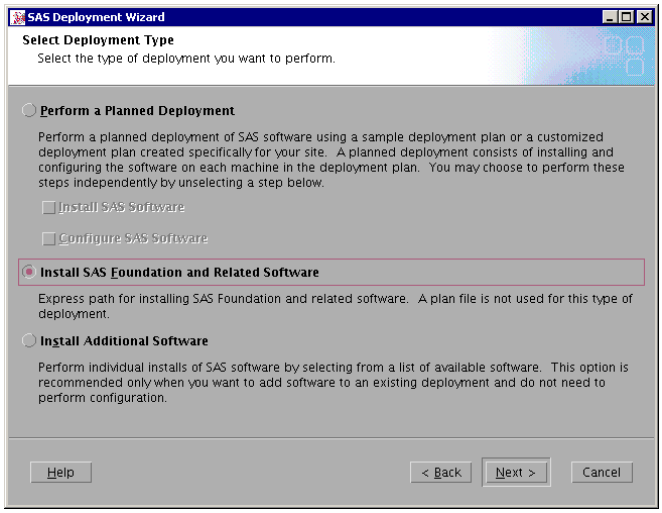
   Note: *You must run setup.rexx from OMVS, rlogin, or putty. You cannot execute it from ISHELL.* To execute the setup.rexx command, navigate to your SAS Software Depot directory in OMVS.

4. Select "Install SAS Software" on the first dialog box.

   If you are applying maintenance to an existing installation, you will go into update mode and be prompted to **Review Required Updates** as shown:

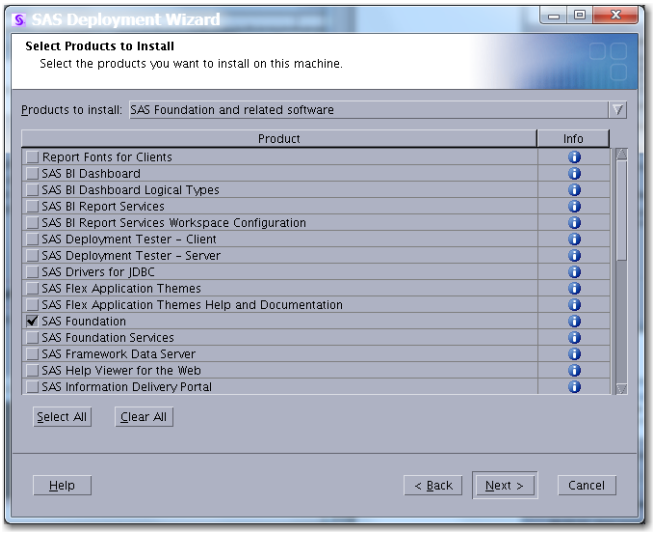


5. Proceed through the remaining dialogs to apply maintenance. Then skip to Step 7 on page 12.
6. **For a new installation**, the next dialogs show some key values. You are prompted for the deployment type on the second dialog. For the 64-bit installation, select **Install SAS Foundation and Related Software** as shown below:

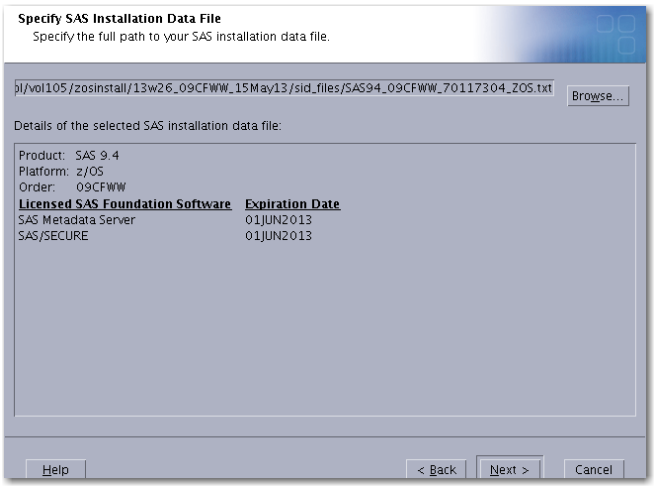


a) When prompted for your SASHOME directory, note that you will use the same directory for both the 64-bit and 31-bit installations.

b) Select only SAS Foundation in the "Select Products to Install" dialog.



c) To ensure that you are using the correct SID file for the z64 install, verify that the only products that appear are the SAS Metadata Server and possibly SAS/SECURE.



d) **Use a different high-level qualifier for this installation than for the main SAS installation**. (It could be the main SAS high-level qualifier with an additional level, such as SAS.SAS94.Z64). Note that the load module libraries created for the 64-bit installation do **NOT** need to be program-controlled, as is the case for libraries for the 31-bit installation.

Note: *When editing the job cards to match your system standard, be sure to maintain a minimum region of 128M or some installation jobs will fail.*

e) If you executed SAS Deployment Wizard without specifying `-jobsubmit`, after SAS Deployment Wizard has completed successfully, run the series of jobs indicated in the JOBINDEX member of the `<HLQz64>.INSTALL.CNTL` data set. After you submit the first job, each job submits the subsequent job as its last step.

7. Invoke SAS Deployment Wizard for the 31-bit install. Note that this will be the second invocation if you installed your Metadata Server on z/OS following the instructions in Step 2.

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

   The most commonly used options for configuring servers are as follows:

   `-record` records the values that you enter for SAS Deployment Wizard prompts in the file specified by the `-responsefile` option. This is convenient when you have to enter many options such as port numbers and you may have to rerun the configuration later. Note that once you have saved a response file, you can use it in a subsequent invocation of SAS Deployment Wizard by specifying `-responsefile` without the `-record` option.

   `-responsefile` if `-record` is also specified, a new file is created with the responses entered in that invocation of SAS Deployment Wizard. If `-record` is not specified, an existing response file from a previous run will be used to fill in the responses from that previous run. Your installation user ID must have write access to the specified file.

   `-deploy` if you specify `-record` you must also specify `-deploy` to actually deploy the software.

Example

```
setup.rexx -record -responsefile /u/userid/sdwresponse.properties
```

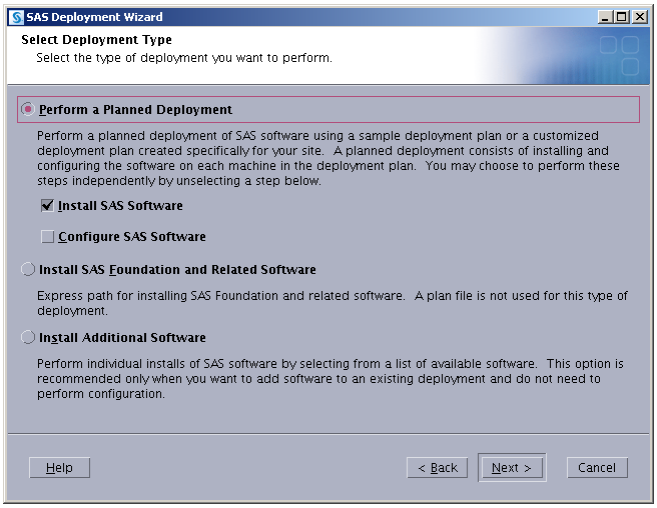
Notes:

- By default, no deployment occurs when running in a record mode. In order to force a deployment while recording, use `-deploy`. For example:

  ```
  /<SAS Software Depot>/setup.rexx -record -responsefile
     /u/userid/sdwresponse.properties -deploy
  ```

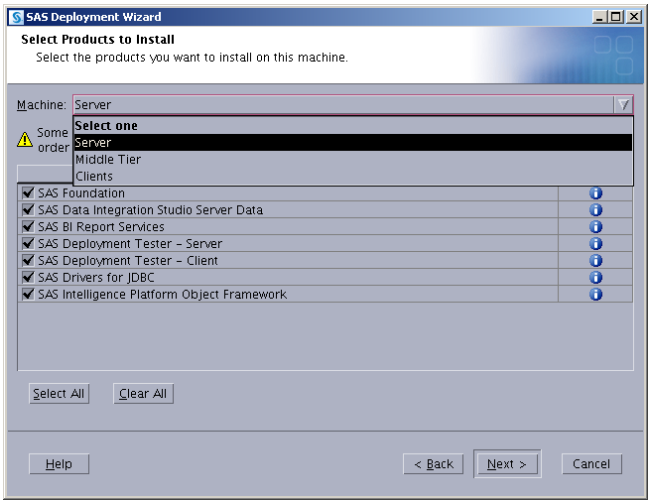
- If you specify a file location where a file already exists, the pre-existing file will be overwritten by the SAS Deployment Wizard.
- A full listing and description of these command-line options for setup.rexx may be found in the *SAS Deployment Wizard User's Guide*, available from the Install Center at `http://support.sas.com/installcenter`.

8. Before you configure your servers, you must have the SASCP64 module installed where it can be accessed as a TSO or UNIX command. For TSO, the SASCP64 module must be in a TSO command library or in STEPLIB. If you use rlogin to access your z/OS system, the SASCP64 module must be in link list.
9. If you do not have the SAS SVC installed from a previous SAS 9 release, you must also install it before completing the configuration steps. You can do this by installing (but not configuring) 31-bit SAS and then obtaining the SVC module from the load library, or you can download it from SAS Note 43697.
10. (New SAS installations only) If you are applying maintenance, proceed to Step 8. Use SAS Deployment Wizard to install the 31-bit software. If you specify the `-jobsubmit` option, you can configure your servers in the same invocation of SAS Deployment Wizard. Otherwise, select only **Install SAS Software** as shown:



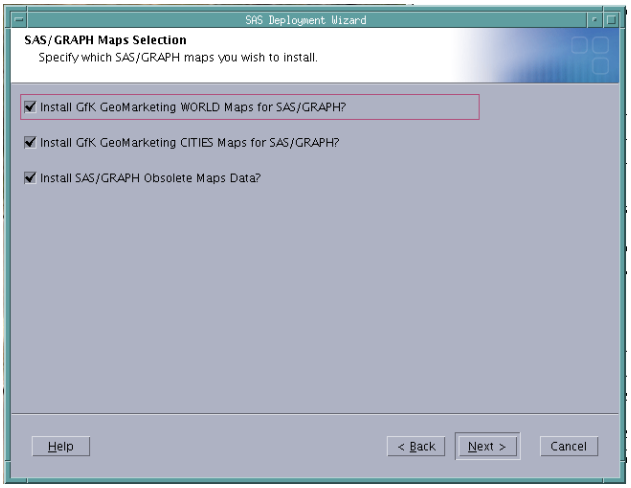
Click the **Help** button for more information about the choices available in each page.

One common point of confusion in SAS Deployment Wizard is selecting the **Machine** for a multi-machine plan. For z/OS, you would typically select **Server**, **SAS Application Server**, or **SAS Metadata Server**, depending on the deployment plan and the machine.



Be sure to use the same JRE that you are using to run SAS Deployment Wizard for the "Select Java Runtime Environment prompt" (see the image below). If you are unsure of which JRE you are using, messages are displayed when SAS Deployment Wizard starts up, indicating the JRE in use.

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. In order 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, then some of PROC GEOCODE will work (such as ZIP code support) but cities support will not work
- **SAS/GRAPH Obsolete Maps Data**

Notes: *If you install all 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.*

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

11. Proceed through the dialogs or prompts until SAS Deployment Wizard completes. Remember to specify a region of at least 96M when specifying your JOB JCL.

    Note: *If you did run with the* `-jobsubmit` *option, verify that all batch jobs submitted by SAS Deployment Wizard ran successfully. The JOBINDEX member of* `<HLQ>.INSTALL.CNTL` *shows which jobs should have executed.*

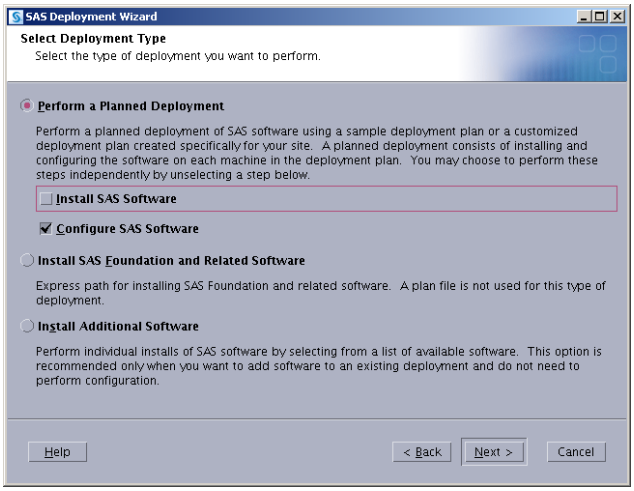
    For more detailed information, see the *SAS Deployment Wizard and SAS Deployment Manager 9.4: User's Guide*.

    If you executed SAS Deployment Wizard without specifying `-jobsubmit`, after SAS Deployment Wizard has completed successfully, run the series of jobs indicated in the JOBINDEX member of the `<HLQ>.INSTALL.CNTL` data set. After you submit the first job, each job submits the subsequent job as its last step.

    - You might want to edit each of the JOBCARDs in the jobs listed in the `JOBINDEX` member of the `<HLQ>.INSTALL.CNTL` data set to provide site-specific accounting information. You might also want to edit the user-defined fields in the JCL statements (such as UNIT values or SMS classes) to conform to standards at your site.
    - If you want to submit each job individually, edit the last step that submits the next job through the internal reader. Delete the IEBGENER step. Otherwise; submit ***only*** the first job.
    - A separate job named INSTHELP 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 choose to run this job, we recommend that it be run **after** the initial installation has completed.

    Note: *After submitting an installation job, the* `<HLQ>.INSTALL.CNTL` *library cannot be open in Edit mode. The job requires exclusive access (DISP=OLD) to the* `<HLQ>.INSTALL.CNTL` *library.*

12. If you did not select **Configure SAS Software** during the first 31-bit invocation, invoke SAS Deployment Wizard again. This time, select only **Configure SAS Software** as shown:



Proceed through the remainder of the configuration.

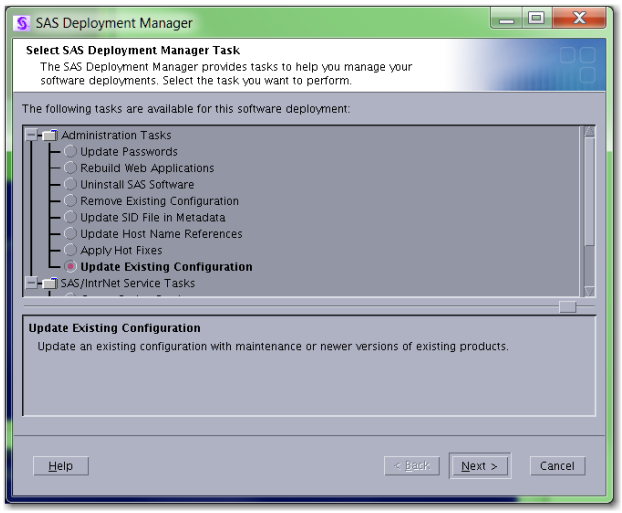
Note: *You should have defined ports, user IDs, servers, and more in your pre-installation checklist, which provides required information for the configuration dialogs.*

13. **Complete this step only if you are applying maintenance**. If you applied maintenance to an existing installation, you must invoke the SAS Deployment Manager to complete the update of your configuration. Make sure that all servers are stopped except for SAS Metadata Server, including the web applications.

    In OMVS, navigate using the "cd" command to `<SASHOME>/SASDeploymentManager/9.4` and invoke the following command:

    ```
    ./sasdm.rexx
    ```

    Then select "**Update Existing Configuration**" as shown:



Proceed through the remaining dialogs to complete your configuration.

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), then the SAS Deployment Wizard went into update mode and updated your installed SAS products to the most current level. If your order contained new SAS products, you must invoke SAS Deployment Wizard again to install those products, following the same instructions above starting with Step 3 under "Installation Steps."

Step 3. Validating Installation and Post-Configuration

After all installation jobs have finished, submit the VALID job in the `<HLQ>.INSTALL.CNTL` data set from the 31-bit installation 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.

Note: *Before copying a SAS installation to another system, contact SAS Technical Support.*

Step 4. Managing Server Sessions

After SAS Deployment Wizard has completed configuration of your software, any servers you have configured (Metadata Server, Object Spawner, OLAP Server) will be running as UNIX processes. To stop these processes cleanly, in OMVS navigate to your configuration directory, then the `Lev1` directory below that, and execute the following command:

```
./sas.servers stop
```

You can also issue this command:

```
./sas.servers status
```

to see the status of all servers (and which ones are running), or issue:

```
./sas.servers start
```

to start all servers in the correct order. If you want to run your servers as started tasks, for example, stop all the UNIX processes, then use the JCL created for the started tasks in the data set *<high-level-qualifier>*`.Wn.SRVPROC`.

Step 5. Installing SAS 9.4 Middle-Tier and Client Software from the SAS Software Depot

Creating the SAS Software Depot for Mid-Tier and Client Machines

To install software on your Middle-Tier and client machines, the SAS Software Depot must be accessible to those machines. If your machines can share directories, a single copy of the SAS Software Depot can be shared between machines, even on machines with different operating systems. You can use either of the following methods to create the depot:

- Download the SAS Download Manager for either UNIX or Windows from http://support.sas.com/downloadmgr. Follow the instructions to create the SAS Software Depot for each of your Middle-Tier and client machines.
- Copy your SAS Software Depot from z/OS to the other machines using a third-party FTP utility that can transfer entire directory trees in binary mode and preserve the case of all file names.

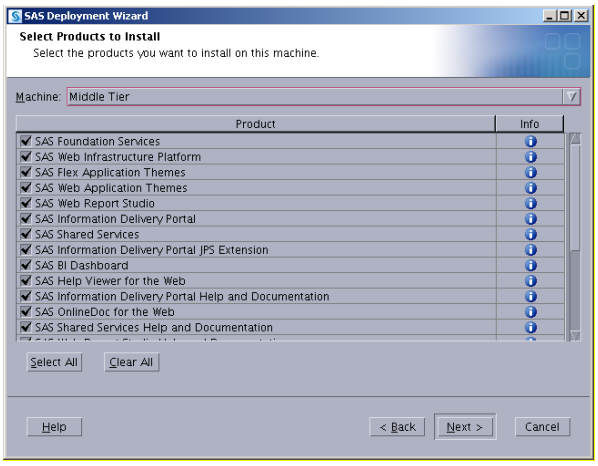
Installing Required Third-Party Software

Your checklist names any third-party software that must be installed before you install your SAS software. If you have no third-party software listed in the checklist or the ordersummary.html file, skip to "Installing SAS Software from the SAS Software Depot" on page 18.

The checklist indicates which third-party software must be obtained from its vendor. Obtain that software and install it according to the vendor's instructions.

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

Note: *Use the same plan that you used for the z/OS Server Tier. Select* ***Middle Tier*** *or* ***Clients*** *as appropriate.*



Installing SAS Software from the SAS Software Depot

The most commonly used options are as follows:

`-record` records the values that you specify for SAS Deployment Wizard prompts in the file specified by the `-responsefile` option. This is convenient when you must specify many options, such as port numbers, and you might have to rerun the configuration later. Note that once you have saved a response file, you can use it in a subsequent invocation of SAS Deployment Wizard by specifying `-responsefile` without the `-record` option.

`-responsefile` if `-record` is also specified, a new file is created with the responses entered in that invocation of SAS Deployment Wizard. If `-record` is not specified, an existing response file from a previous run will be used to fill in the responses from that previous run.

`-deploy` if you specify `-record` you must also specify `-deploy` to actually deploy the software.

`-console` only used for UNIX hosts, not needed on Windows.

Example

```
setup.exe -record -responsefile "C:\Program Files\SAS\sdwresponse.properties"
```

Notes:

- By default, no deployment occurs when running in record mode. In order to force a deployment while recording, use `-deploy`. For example (enter as one line):
  ```
  setup.exe -record -responsefile "C:\Program Files\SAS\
  sdwresponse.properties " -deploy
  ```
- If you specify a file location where a file already exists, the pre-existing file will be overwritten by the SAS Deployment Wizard.
- For more information about the choices available in each dialog, click the **Help** button. A full listing and description of these command-line options for `setup.exe` may be found in the *SAS Deployment Wizard and SAS Deployment Manager 9.4: User's Guide*.
- UNIX users should execute **`setup.sh`** from the root of your SAS Software Depot.

Step 6. 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 provides 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

`http://support.sas.com`

Technical Support SAS 9.4 Hot Fix downloads

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

General Information and Troubleshooting for Electronic Software Delivery

`http://support.sas.com/kb/30/950.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

Technical support is available to all customers who license SAS software. However, you are encouraged to engage your designated on-site SAS support personnel as your first support contact. If your on-site SAS support personnel cannot resolve your issue, they can contact SAS Technical Support to report your problem.

Before you contact SAS Technical Support, explore the SAS Support website at https://support.sas.com/en/technical-support.html. This site offers access to the SAS Knowledge Base, SAS communities, and other materials that might answer your questions.

When you contact SAS Technical Support, you are required to provide information, such as your SAS site number, company name, email address, and phone number, that identifies you as a licensed SAS software customer.

If you encounter problems with your installation, create a case at the Customer Service Portal: https://service.sas.com/csm.

SAS is the leader in business analytics software and services, and the largest independent vendor in the business intelligence market. Through innovative solutions, SAS helps customers at more than 70,000 sites improve performance and deliver value by making better decisions faster. Since 1976 SAS has been giving customers around the world THE POWER TO KNOW®.

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