SAS® 9.3 Intelligence Platform

Installation and Configuration Guide

SAS® 9.3 Intelligence Platform: Installation and Configuration Guide

Contents

What's New in Installation and Configuration for the SAS 9.3 Intelligence Platform

Overview

The *SAS Intelligence Platform: Installation and Configuration Guide* explains how to install and initially configure the SAS Intelligence Platform.

This document contains new material on the following enhancements and changes to the SAS Intelligence Platform deployment tools:

- SAS Download Manager no longer installed
- capability to subset SAS Software Depots
- SAS middle tier supported on 64-bit systems only
- z/OS deployment enhancements
- capability to build a middle-tier configuration for deployment on another machine
- enhanced support for locale and encoding
- new SAS uninstaller for Windows

The following enhancements and changes to the SAS Intelligence Platform deployment tools were made in the March 2012 release of SAS 9.3:

- new text-based interface for SAS Deployment tools
- SAS Download Manager Dependencies on Linux
- new depot checker utility

The following enhancements and changes to the SAS Intelligence Platform deployment tools were made in the second maintenance release for SAS 9.3:

- hot fixes now part of your initial SAS installation
- SAS hot fixes now installed using the deployment wizard
- new Web Infrastructure Database configuration options
- IPC timeout configuration option for WebSphere

SAS Download Manager No Longer Installed

For SAS 9.3, you no longer install the SAS Download Manager. You simply download and run it.

For more information, see "Create a Depot By Using the SAS Download Manager" on page 31.

Capability to Subset SAS Software Orders

Both the SAS Download Manager and the SAS Deployment Wizard enable you to subset—or break up—your software order. This enables you to create significantly smaller SAS Software Depots targeted for different sets of users based on operating system, product type, and language.

For more information, see "Subsetting SAS Software Orders" on page 44.

SAS Middle Tier Supported on 64-Bit Systems Only

The SAS 9.3 middle tier is supported only on 64-bit operating systems.

z/OS Deployment Enhancements

SAS 9.3 has enhanced the deployment experience for the z/OS platform through deployment wizard enhancements and a software depot mover tool.

For more information, see "Installing SAS on z/OS" on page 80 and Prerequisites for Creating a SAS Software Depot on page 80.

Capability to Build a Middle-Tier Configuration for Deployment on Another Machine

The SAS Deployment Wizard enables the SAS administrator to perform the SAS Web tier deployment on a machine that does not contain a Web application server. After the deployment is complete, the SAS administrator compresses the Web tier configuration and hands it off to his Web administrator counterpart to deploy on the target Web application server machine. For more information, see "Building a Web Application Server Configuration for Deployment on Another Machine" on page 65 and "Prerequisites for Creating a SAS Software Depot" on page 30.

Enhanced Support for Locale and Encoding

The SAS Deployment Wizard has enhanced support for configuring locales and encodings. For more information, see "Locale and Encoding Considerations" on page 82.

New SAS Uninstaller for Windows

SAS 9.3 has a new uninstaller on Windows that enables you to uninstall multiple SAS 9.3 applications in a single operation. For more information, see "Uninstall SAS on Windows" on page 211.

New Text-Based Interface for SAS Deployment Tools

In the March 2012 release of SAS 9.3, the SAS Deployment Wizard, SAS Deployment Manager, and SAS Download Manager can be run on operating systems that do not have windowing systems. For more information, see "Prerequisites for Creating a SAS Software Depot" on page 30.

SAS Download Manager Dependencies on Linux

In the March 2012 release of SAS 9.3, there are certain 64-bit Linux dependencies. For more information, see "Prerequisites for Creating a SAS Software Depot" on page 30.

New Depot Checker Utility

In the March 2012 release of SAS 9.3, SAS provides a utility with which you can verify the integrity of your SAS Software Depot. For more information, see "Checking Your SAS Software Depot" on page 57.

Hot Fixes Now Part of Your Initial SAS Installation

In the second maintenance release for SAS 9.3, the SAS Download Manager automatically downloads the necessary SAS hot fixes required by the SAS products in your initial order. This enhancement makes the following possible:

- Your SAS software is up-to-date with hot fixes deemed critical by SAS Technical Support after your initial deployment.

  You avoid the multi-step process of deploying software and then having to immediately update it with hot fixes. The SAS Deployment Wizard applies hot fixes prior to the configuration phase. You no longer have to reconfigure products immediately after their initial configuration.

- The SAS Deployment Wizard applies hot fixes prior to the configuration phase.

  You no longer have to reconfigure products immediately after their initial configuration.

- You can force the download manager to skip downloading any SAS hot fixes when downloading your SAS order. To do this, include the switch - - **-nohotfix** in the invocation line for the download manager. (Note that **-nohotfix** must be preceded by two hyphens. These two hyphens indicate to the self-exactracting script, that the **-nohotfix** switch is to be passed to the download manager.)

SAS Hot Fixes Now Installed Using the Deployment Wizard

In the second maintenance release for SAS 9.3, the SAS hot fix tool (sashf) has been deprecated. The SAS Deployment Wizard is now used to install SAS hot fixes.

For more information, see the SAS Deployment Wizard and SAS Deployment Manager User's Guide located at **http://support.sas.com/documentation/installcenter/en/ikdeploywizug/64204/PDF/default/user.pdf**.

New Web Infrastructure Database Configuration Options

In the second maintenance release for SAS 9.3, the SAS Deployment Wizard enables you to configure the catalog and schema pattern for the SAS Web Infrastructure Database. For more information, see "SAS Web Infrastructure Platform database properties" on page 114.

IPC Timeout Configuration Option for WebSphere

In the second maintenance release for SAS 9.3, there is now an IPC timeout configuration option for WebSphere managed servers. For more information, see "Web Application Server: Managed Server" on page 113.

Accessibility Features of the SAS Intelligence Platform Deployment Tools

Overview

The SAS 9.3 Intelligence Platform deployment tools have not been tested for compliance with U.S. Section 508 standards and W3C Web content accessibility guidelines. If you have specific questions about the accessibility of SAS products, send them to **accessibility@sas.com** or call SAS Technical Support.

Recommended Reading

Here is the recommended reading list for this title:

- *Installation Instructions for SAS 9.3 Electronic Software Delivery for Planning Installations on z/OS.*

- *Installation Instructions for SAS 9.3 Installation Kit for Planning Cartridge Installations on z/OS.*

- *Installation Instructions for SAS 9.3 Installation Kit for Planning DVD Installations on z/OS.*

- *SAS 9.3 Guide to Software Updates*.

- *SAS Deployment Wizard and SAS Deployment Manager 9.3: User's Guide* available at: **http://support.sas.com/documentation/installcenter/en/ikdeploywizug/64204/PDF/default/user.pdf**.

- *SAS Intelligence Platform: Data Administration Guide*.

- *SAS Intelligence Platform: Desktop Application Administration Guide*.

- *SAS Intelligence Platform: Middle-Tier Administration Guide*.

- *SAS Intelligence Platform: Overview*.

- *SAS Intelligence Platform: Security Administration Guide*.

- *SAS Intelligence Platform: System Administration Guide*.

- *SAS Intelligence Platform: Web Application Administration Guide*.

- SAS offers instructor-led training and self-paced e-learning courses to help you administer the SAS Intelligence Platform. For more information about the courses available, see support.sas.com/admintraining.

For a complete list of SAS books, go to support.sas.com/bookstore. If you have questions about which titles you need, please contact a SAS Book Sales Representative:

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Chapter 1

Introduction to Installing the SAS Intelligence Platform

What is the SAS Intelligence Platform?

The SAS Intelligence Platform is a comprehensive, end-to-end infrastructure for creating, managing, and distributing enterprise intelligence. The SAS Intelligence Platform comprises four software offerings:

- SAS BI Server

- SAS Enterprise BI Server

- SAS Data Integration Server

- SAS Enterprise Data Integration Server

Solutions for enterprise intelligence, customer intelligence, and financial intelligence are built on the Intelligence Platform, as well as turnkey solutions for specialized markets in life sciences, health care, retail, manufacturing, and others. Therefore, if your SAS deployment plan includes a SAS solution, then the SAS Intelligence Platform documentation also pertains to you.

The SAS Intelligence Platform library provides information for the four platform offerings, which include products and components such as the SAS Metadata Server, SAS Integration Technologies, and the SAS OLAP Server. See **http://support.sas.com/93administration** for more information about these four software offerings and their components.

What Is Covered in This Document?

This document begins where you and your SAS representative have decided what software that you need and on what machines you will install the software. At this point, you can begin performing some pre-installation tasks, such as creating operating system user accounts and designating the ports that you will use during installation.

This document covers all of the pre-installation, installation, and configuration tasks that you must perform to deploy the SAS Intelligence Platform on either a single machine or in a distributed, mixed operating system environment. By the time you reach the end of this document, all of your SAS servers, middle-tier servers, and clients will be functional.

Installing the software will be easier if you read the following documents as well:

- *SAS Intelligence Platform: Overview* to understand the architecture of the system.

- configuration documentation for SAS solutions. Many of the solutions leverage the functionality of the SAS Intelligence Platform. If your SAS deployment plan includes a solution, then you might also be referred to additional solution-specific configuration information.

Note: If you have licensed SAS solutions, consult with your SAS representative for more information.

Deploying the SAS Intelligence Platform

Overview of Deploying the SAS Intelligence Platform

The following list summarizes the steps required to install and configure the SAS Intelligence Platform on a single machine or in a distributed, heterogeneous environment. The first three steps are pre-installation tasks and can be performed in any order. Perform step 4 after steps 1 through 3 are completed:

Installing and configuring SAS is the fifth and final step in deploying SAS.

1. Review additional documentation.

2. Create operating system users and groups and designate ports.

3. Create a SAS Software Depot.

4. Install required third-party software.

5. Install and configure SAS.

The sections below provide a brief description of each of these tasks. Subsequent chapters in the guide provide the step-by-step instructions that you will need to perform them.

Step 1: Review Additional Documentation

It is very important to review all the different documents associated with deploying your SAS software. There can be late-breaking information, or instructions specific to a

particular configuration might be too narrow for inclusion in the *SAS Intelligence Platform: Installation and Configuration Guide*.

Your review should include these documents:

- QuickStart Guide

  This document is shipped with your SAS software. Follow its instructions.

  The QuickStart Guides are also available online:

  - Windows: **http://support.sas.com/documentation/ installcenter/93/win/index.html**

  - UNIX: **http://support.sas.com/documentation/ installcenter/93/unx/index.html**

  - z/OS: **http://support.sas.com/documentation/ installcenter/93/mvs/index.html**

- software order e-mail (SOE)

  This e-mail is sent to your site to announce the software and detail the order. It also enumerates the initial installation steps and, for SAS 9.3, contains instructions for using Electronic Software Delivery (ESD), if applicable. The SID file also contains your site's SAS license (SETINIT).

- SAS order information (SOI)

  After you download your order to an existing SAS Software Depot, you can use the SAS order information (SOI) file to determine what products were in your order and when the order was placed. The SOI is in your SAS Software Depot in **install_doc/***order-number***/soi.html**.

- SAS software summary

  In the same depot location as the SOI, the SAS software summary is a more detailed list of the software included in your order. Unlike the SAS order information sheet, which only lists the software that you have specifically ordered, this document also describes the included software that supports your order. The software summary is in your SAS Software Depot in **install_doc/***order- number***/ ordersummary.html**.

  Note: The SAS Deployment Wizard installs only what is listed in the deployment plan. The order summary might list more products than the deployment plan. For more information, see "About Deployment Plans" on page 79.

- system requirements

  Available at: **http://support.sas.com/resources/sysreq/index.html**

- SAS Notes

  Outstanding SAS Notes for alert status installation problems are available at:

  http://support.sas.com/notes/index.html

- *Installation Instructions for Release 5.2 of the SAS Performance Management Solutions*

  Available at these locations:

  - **http://support.sas.com/documentation/onlinedoc/fm**

  - **http://support.sas.com/documentation/onlinedoc/hcm**

  - **http://support.sas.com/documentation/onlinedoc/stm**

Step 2: Create Operating System Users and Groups and Designate Ports

Create a set of operating system users and groups that will be required during the installation and configuration of your system, and designate a set of ports to use.

For more information, see "Overview of Users, Groups, and Ports" on page 5.

Step 3: Create a SAS Software Depot

Create a SAS Software Depot, which enables you to install the SAS software over your site's network, rather than from the installation media.

Note: If you have elected to receive SAS through Electronic Software Delivery, a SAS Software Depot is automatically created for you.

For more information, see "Overview of SAS Software Depots" on page 25.

Step 4: Install Required Third-Party Software

Install any third-party products, such as a Java Development Kit and a Web application server, that are necessary for your installation. These products are identified in your deployment plan.

For more information, see "Overview of Installing Third-Party Products" on page 61.

Step 5: Install and Configure SAS

Having identified the proper deployment plan for your order, Install and configure your SAS software using the SAS Deployment Wizard, an installation and configuration tool that is supplied by SAS.

For more information, see "Overview of Installing and Configuring Your SAS Software" on page 78.

Chapter 2
Setting Up Users, Groups, and Ports

Overview of Users, Groups, and Ports

Before you begin installing and configuring your software, you must create a set of
required users and groups at the operating system level, and you must designate a set of

TCP/IP ports for the servers to use. This is the second of five tasks required to install and configure the SAS Intelligence Platform.

1. Review additional documentation.

⇨ **2. Create operating system users and groups and designate ports.**

3. Create a SAS Software Depot.

4. Install required third-party software.

5. Install and configure SAS.

Defining User Accounts

Overview of Defining User Accounts

There are two types of user accounts to understand when deploying SAS:

- *Internal user accounts* are accounts known only to SAS and are created and authenticated internally in metadata rather than externally.

- *External user accounts* are user accounts defined outside of SAS metadata. These accounts are local to a machine or are defined in a network directory service of which the machine is a member, such as LDAP.

The following sections describe the user accounts that SAS and third-party software require, and provide information to help you answer these questions:

- What are internal and external user accounts?

- What user rights or to what groups must each account be assigned?

- Should I create local or network directory service accounts?

- What password policies should I enforce?

This section contains the following topics:

Internal User Accounts

Internal user accounts are accounts known only to SAS and are created and authenticated internally in metadata rather than externally. SAS identifies internal accounts by appending a special string to the user ID. This string begins with an at sign (@) and contains *saspw*: `@saspw`. For two of the required user accounts, the SAS Administrator and the SAS Trusted User, the SAS Deployment Wizard prompts you by default to create *internal* user accounts.

The following table shows the default internal user accounts required by SAS. (SAS internal accounts are authenticated on the metadata server.)

Table 2.1   *SAS Internal User Accounts*

Description	User ID
SAS Administrator— The user account that has privileges associated with the SAS Metadata Unrestricted Users role.	sasadm@saspw
SAS Trusted User— The user account that can impersonate other users on connections to the metadata server. Some SAS processes use this account to communicate with the metadata server on a client's behalf.	sastrust@saspw

For more information about SAS internal user accounts and their purposes, see Chapter 2, "Understanding the State of Your System," in *SAS Intelligence Platform: System Administration Guide*.

Here are some benefits of internal accounts:

*   less maintenance.

    The account is defined only once in SAS, and you do *not* define this account externally using the authentication provider.

*   isolation from the host machine security policy.

    The SAS Administrator and the SAS Trusted User credentials are referenced in many locations within SAS. For example, forcing a recurring password change (a common security policy) might make unnecessary work for the person administering SAS.

*   independence from IT.

    You can create additional SAS unrestricted user and administrative user accounts for metadata management without involvement of your IT department.

*   reduced "headless" external user accounts.

    The SAS Trusted User is an account used for SAS inter-process communication, and it will not be mistaken for a human user.

*   minimal security exposure to your enterprise.

    The SAS Administrator and the SAS Trusted User are highly privileged accounts and only provide access to SAS—not to operating system resources.

Required External User Accounts for SAS

External user accounts are user accounts defined outside of SAS metadata. These accounts are local to a machine or are defined in a network directory service of which the machine is a member, such as LDAP. SAS requires certain *external* user accounts for two purposes: installation and running certain SAS server processes.

During installation and configuration, the SAS Deployment Wizard must run under an external account with the necessary privileges on the target machine to write SAS program and log files. To run servers such as the stored process server and the pooled workspace server, SAS requires an external user account to be the server process owner. For more information about external user accounts and their purposes, see the *SAS Intelligence Platform: System Administration Guide*.

As you set up external accounts, remember to use different external accounts for the SAS First User and the SAS Spawned Servers user. Otherwise, your configuration will end in errors and the SAS pooled workspace server will not be functional.

As you create these external user accounts, record information about them in "Pre-installation Checklist for External User Accounts for SAS on Windows and UNIX" on page 12 or in "Pre-installation Checklist for External User Accounts for SAS on z/OS" on page 13 . You will need this information when you run the SAS Deployment Wizard later.

Note: To validate your SAS deployment, you will need an external user account that is representative of a SAS client user, such as a user of SAS Data Integration Studio, that must be the temporary process owner when its jobs are run on a standard workspace server. If Integrated Windows authentication (IWA) is *not* being implemented, it can be helpful to have the SAS Deployment Wizard create a SAS First User account (sasdemo) in metadata during deployment for validation purposes. The wizard will also assign the required `Log on as a batch job` Windows user right for you.

The following table shows external user accounts required by SAS and the machines on which they are authenticated.

Table 2.2   Required External User Accounts for SAS

Description	Recommended User ID	Machine Where Authenticated
SAS Installer— The account used to install SAS.	sas	Every machine
SAS Spawned Servers account— The process owner for stored process servers and pooled workspace servers.	sassrv	Stored process server Pooled workspace server

Note:

- For information about the user rights that each external account requires, see "Rights Required by External User Accounts for SAS" on page 9.

- UNIX: the SAS Installer generally overrides the default configuration directory with the site's preferred location (for example, `/opt/sas/config`). The installer must have Write permission on this path.

- Windows: The SAS Installer user ID must be available in the long term for future SAS maintenance.

- UNIX: Do not use root for the SAS Installer user ID.

- AIX: For both user IDs, make sure that the `User can LOGIN?` setting is set to `true`.

- z/OS: The SAS Installer and the SAS Spawned Servers account must have a TSO segment defined.

- z/OS: By default, the SAS Installer:

- is the started task owner for the servers.

- is the owner of the configuration directory structure.

- must have a writable home directory in the UNIX file system.

- must have an OMVS segment definition with the following settings:

  - CPUTIMEMAX of at least 5000 seconds

  - PROCUSERMAX of at least 50 users

  - ASSIZEMAX of 1073741824 bytes

    or, ASSIZEMAX of between 1.5 GB - 2GB-1 if running SAS IT Resource Management or the SAS Migration Utility

Rights Required by External User Accounts for SAS

Operating systems require that you assign certain rights to the external user accounts used to deploy and to run SAS.

The following table describes the user rights needed by the required external user accounts to deploy and run SAS.

Table 2.3   *Rights Required by External User Accounts for SAS*

External User Account	Operating System	User Rights Needed
SAS Installer	Windows	Administrator rights
	UNIX	The group that you designate as the *primary* group for the SAS Installer must contain the SAS Spawned Servers account.
	z/OS	The group that you designate as the *primary* group for the SAS Installer must contain the SAS Spawned Servers account.

External User Account	Operating System	User Rights Needed
SAS Spawned Servers account	Windows*	`Log on as a batch job`
	UNIX	Member of a group that is the *primary* group for the SAS Installer.
		(This group does *not* have to be the primary group for the SAS Spawned Servers account.)
	z/OS	Member of a group that is the *primary* group for the SAS Installer.
		(This group does *not* have to be the primary group for the SAS Spawned Servers account.)

* The SAS Deployment Wizard automatically assigns the Windows user right **Log on as a batch job** to the SAS Spawned Servers account.

On Windows, if you choose how to run your SAS servers using management scripts—instead of running them as Windows services—then the user account that runs the object spawner must meet the following requirements on the object spawner machine:

- be the administrator or a member of the Windows Administrator's group

- have the following Windows local user rights:

  - `Adjust memory quotas for a process`

  - `Replace a process level token`

Required External User Accounts for Third-Party Software

The following table describes the external user accounts required by third-party software and the machines on which they are authenticated—either as local accounts or in a network directory service that the machine can access.

Table 2.4   Required External User Accounts for Third-Party Software

Description	Recommended User ID	Machine Where Authenticated
LSF Administrator— Process owner for Platform LSF services and daemons. Required if you install Platform Suite for SAS to support scheduling or grid computing. Also owns the LSF configuration and log files and has permission to perform cluster-wide operations, edit configuration files, and reconfigure a cluster.	lsfadmin	Every Platform Process Manager and Platform LSF machine
LSF User— Sometimes referred to as the scheduling user. Required by SAS Web Report Studio to run the Output Generation Tool, which creates scheduled reports in batch mode.	lsfuser	Platform Process Manager

As you create these external user accounts, record information about them in "Pre-installation Checklist for External User Accounts for SAS on Windows and UNIX" on page 12. You will need this information when you run the SAS Deployment Wizard (in Chapter 6).

Note: For information about the user rights that each account requires, see "Rights Required by External User Accounts for Third-Party Software" on page 11.

Rights Required by External User Accounts for Third-Party Software

The following table describes the user rights needed by the required external user accounts to deploy and run third-party software:

Table 2.5   *Rights Required by External User Accounts for Third-Party Software*

External User Account	Operating System	User Rights Needed

LSF Administrator	Windows	Administrator rights
		
		`Adjust memory quotas for a process`
		
		`Debug programs`
		
		`Log on as a service`
		
		`Replace a process level token`

LSF User	Windows	`Log on as a batch job` or `Log on locally`

Local or Directory Service Accounts?

SAS relies on its various server machines to authenticate external user accounts. In turn, the SAS server machine authenticates user accounts using an authentication provider. An *authentication provider* refers to an authentication service that is one of the following:

- local to a machine and used to authenticate local host user accounts

- available to a machine through a computer network and used to authenticate directory service accounts such as LDAP or Active Directory

You can create either local or directory service accounts for external users. The only requirement is that each user shown in Table 2.2 on page 8 can be authenticated by the machine's authentication provider—be that an authentication provider that is local to the machine, or an authentication provider that is available to the machine through a directory service.

The main advantage of local accounts is that if account information were to get into the wrong hands, the credentials could be used only to log on to the machine or machines that can authenticate the credentials. A secondary benefit is that the host could continue to authenticate users even if the directory service authentication provider were unavailable.

The advantage of directory service accounts is that you do not have to create the same accounts on multiple machines or keep the account information synchronized across machines—the directory service authentication provider does this for you.

For example, setting up the SAS Spawned Server user account is usually straightforward. The spawned server account must be able to be authenticated by the pooled workspace server and stored process server machine. If these servers are distributed on more than one machine, then each machine must be a member of the same directory service or in different directory services between which a trust has been established.

Password Policies

Note: In this section, we are talking only about the passwords for the few external user accounts SAS requires, not the passwords for regular users of the system.

When you set up passwords for your SAS system accounts, we *highly recommend* that these passwords do not have to be reset when a user first logs on. If, for some reason, it is required that you create passwords that have to be reset, you will have to log on using each account and change the password before you install and configure your software. And, of course, you will need to know the changed password for each account.

By default, passwords for internal accounts are set not to expire. When passwords for system accounts change, you must use the SAS Deployment Manager to update a set of configuration files and some metadata objects. SAS provides instructions for updating these files and metadata objects. However, you can save yourself some time if the passwords do not expire. For more information see "Update a Managed Password" in Chapter 4 of *SAS Intelligence Platform: Security Administration Guide.*.

Pre-installation Checklist for External User Accounts for SAS on Windows and UNIX

Use the following pre-installation checklist to create the necessary external user accounts to deploy and run SAS on Windows and UNIX.

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at **http://support.sas.com/installcenter/plans**. This Web site also contains a corresponding deployment plan and an architectural diagram.

Table 2.6   *Pre-installation Checklist for External User Accounts for SAS on Windows and UNIX*

Account	Recommended User ID	Actual User ID
SAS Installer	Windows: *my-domain\installer-ID*[*] UNIX: sas[**], [***]	
SAS Spawned Servers account	Windows: *my-domain\sassrv* UNIX: sassrv[**]	

  [*] On Windows, the user ID should be available in the long term for future SAS maintenance.

 [**] On AIX, make sure that the **User can LOGIN?** setting is set to **true** for the user.

[***] On UNIX, do not use root.

Note these important items:

- For information about the user rights that each external account requires, see "Rights Required by External User Accounts for SAS" on page 9.

- The SAS Deployment Wizard prompts you for the Installer account and the SAS Spawned Servers account information, and you cannot complete the installation without supplying it.

- On UNIX systems prior to configuration, the SAS Deployment Wizard prompts you for the root (or sudo) password. Certain SAS products and features use functionality that requires SAS to check user ID authentication and file access authorizations. This in turn necessitates that certain files within your SAS installation have setuid permissions and be owned by root.

- If your UNIX system uses an authentication method other than **/etc/passwd** or **/etc/shadow**, then you must configure authentication before you begin your SAS software deployment, or SAS 9.3 will not function properly. For more information, see the *Configuration Guide for SAS 9.3 Foundation for UNIX Environments* available at: **http://support.sas.com/documentation/ installcenter/en/ikfdtnunxcg/64205/PDF/default/config.pdf**.

Pre-installation Checklist for External User Accounts for Third-Party Software

Use the following pre-installation checklist to create the necessary external user accounts to deploy and run third-party software.

Note: The SAS Deployment Wizard prompts you for this information, and you cannot complete the installation without it.

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at **http://support.sas.com/installcenter/plans**. This Web site also contains a corresponding deployment plan and an architectural diagram.

Table 2.7   *Pre-installation Checklist for External User Accounts (Third Party)*

Account	Recommended User ID	Actual User ID
LSF Administrator	Windows: *my-domain*\lsfadmin UNIX: lsfadmin	
LSF User	Windows: *my-domain*\lsfuser UNIX: lsfuser	

Note: For information about the user rights that each account requires, see "Rights Required by External User Accounts for Third-Party Software" on page 11.

Pre-installation Checklist for External User Accounts for SAS on z/OS

Use the following pre-installation checklist to create the necessary external user accounts to deploy and run SAS on z/OS.

Note: The SAS Deployment Wizard prompts you for this information, and you cannot complete the installation without it.

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at **http://support.sas.com/installcenter/plans**. This Web site also contains a corresponding deployment plan and an architectural diagram.

Table 2.8 *Pre-installation Checklist for External User Accounts for SAS on z/OS*

Account	Recommended User ID	Actual User ID
SAS Installer	sas	
SAS Spawned Servers account	sassrv	

Note:

- For information about the user rights that each external account requires, see "Rights Required by External User Accounts for SAS" on page 9.

- The SAS Installer and the SAS Spawned Servers account must have a TSO segment defined.

- By default, the SAS Installer:

- is the started task owner for the servers.

- is the owner of the configuration directory structure.

- must have a writable home directory in the UNIX file system.

- must have an OMVS segment definition with the following settings:

  - CPUTIMEMAX of at least 5000 seconds

  - PROCUSERMAX of at least 50 users

  - ASSIZEMAX of 1073741824 bytes

    or, ASSIZEMAX of between 1.5 GB - 2GB-1 if running SAS IT Resource Management or the SAS Migration Utility

Defining Groups

Overview of Defining Groups

On UNIX, adding users to a group is required to assign the necessary operating system privileges to deploy and run SAS. Using a group is one method for granting the corresponding user rights needed on Windows.

This section contains the following topics:

- "The SAS Server Users Group (Windows)" on page 15

- "The sas Group (UNIX) " on page 15

- "The SASGRP Group (z/OS) " on page 16

- "Pre-installation Checklist for Groups for SAS on Windows and UNIX" on page 16

The SAS Server Users Group (Windows)

To deploy SAS on Windows, the user must have certain local user rights on the machine hosting the server. These rights are required before the user can start a process for a stored process server, a pooled workspace server, or a standard workspace server. One suggestion for giving a user these rights is to create a group, add users to the group, and then assign the rights to the group. (The scheduling user, lsfuser—which is required if you are scheduling reports—also must have this same right.)

Note: Not all of these user accounts will exist in every installation. You add only those that you have created. In addition, if you are working in a multi-machine environment and are using local groups, not all of the users that you have created need to be included in every local group. You need only include the users who will be authenticated by a stored process server, pooled workspace server, or standard workspace server on a given machine. On some machines (for example, a machine hosting middle-tier components) there might be no need for the group at all.

To set up a group, complete these steps:

1. Create a SAS server users group. This can be a local group or a group with domain scope.

2. Add the following users to the group:

   - SAS Spawned Servers account

   - SAS First User (optional account)

   - LSF User

   - any other external users that need to access a standard workspace server

   Note: The SAS Deployment Wizard automatically grants the Windows user right `Log on as a batch job` to the SAS Spawned Servers account. If you choose to have the wizard create the optional SAS First User account in metadata, the wizard also automatically grants the `Log on as a batch job` Windows user right to this First User account. If Integrated Windows authentication (IWA) is implemented, this user right is not required for the SAS First User and other regular SAS users who access standard workspace servers, such as SAS Data Integration Studio or SAS Enterprise Guide users.

3. Finally, grant the user right `Log on as a batch job` to the group. For information about setting local user rights, see your Microsoft Windows documentation. If the users in the group need that right on more than one Windows machine, the right needs to be assigned specifically on each machine.

The sas Group (UNIX)

To deploy SAS on UNIX, you should create an operating system group and make this the *primary* group for the UNIX SAS Installer user. The SAS Spawned Servers account should also be made a member of the sas group. (Members of this group will be given access to certain directories and files created by the SAS Deployment Wizard.)

For information about creating groups and adding user accounts, see your UNIX documentation.

The SASGRP Group (z/OS)

To deploy SAS on z/OS, you should create a RACF group named SASGRP. This group is used to control access to directories and files in the configuration directory created in the HFS file system. The definition of this RACF group must include an OMVS segment and must be set as the default group for the SAS Installer and the SAS Spawned Servers account.

For information about creating groups and adding user accounts, see your IBM z/OS documentation.

Pre-installation Checklist for Groups for SAS on Windows and UNIX

Use the following pre-installation checklist to make sure that you have created the necessary groups to deploy and run SAS on Windows and UNIX:

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at **http://support.sas.com/installcenter/plans**. This Web site also contains a corresponding deployment plan and an architectural diagram.

Table 2.9 *Pre-installation Checklist for Groups for SAS on Windows and UNIX*

Recommended Group Name	Group Members	Operating System and Purpose	Actual Group Name
SAS Server Users[*]	SAS Spawned Servers account	Windows— Suggested method for assigning the **Log on as a batch job** user right to the SAS Spawned Servers account for the stored process server and pooled workspace server.	
	SAS First User Any other users	Suggested method for assigning the **Log on as a batch job** user right to the SAS First User and any other standard workspace server users.	
sas[**]	SAS Installer	UNIX— Primary group for the SAS Installer user. Enables the SAS Deployment Wizard to create the necessary log and configuration directories required by SAS.	
	SAS Spawned Servers account	Through group membership, grants Write permissions to the SAS Spawned Server account for modifying specific SAS log and configuration directories.	

[*] Unless Integrated Windows authentication (IWA) is implemented, add any other any external users accessing standard workspace servers.

[**] Limit membership because this privileged group has operating system access to certain configuration files.

Pre-installation Checklist for Groups for Third-Party Software

Use the following pre-installation checklist to create the necessary groups to deploy and run third-party software.

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at **http://support.sas.com/installcenter/plans**. This Web site also contains a corresponding deployment plan and an architectural diagram.

Table 2.10 *Pre-installation Checklist for Groups for Third-Party Software*

Recommended Group Name	Group Members	Operating System and Purpose	Actual Group Name
SAS Server Users	Scheduling user (lsfuser)	Windows— Suggested method for assigning the **Log on as a batch job** user right to scheduling users.	
sas	SAS Installer (sas) WebSphere Application Server Installer	UNIX— Suggested method for assigning required permissions to write to certain installation directories.	
SASGRP	SAS Installer (sas) WebSphere Application Server Installer	z/OS— Suggested method for assigning required permissions to write to certain installation directories.	

Pre-installation Checklist for Groups for SAS on z/OS

Use the following pre-installation checklist to create the necessary groups to deploy and run SAS on z/OS:

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at **http://support.sas.com/installcenter/plans**. This Web site also contains a corresponding deployment plan and an architectural diagram.

Table 2.11 *Pre-installation Checklist for Groups for SAS on z/OS*

Recommended Group Name	Group Members	Purpose(s)	Actual Group Name
SASGRP[*]	SAS Installer	Default group for the SAS Installer user.	

Recommended Group Name	Group Members	Purpose(s)	Actual Group Name
	SAS Spawned Servers account	Through group membership, grants Write permissions to the SAS Spawned Server account for modifying SAS log and configuration directories.	

* The definition of this RACF group must include an OMVS segment. Limit membership because this privileged group has operating system access to certain configuration files.

Additional z/OS Pre-Installation Tasks

About Additional z/OS Pre-Installation Tasks

In addition to creating the necessary users, groups, and ports, to deploy the SAS Intelligence Platform on z/OS, you must also do the following:

Create a Configuration Directory and Define the SAS Library on z/OS

In addition to creating the necessary users, groups, and ports, to deploy the SAS Intelligence Platform on z/OS, you must also do the following:

- Create a directory that will serve as the configuration directory for the SAS server tier on the z/OS machine.

- Define the SAS executable library to be program-controlled.

Record this information in the following checklist:

Table 2.12   Configuration Directory and SAS Executable Library Checklist on z/OS

Task	Actual Directory or Library Name
Create a configuration directory* for the SAS server tier	
Define the SAS executable library to be program-controlled	

* A typical path is **/usr/lpp/SAS/SAS_9.3**/*config-directory*.

Install the SAS 9.3 SVC Routine

In addition to creating the necessary users, groups, and ports, to deploy the SAS Intelligence Platform on z/OS, you must also install the SAS 9.3 SVC routine. To install the SAS 9.3 SVC routine, follow these steps:

1. Download the instsvc.xmit file from the SAS FTP Web site at **ftp:// ftp.sas.com/techsup/download/mvs**.

2. Using FTP, transfer the instsvc.xmit file (in binary mode) to your z/OS system. You should preallocate the target data set with the following DCB characteristics:

   LRECL=80

   BLKSIZE=3120

   RECFM=FB

3. Use the following RECEIVE command to create a PDS that will contain the JCL members that are required to install the SVC routine, where sas93.instsvc.xmit is the name of the file to which you transferred the instsvc.xmit file, using FTP.

   ```
   receive indataset(sas93.instsvc.xmit)
   ```

   Respond with the name of a data set that will contain the JCL members (that you will use to complete the installation) by issuing the following command:

   ```
   da(sas93.instsvc.cntl)
   ```

4. Create the library that will contain the load modules by issuing the following command, where SAS93.INSTSVC.CNTL is the data set that you created in the previous step:

   ```
   receive indataset(sas93.instsvc.cntl(svcmod))
   ```

5. Respond with the name of a data set that will contain the load modules by issuing the following command:

   ```
   da(sas93.instsvc.library)
   ```

6. Continue your SVC installation by following the instructions in "Installing the SAS 9.3 SVC Routine" in the *Configuration Guide for SAS 9.3 Foundation for z/OS* available at: **http://support.sas.com/documentation/ installcenter/en/ikfdtnmvscg/64313/PDF/default/config.pdf**, with the following exceptions:

   • Anywhere that the documentation references the BAMISC data set, use the CNTL data set that you created in step 3.

   • Anywhere that the documentation refers to the SAS.LIBRARY data set, use the data set that you created in step 4.

Install the SASCP Module

In addition to creating the necessary users, groups, and ports, to deploy the SAS Intelligence Platform on z/OS, you must also install the SAS 9.3 SASCP module. To install the SAS 9.3 SASCP module, follow these steps:

1. Download the instsascp.xmit file from the SAS FTP Web site at **ftp:// ftp.sas.com/techsup/download/mvs**.

2. Using FTP, transfer the instsascp.xmit file (in binary mode) to your z/OS system.

   You should preallocate the target data set with the following DCB characteristics:

   LRECL=80

   BLKSIZE=3120

   RECFM=FB

3. Use the following RECEIVE command to create a PDS that will contain the SASCP load module, where sas93.insascp.xmit is the name of the file to which you transferred the instsascp.xmit file, using FTP.

   ```
   receive indataset(sas93.insascp.xmit)
   ```

   Respond with the name of the target data set to contain the SASCP load module by issuing the following command:

   ```
   da(sas93.insascp.load)
   ```

4. Copy the SASCP module to a load library that contains TSO commands.

   This can be a STEPLIB library defined in a LOGON procedure, a system link list library, or a link pack area library.

   For more information about the SASCP module see "Implementing SAS TSO Support" in the *Configuration Guide for SAS 9.3 Foundation for z/OS* available at: **http://support.sas.com/documentation/installcenter/en/ ikfdtnmvscg/64313/PDF/default/config.pdf**.

Designating Ports and Multicast Addresses

About Ports and Multicast Addresses

While you are creating operating system user accounts and groups, you need to review the set of ports that the SAS servers, third-party servers, and spawners in your system will use by default. If any of these ports is unavailable, select an alternate port, and record the new port on the following ports pre-installation checklists:

- "Multicast Address Considerations" on page 20
- "How the Deployment Wizard Assigns Ports" on page 22
- "Pre-installation Checklist for Ports for SAS" on page 22

For third-party software ports, see "Pre-installation Checklists for Third-Party Products" on page 71.

You also need to plan for designating Internet Protocol (IP) multicast addresses for the all the machines in your SAS deployment. Multicasting simplifies the on-going management and deployment of SAS Web applications, by providing the flexibility to customize the SAS middle-tier, and to distribute SAS Web components to implement load balancing.

Multicast Address Considerations

The SAS Deployment Wizard prompts you to supply a multicast address for inter-machine communication. The wizard supplies you with a default multicast address that it

generates based on the machine's IP address and the admin local scope that is recommended in RFC 3171 (IPv4) or RFC 4291 (IPv6).

A multicast group communications protocol is used to communicate among middle-tier SAS applications in a single SAS deployment (the set of applications connected to the same SAS Metadata Server). The combination of multicast IP address and multicast UDP port should be different for each SAS deployment and also different from those used by other multicast applications at your site.

The multicast group communication includes all information needed to bootstrap SAS middle-tier applications. Because this includes sending the SAS environment credentials (such as the sasadm account name and its password), scoping and encryption options are provided. The defaults are most appropriate for deployments in a firewall, isolated data center environment.

The IP multicast address must be valid for IP multicasting and should be in the range 224.0.0.0 to 239.255.255.255 for IPv4 or have the prefix ff00::/8 for IPv6. Typically, the chosen address will be in the admin-local scoped block which corresponds to 239/8 for IPv4 and ff14::/8 for IPv6. The sample address provided during configuration by the SAS Deployment Wizard conforms to these standards. The address should be unique to SAS applications for the subnet that they are installed on.

The IP Multicast UDP port should be open and usable on any machine a middle-tier application is to be installed. This is a UDP port and does not conflict with any previous TCP port definitions such as the metadata server. The multicast group communication is intended to be used only within your data center environment. Many sites keep their data center network separated from end users via a firewall that will automatically isolate the multicast protocol. Alternatively, the time to live (TTL) parameter can be used to restrict the scope of multicast communication. Your network administrator can suggest a TTL setting to limit the scope of the multicast. The TTL option and the authentication token option both have security implications.

The multicast TTL property (default = 1, range = 0–255) affects the number of network hops a multicast packet will take before being dropped. This TTL value must be greater than or equal to the largest number of hops between any two servers containing SAS products. In addition, some network router documentation recommends that multicast datagrams with initial TTL=0 are restricted to the same host, multicast datagrams with initial TTL=1 are restricted to the same subnet, and multicast datagrams with initial TTL=32 are restricted to the same site. Consult your network router documentation or your network administration staff to determine the correct values for your environment.

Note: You must make sure that all of the machines in your SAS 9.3 deployment are members of the same subnet, or be sure to set the default TTL value to a number higher than 1. The deployment wizard gives you the opportunity to set the TTL value during SAS 9.3 deployment. For information about how to change these options after deployment, see Chapter 13, "Administering Multicast Options," in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Because the multicast protocol conveys credentials, it is protected via encryption. By default, group communication is protected only with a fixed encryption key that is built into the software. If your middle-tier is not running in an environment that is well-isolated from end-user access, then you might want better protection against eavesdroppers and unauthorized group participants. For such situations, choose a multicast authentication token known only to your SAS middle-tier administrative staff. The authentication token is a password-like string needed to connect to the group and create a site-specific encryption key.

The deployment wizard default simplifies configuration using the authentication token that is built into the software. This option is best used in development and other low-security environments. It might also be appropriate in higher-security environments where the multicast group communication is isolated from the end-user community, either via firewall or TTL option, and where all data center administrative and operations staff have sufficient security approval.

If your multicast group communication is not contained within an isolated data center environment, or if the security procedures at your site require protections among administrative and operational staff in various roles, you should specify an authentication token that is known only to the administrators of the SAS environment. The same token string must be supplied on each tier in the configuration.

By default, there is a code level authentication token shared between all SAS middle-tier applications to prevent access to the multicast group from unauthorized listeners. If you choose to use a customized authentication token, use the deployment wizard to enter an authentication token value that meets your organization's security guidelines. The authentication token can be any password-like string. In a multi-tier configuration, this prompt appears on each tier that has an application participating in the SAS multicast groups. You must provide the same authentication token string to each tier in the same SAS deployment (that is, each tier associated with the same metadata server).

For more information about configuring Web application servers to use with SAS 9.3, go to the Third-Party Software Downloads site at **http://support.sas.com/resources/thirdpartysupport/v93/index.html** and search for the product name of your Web application server.

How the Deployment Wizard Assigns Ports

Table 2.13 on page 23 lists a port range for each SAS server (or spawner). When assigning default ports, the deployment wizard looks for the next available port in the range. Typically, on all operating systems, the last digit of the default port number reflects the configuration level that you select in the SAS Deployment Wizard. For example, when you select **Lev1**, the default port for the metadata server is 8561. If you choose another level, such as **Lev2**, the wizard changes the default port to 8562.

In some rare situations, some ports might end with a different digit. This is because the default port is already in use.

On UNIX and z/OS, we recommend that you document each SAS port that you reserve in the following standard locations on each machine:

- UNIX—**/etc/services**
- z/OS—your TCP/IP PROFILE data set

This practice will help avoid port conflicts on the affected machines.

On z/OS, the SAS servers are configured and initially started as TSO processes invoked from the USS shell using **/bin/tso**. When these servers are started under TSO, the job name consists of the user ID that is starting the server, with a character appended to the end. If your site makes use of the reserved ports facility in TCP/IP, each port definition should include the started task and this SAS installer ID job name as valid users of this port. You can use an asterisk (such as sas*) in this definition.

Pre-installation Checklist for Ports for SAS

The following checklist indicates what ports are used for SAS by default, and gives you a place to enter the port numbers that you will actually use.

Note: The SAS Deployment Wizard prompts you for this information, and you cannot complete the installation without it.

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at **http://support.sas.com/installcenter/plans**. This Web site also contains a corresponding deployment plan and an architectural diagram. If you are a SAS solutions customer, consult the pre-installation checklist provided by your SAS representative for a complete list of ports that you must designate.

Table 2.13 *Pre-installation Checklist for Ports (SAS)*

Server or Spawner	Default Port	Data Direction	Actual Port
E-mail server	25	Outbound	
HTTP server	80	Inbound and outbound	
HTTP server (secure port)	443	Inbound and outbound	
SAS Remote Services application	5090 – 5099	Inbound	
SAS OLAP Server	5450 – 5459	Inbound	
Event Broker administration	6051 – 6059	Inbound	
SAS/CONNECT server and spawner	7550 – 7559	Inbound and outbound	
Web Report Studio IP Scheduling UDP Ports (1–3)	7570 – 7599	Inbound and outbound	
Event Broker HTTP	8110 – 8119	Inbound	
Operating System Services scheduler	8450 – 8459	Inbound	
SAS/SHARE server	8550 – 8559	Inbound	
Multicast (UDP port)	8560 – 8569	Inbound and outbound	
SAS Metadata Server	8560 – 8569	Inbound	
SAS object spawner: operator port	8580 – 8589	Inbound	
SAS Workspace Server	8590 – 8599	Inbound	
Metadata utilities SAS Workspace Server[*]	8590 – 8599	Inbound	

Server or Spawner	Default Port	Data Direction	Actual Port
SAS Stored Process Server: bridge connection	8600 – 8609	Inbound	
SAS Stored Process Server: load balancing connection 1 (MultiBridge)	8610 – 8619	Inbound	
SAS Stored Process Server: load balancing connection 2 (MultiBridge)	8620 – 8629	Inbound	
SAS Stored Process Server: load balancing connection 3 (MultiBridge)	8630 – 8639	Inbound	
SAS Pooled Workspace Server	8700 – 8709	Inbound	
SAS object spawner: pooled workspace server port bank 1	8800 – 8809	Inbound	
SAS object spawner: pooled workspace server port bank 2	8810 – 8819	Inbound	
SAS object spawner: pooled workspace server port bank 3	8820 – 8829	Inbound	
SAS Deployment Tester server	10020 – 10029	Inbound	
SAS Information Retrieval Studio	10650 – 10659	Inbound	
SAS Framework Data Server	22030 – 22039	Inbound	

* In SAS 9.3, two or more workspace servers can share the same port even if they are running at the same time.

Chapter 3
Creating a SAS Software Depot

Overview of SAS Software Depots

One prerequisite for deploying SAS is to create a special file system of SAS product and order data—a SAS Software Depot—that the SAS Deployment Wizard then uses to install and configure SAS.

Creating a SAS Software Depot is the third of five steps required to install and configure the SAS Intelligence Platform:

1. Review additional documentation.

2. Create operating system users and groups and designate ports.

⇨ **3. Create a SAS Software Depot.**

4. Install required third-party software.

5. Install and configure SAS.

About SAS Software Depots

A *SAS Software Depot* is a file system that consists of a collection of SAS installation files that represents one or more orders. The 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 depot contains the SAS Deployment Wizard executable, one or more deployment plans, a SAS installation data file per order, order data, and product data.

Figure 3.1 *SAS Software Depot File Structure*
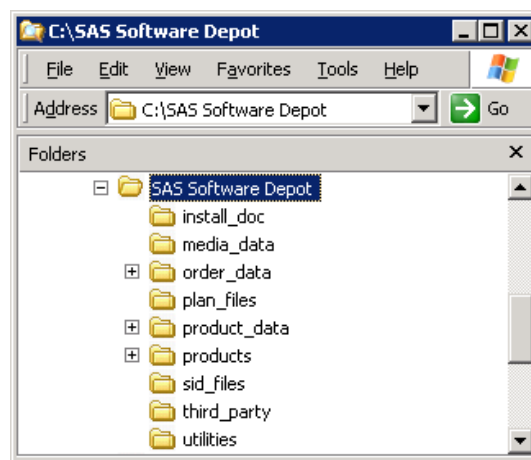
Before you can install SAS, you must first have a software depot to install from. During a SAS software download, the SAS Download Manager downloads your order, verifies it, and automatically creates a SAS Software Depot. If you receive your SAS order in the form of physical media, then you create a depot using the SAS Deployment Wizard.

Figure 3.2 *Methods for SAS Software Depot Creation*
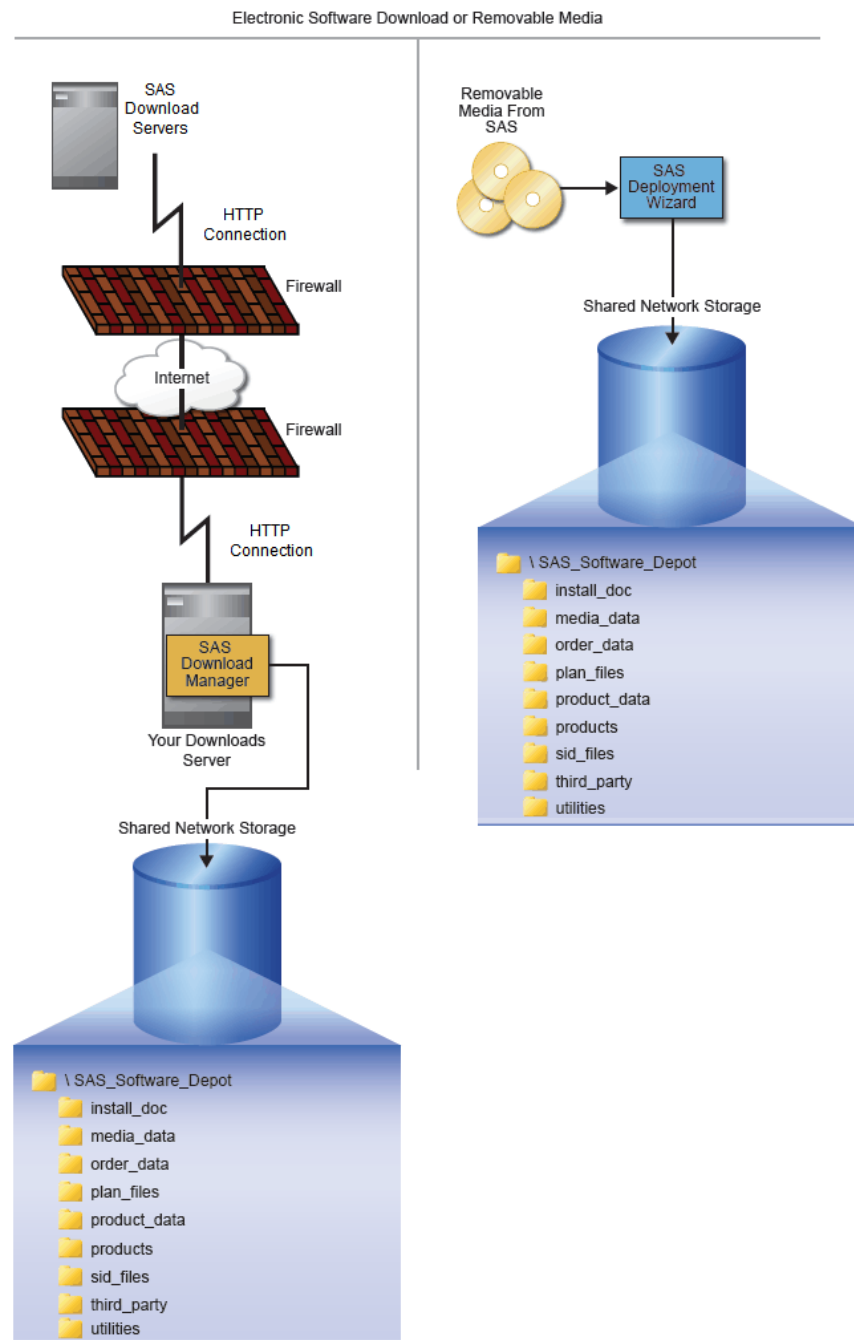
Benefits of a SAS Software Depot

The main advantage of a SAS Software Depot is realized when it resides on the network at a location that you can share access to. When it is shared, a depot provides a faster and more reliable means of installation compared to traditional removable media (cartridges, CDs, DVDs, and so on).

Figure 3.3 *Shared SAS Software Depot Model*
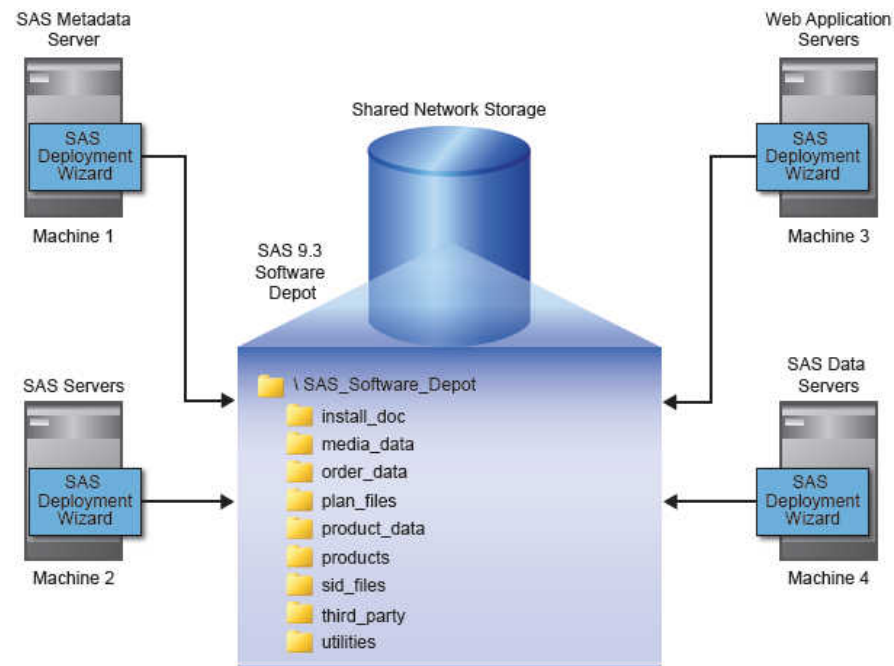
If you have remote sites running SAS without access to the network on which your depot resides, you can use the SAS Deployment Wizard to create your own SAS media image to write to the removable media of your choice.

Here are some other benefits of using a SAS Software Depot:

- centralizes SAS orders.

  The depot enables you to place multiple SAS orders in one location to simplify initial SAS deployment and future maintenance.

- makes applying maintenance and upgrades easier.

  You need only to download the changed depot files instead of having to download an entire SAS order.

- saves disk space.

  Storing multiple orders in a single depot saves disk space, as any content shared between orders is not duplicated, but rather shared, in the depot.

  A single depot in SAS 9.3 can store SAS software installation files for more than one operating system, making the single, multi-system SAS 9.3 depot cumulatively smaller than the multiple, single-system depots in SAS 9.1.3.

- saves download time.

  Because there is a shared copy of common files, the SAS 9.3 single, multi-operating system depot requires smaller amounts to download.

- organizes license keys (also known as SAS installation data files).

  The depot enables you to place SAS installation data files in a standard location to better associate license keys with their corresponding orders. (These files are stored in the **sid_files** directory, directly under the depot's root.)

- identifies multiple orders.

The depot supports the SAS Deployment Wizard's feature that enables you to customize order descriptions and enter notes to better identify multiple orders residing in a single depot.

Because depots contain your personal SAS software order, it is important to use the following best practices for securing and backing up your depot.

Best Practices for SAS Software Depots

For customers who download SAS, their SAS Software Depot is the only copy of their SAS order. The depot contains the files from which SAS is initially installed. For this reason, it is important to use these best practices when managing your depot:

- Keep your depot.

  When you keep your SAS 9.3 depot, applying maintenance and upgrades becomes easier because you need only to download the changed depot files instead of having to download an entire SAS order.

- Locate in an empty directory.

  Create or downloaded your depot into an empty directory that will not be the future location of the SAS installation directory (SASHOME).

- Perform routine backups.

  As with your SAS production system, it is important to routinely back up your SAS Software Depot and verify the integrity of these backups.

  Note: Another important reason for securing and backing up your SAS Software Depot is that there are limits on the number of times that you can download your order from SAS.

- Secure the depot location.

  Problems such as data loss, virus infection, and file corruption can compromise your investment in SAS. It is thus imperative that you have a comprehensive security policy in place to protect your depot.

- Store SAS installation data files with your depot.

  The SAS installation data file for your orders contains information that is integral to successfully deploying SAS. As you get these renewal data files from SAS—such as the file that contains your permanent SAS license key—it is important that you store them with your depot in the **sid_files** directory.

  CAUTION:
  > **Be careful to use the correct installation data file that contains the SAS products that you are planning to install. Using an incorrect file can cause installation failure for SAS add-on products or other errors later when attempting to run SAS.**

- Create a depot administrator.

  Consider designating one or a few users to serve as SAS Software Depot administrators. Persons needing to deploy SAS software or to apply future SAS software maintenance require depot Read and Execute privileges. Depot administration tasks such as initially creating the depot, storing SAS installation data files, and updating order details require depot Write privileges. Separating depot

administration from routine depot usage is a best practice that will further protect your SAS Software Depot.

Creating SAS Software Depots

Overview of Creating SAS Software Depots

There are two ways that you can create a SAS Software Depot:

- Download SAS software.

  When you download a SAS order, the SAS Download Manager automatically creates a SAS Software Depot on your system.

- Run the SAS Deployment Wizard.

  Creating SAS Software Depots is an option on one of the wizard pages.

Before creating a depot, make sure that you have met the necessary requirements described in the following section.

The topics contained in this section are:

Prerequisites for Creating a SAS Software Depot

Before you start creating a SAS Software Depot, make sure that you have met the following prerequisites:

- Choose a machine that has the following:

  - Internet access:

    If you are downloading your SAS order, you will need a machine that can access the SAS download Web site. Also, ideally this machine should be networked so that you can perform deployments directly from the machine, without having to physically relocate the depot to another machine.

  - Java SDK for z/OS installed (z/OS only):

    For more information, go to **http://support.sas.com/resources/ thirdpartysupport/v93/jdks.html**.

  - a Windowing environment:

    If you want to run the download manager and the deployment wizard using a traditional graphical user interface, then on a UNIX or a z/OS system, make sure that a windowing environment such as the Common Desktop Environment or X11 is installed.

    Starting with the March 2012 release of SAS 9.3, the deployment wizard and the download manager can be run on operating systems that do not have windowing systems. For more information, see the *SAS Deployment Wizard and SAS*

> *Deployment Manager User's Guide*, available at: `http://support.sas.com/documentation/installcenter/en/ikdeploywizug/64204/PDF/default/user.pdf`.
>
> *Note:* You have the option of creating a SAS Software Depot on a UNIX or Windows machine and transferring the depot to a z/OS environment using the SAS Software Depot Copy Utility. For more information, see *SAS Deployment Wizard and SAS Deployment Manager 9.3: User's Guide* available at: `http://support.sas.com/documentation/installcenter/en/ikdeploywizug/64204/PDF/default/user.pdf`.

- certain Linux packages and libraries

  - The SAS Download Manager on some 64-bit distributions of Linux might require the compat-libstdc++ RPM.

  - The SAS Download Manager on Red Hat Enterprise Linux version 5 or later requires both the 32-bit and 64-bit versions of the library, libXp.so, to be installed.

  For more information, see the SAS Download Manager README file.

- Designate a target directory.

  Decide where you will create the SAS Software Depot. It is helpful if this directory can be shared on a network and accessible to all of the machines on which you will be installing software from the depot.

  Note: SAS recommends that you not copy a depot from one location to another. Choose a permanent location before you create the depot.

- Grant required access permissions.

  The SAS installer user must have Write access on the depot target directory.

  Windows Vista and later requires that you run the SAS Download Manager installation program using administrator privileges.

- Check disk space requirements.

  Make sure you have enough free disk space available on the target directory.

Finally, just before creating a depot, the SAS Deployment Wizard and the SAS Download Manager both present you with an estimate for required disk space.

Create a Depot By Using the SAS Download Manager

A SAS Software Depot contains SAS order data, an initial SAS installation data file, one or more deployment plan files, order data, and product data. The depot also contains the SAS Deployment Wizard executable—the tool required to install and initially configure SAS.

Note: There is no expiration date for downloading your SAS order. However, if the time period for your initial SAS installation data file has expired, you will have to obtain a current SAS installation data file before you can run the SAS Deployment Wizard.

Before you can create a depot by using the SAS Download Manager, you must first download it. Therefore, the following procedure actually consists of two logical sections:

1. downloading and running the SAS Download Manager

2. downloading a SAS order and creating a software depot using the SAS Download Manager

For z/OS, see *Installation Instructions for SAS 9.3 Electronic Software Delivery for Planning Installations on z/OS*.

Although these sections flow one after the other, at the end of each section, you can stop and resume the process later.

Follow these steps to download a SAS software order and automatically create a depot by using the SAS Download Manager:

1. Locate your software order e-mail (SOE) sent by SAS. In this e-mail, find the URL for the SAS Web site from where you will download the SAS Download Manager.

   Note: It is very important that you locate your original software order e-mail for the correct order and SAS installation key to download the software. You *cannot* use a renewal order number. The renewal order is a license update and it cannot be used to download software. If you cannot locate your original software order e-mail, contact your SAS Installation Representative or SAS Contracts at the following URLs:

   • **http://support.sas.com/adminservices/contact.html**

   • **http://support.sas.com/techsup/license**

2. Ensure that you have fulfilled the necessary requirements described in "Prerequisites for Creating a SAS Software Depot" on page 30.

3. Log on to the machine as a SAS Software Depot administrator or a user with depot Read, Write, and Execute privileges.

   Note: Consider designating one or a few users to serve as SAS Software Depot administrators. Persons needing to deploy SAS software or to apply future SAS software maintenance require depot Read and Execute privileges. Depot administration tasks such as initially creating the depot, storing SAS installation data files, and updating order details require depot Write privileges. Windows Vista and later requires that you run the SAS Download Manager installation program using administrator privileges.

4. Launch a Web browser and navigate to the URL specified in your software order e-mail.

5. At the prompt in the dialog box, select the option that enables you to save the file to disk.

6. Choose a path accessible to the machine to save the download and save the file.

   Your download begins.

7. When your browser has finished downloading the SAS Download Manager, run it and choose the language in which the SAS Deployment Wizard will display messages and prompts.
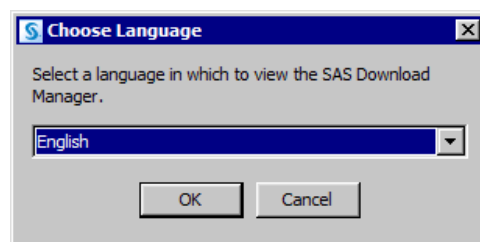
8. At some sites, you might see the page that prompts for proxy information. If so, supply the necessary proxy server settings for the SAS Download Manager to access the Internet. If needed, contact your site's system administrator for help with these settings.

9. When prompted, enter your order number and SAS installation key.

10. Confirm the list of SAS offerings contained in your order. We recommend that you add a product description from your SOE (for example, "TS1M0, Rev. 930_11w29") to distinguish it from other SAS orders. The SAS Deployment Wizard will display this order information during the SAS installation.

   Note: At any time after the download, you can run the SAS Deployment Wizard to add or modify SAS order information details. For more information, see "Change Order Details" on page 50.

11. Select **Include complete order contents** if you do not want to subset your order. This selection will cause the SAS Deployment Wizard to include all the software in the order. For more information, see "Subsetting SAS Software Orders" on page 44.
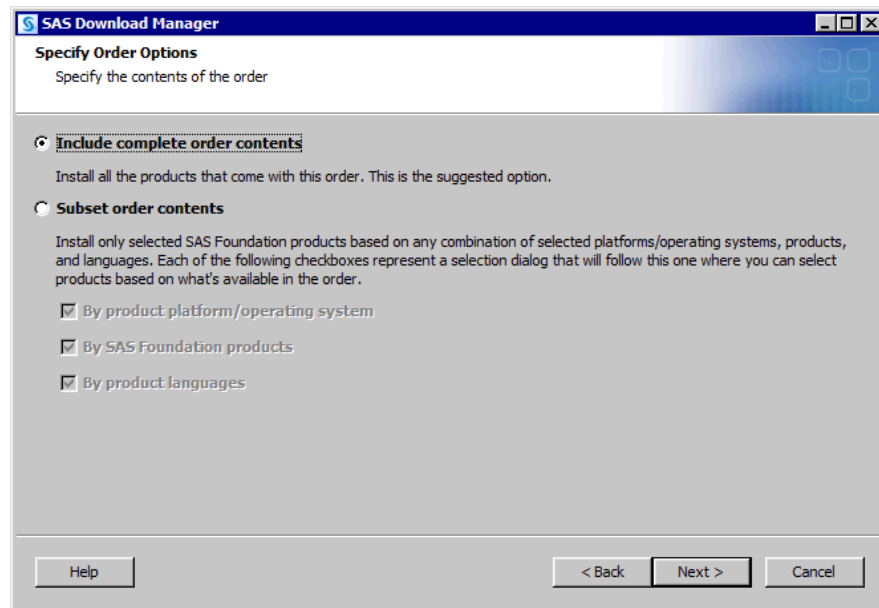
12. Specify a location where you want to download SAS and build the SAS Software Depot.

    We recommend that this directory be empty of any content. The exception is if this location also contains other SAS Software Depots for the same SAS major release as the order.

    For more information, see "Prerequisites for Creating a SAS Software Depot" on page 30.

13. If the directory that you specify does not exist, the wizard prompts you. If you want it to create the directory for you, click **Yes**.

Select an Option

The directory does not exist. Would you like to create it?

[Yes]   [No]
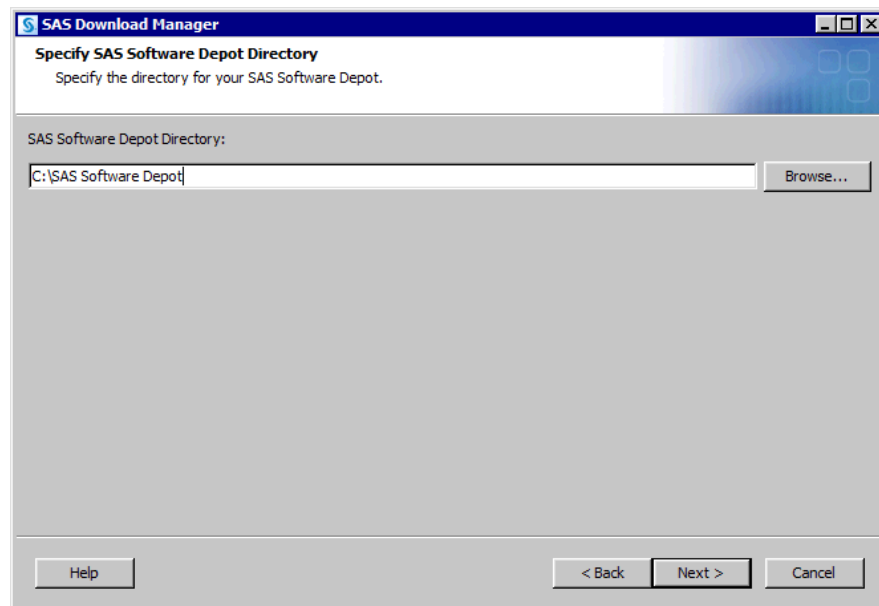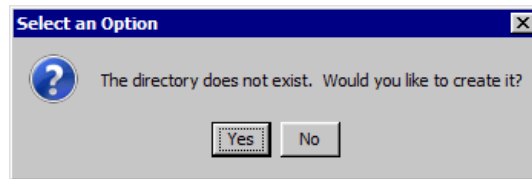
14. The SAS Download Manager has finished collecting order input. This is your last opportunity to change any information before downloading the SAS order and writing files to the target directory.

    Make one of the following choices:

    • Click **Download** to begin downloading the SAS order and writing files in the target directory.

    • Click **Back** to navigate to earlier pages to change order information previously entered.

    • Click **Cancel** to terminate the SAS Download Manager session. Note that you will lose the information previously entered.

      Note: SAS tracks downloads and counts only a *complete* download toward your download limit.

SAS Download Manager

Final Review
    Confirm the following information.

When you click Download, the SAS Download Manager will start downloading the requested software from the Internet and add it to the specified SAS Software Depot.

You are creating a new SAS Software Depot.

SAS Software Depot location:	C:\SAS Software Depot
Order number:	099NVL
Order description:	TS1M0, Rev. 930_11w29
Disk space available (GBs):	21.2
Disk space required (GBs):	10.7
Number of files to be downloaded:	409

Print...

Help   < Back   Download   Cancel

The SAS Download Manager begins downloading, uncompressing, and creating a depot of your SAS order.
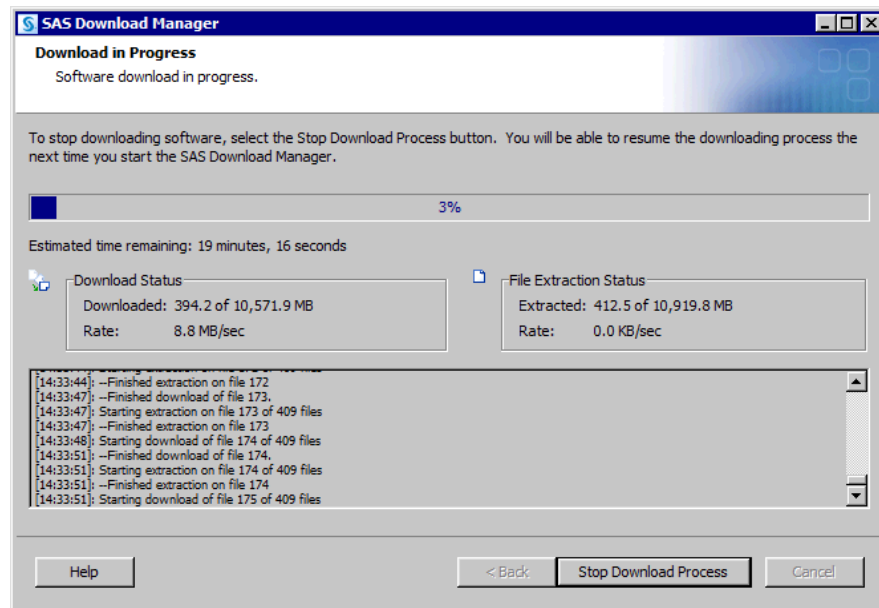
When you see a page similar to the following with the progress indicator at 100%, the SAS Download Manager is finished:
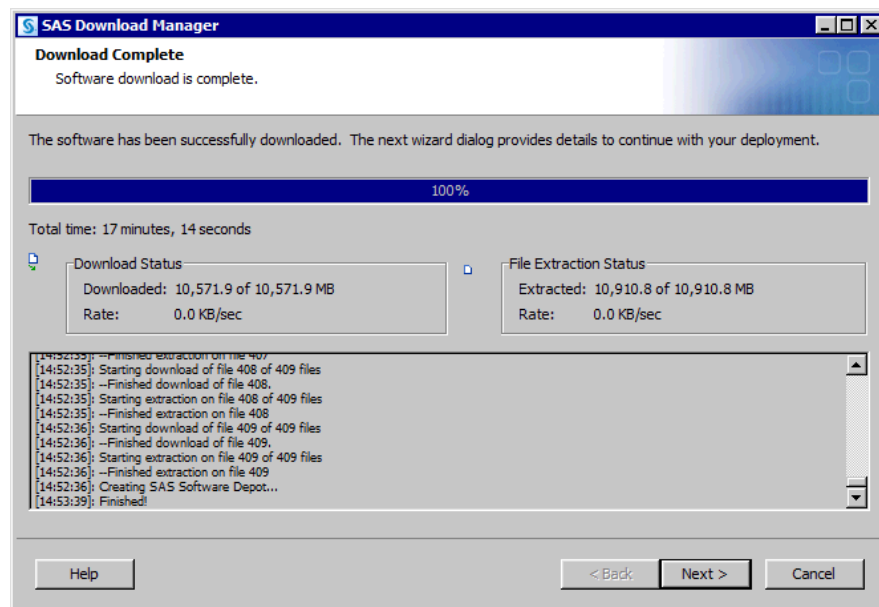
15. Click **Next** to go to the final page, which describes post-download instructions.
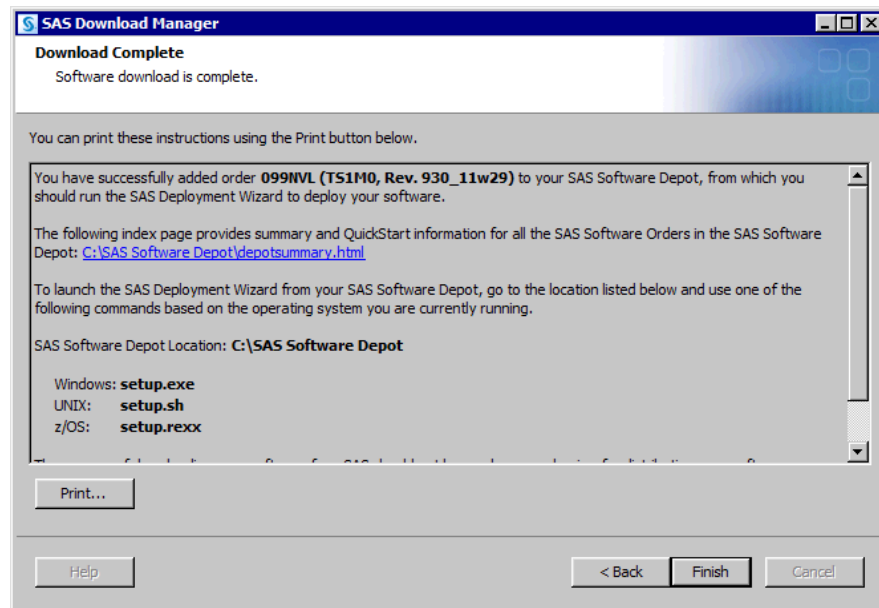
16. Click **Finish** to close the SAS Download Manager.

17. To continue with the software installation, proceed to "Installing Third-Party Products" on page 61.

    After you finish your SAS 9.3 deployment, be sure to keep your depot, as this will make applying maintenance and future upgrades easier.

Create a Depot By Using the SAS Deployment Wizard

You can use the SAS Deployment Wizard to create a copy (or subset) of your SAS Software Depot in another directory. If the new depot location is a remote directory on another machine, the directory must be on a shared network drive accessible from the machine running the wizard.

To create a depot on a machine that does not have shared network storage, you must use another mechanism such as SFTP or SCP to copy the depot. (For more information about these programs, refer to your operating system documentation.)

To create a SAS Software Depot by using the SAS Deployment Wizard, follow these steps:

1. Log on to the machine that will contain the depot as a SAS Software Depot administrator or a user with depot Read, Write, and Execute privileges.

   Note: Consider designating one or a few users to serve as SAS Software Depot administrators. Persons needing to deploy SAS software or to apply future SAS software maintenance require depot Read and Execute privileges. Depot administration tasks such as initially creating the depot, storing SAS installation data files, and updating order details require depot Write privileges.

2. Ensure that you have fulfilled the necessary requirements described in "Prerequisites for Creating a SAS Software Depot" on page 30.

3. Start the SAS Deployment Wizard, using one of two methods:

   • If you are starting the wizard from removable media, proceed as follows, depending on your operating system:

- Windows:

  The **setup.exe** program starts automatically when the media is inserted into the drive.

  Note: If the SAS Deployment Wizard does not start automatically, open Windows Explorer, navigate to the root of the DVD, and double-click **setup.exe**.

- UNIX:

  Navigate to the media's root directory, and type **./setup.sh** at a command prompt.

- z/OS:

  Navigate to the media's root directory, and type **./setup.rexx** at a command prompt.

- If you are starting the wizard from an existing SAS Software Depot, proceed as follows:

  Navigate to the depot's root directory and do one of the following, depending on your operating system:

  - Windows:

    Double-click **setup.exe**.

  - UNIX:

    Type **./setup.sh** at a command prompt.

  - z/OS:

    Type **./setup.rexx** at a command prompt.

4. Choose the language in which the SAS Deployment Wizard will display messages and prompts.

5. Select **Create or Add to a New SAS Software Depot**. Do *not* **Install SAS Software**.
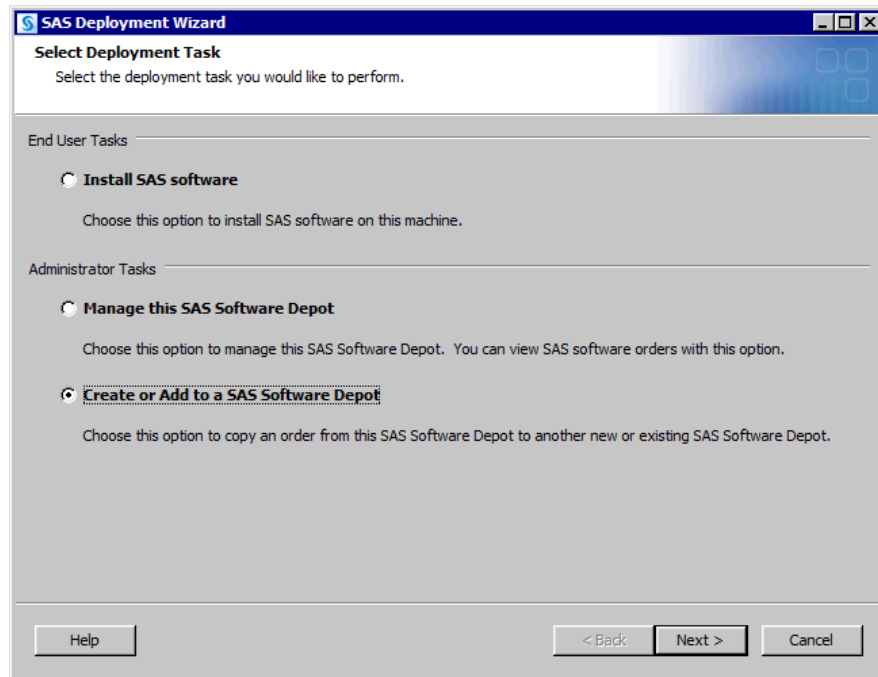
6. Confirm the list of SAS offerings contained in your order.

   We recommend that you update the description for your order and include any notes to distinguish it from other SAS orders. The SAS Deployment Wizard will display this order information during the SAS installation.
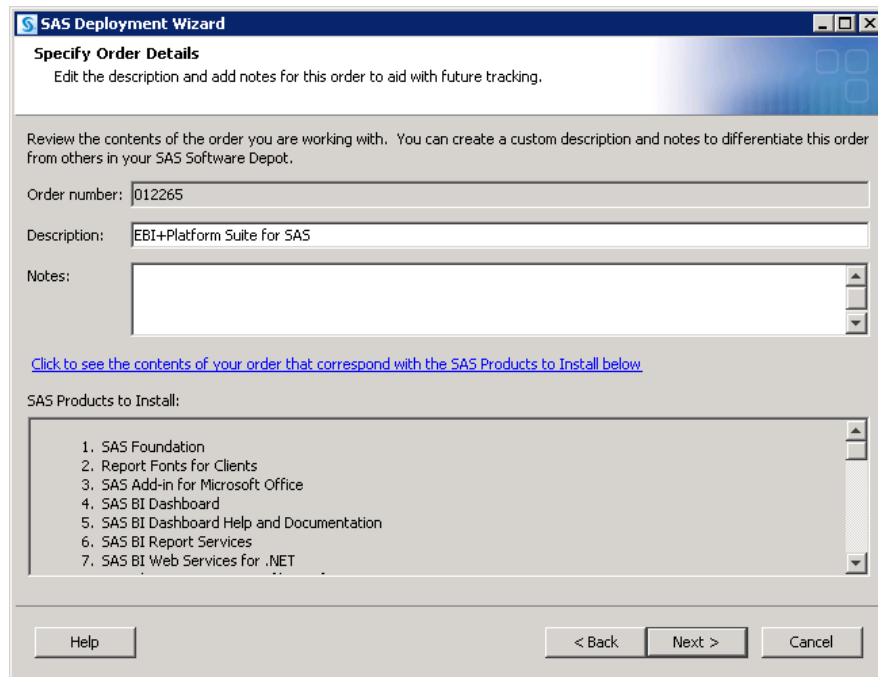
   Note: At any time after the download, you can rerun the SAS Deployment Wizard to add or modify SAS order information details. For more information, see "Change Order Details" on page 50.

7. If you have multiple orders in your depot, you must pick the order for which you want to create a new depot. (Creating unique order descriptions helps you to choose the correct order with which to create a new depot.)

8. Select **Include complete order contents** if you do not want to subset your order. This selection will cause the SAS Deployment Wizard to include all the software in the order. For more information, see "Subsetting SAS Software Orders" on page 44.
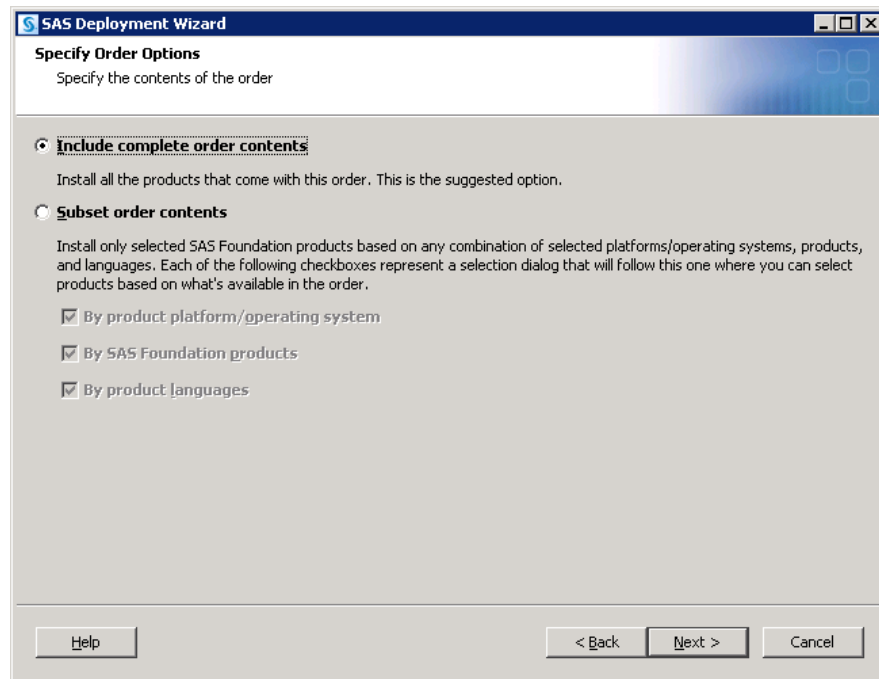
9. Specify a location where you want to download SAS and build the software depot. (This location can be shared storage that physically resides on another machine.)

   We recommend that this directory be empty of any content. The exception is if this location also contains other SAS Software Depots for the same SAS major release as the order.

   For more information, see "Prerequisites for Creating a SAS Software Depot" on page 30.
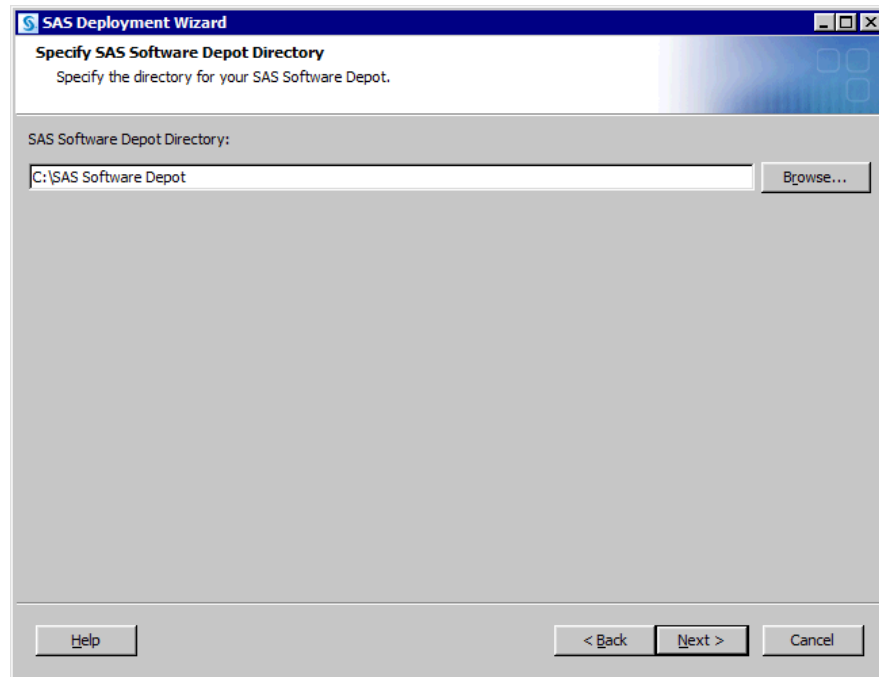
10. If the directory that you specify does not exist, the wizard prompts you. If you want it to create the directory for you, click **Yes**.
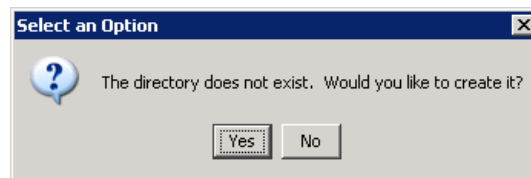
11. The SAS Deployment Wizard has finished collecting order input. This is your last opportunity to change any information that you have provided before the wizard begins writing files to the target directory.

    Make one of the following choices:

    - Click **Start** to begin creating the depot in the target directory.

    - Click **Back** to navigate to earlier wizard pages to change order information previously entered.

    - Click **Cancel** to terminate the wizard session. Note that you will lose order information previously entered.
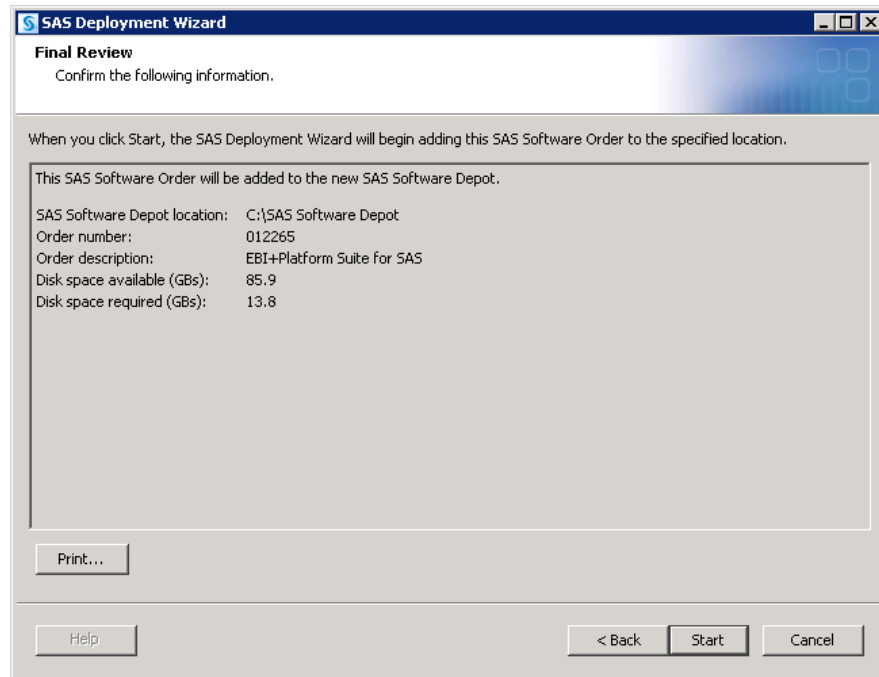
12. If you are running the SAS Deployment Wizard from removable media, the SAS Deployment Wizard prompts you for a DVD. Continue to supply discs as prompted.

    Note: If you are working on a UNIX system without an automounter, mount the DVD drive. For information about the privileges required to mount a device and the syntax of the **mount** command for your system, see the *SAS Deployment Wizard and SAS Deployment Manager User's Guide* available at: **http://support.sas.com/documentation/installcenter/en/ikdeploywizug/64204/PDF/default/user.pdf**.

    The SAS Deployment Wizard begins creating a depot of your SAS order.
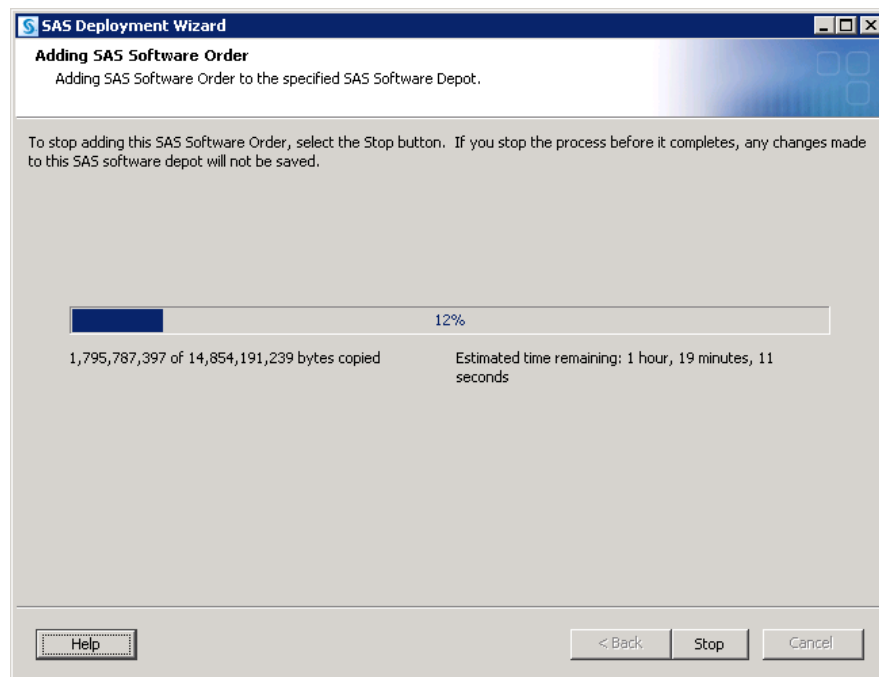
13. When you see a page similar to the following with the progress indicator at 100%, the SAS Deployment Wizard is finished:
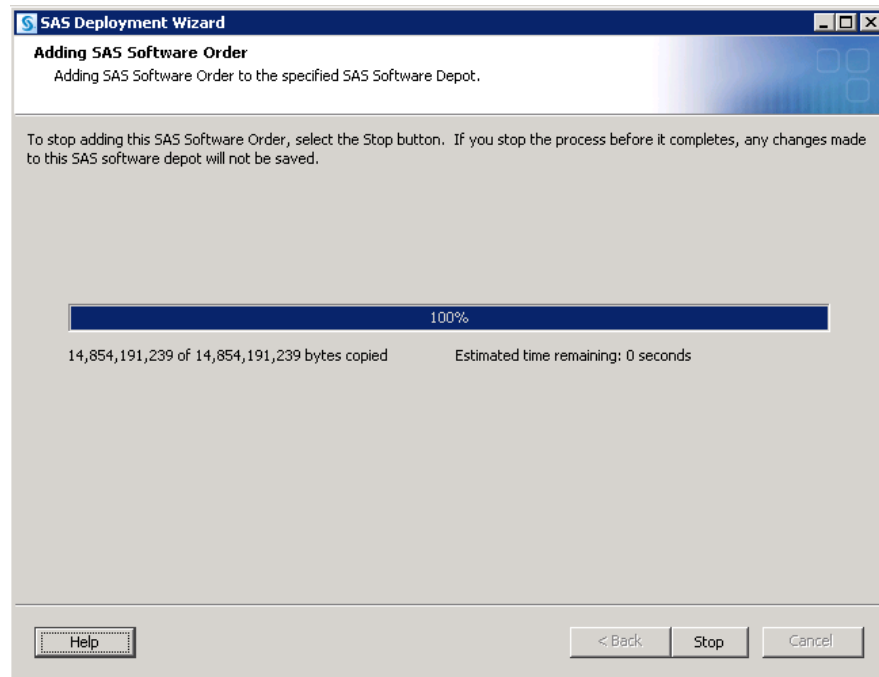
14. Click **Next** to go to the final page, which contains instructions for what to do after creation of the software depot.

15. Click the `depotsummary.html` link on the page to review the SAS QuickStart Guide.
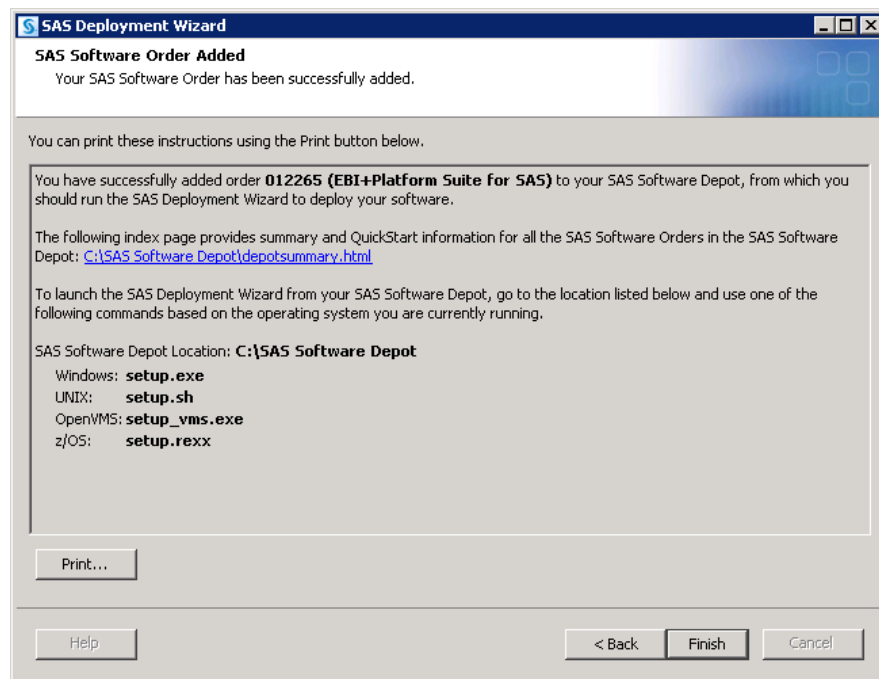
16. Click **Finish** to close the SAS Deployment Wizard.

17. If you are using removable media on a UNIX system where an automounter is being used, use the `eject` command to remove the DVD. On a UNIX system without an

automounter, you must unmount the drive by using the `umount` command and then manually opening the drive. For information about the `umount` command that is needed to unmount a device on your system, see the *SAS Deployment Wizard and SAS Deployment Manager User's Guide* available at: `http:// support.sas.com/documentation/installcenter/en/ ikdeploywizug/64204/PDF/default/user.pdf`.

18. To continue with the software installation, proceed to "Installing Third-Party Products" on page 61.

    After you finish your SAS 9.3 deployment, be sure to keep your depot, as this will make applying maintenance and future upgrades easier.

Subsetting SAS Software Orders

Overview of Subsetting SAS Software Orders

The SAS Deployment Wizard enables you to break up—or subset—your SAS software order.

Display 3.1   Specify Order Options Page
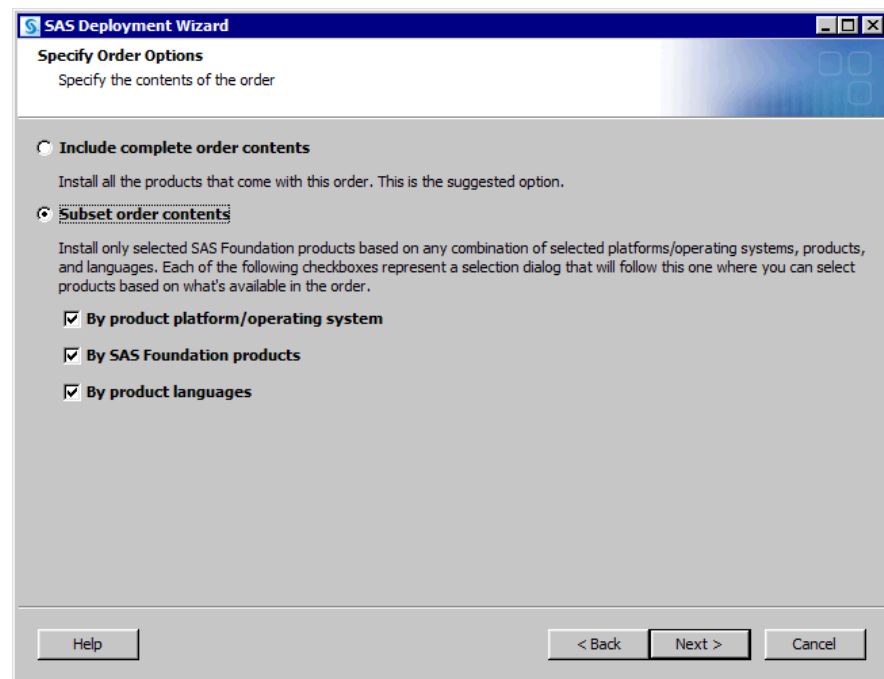
You can create a subset of your order using any or all of the following characteristics:

- product operating system
- SAS Foundation products
- product language

The deployment wizard also enables you to create a listing of the contents for subsetted orders. For more information, see "List Contents of Subsetted Orders" on page 49.

Subset a SAS Software Order

You can break up or subset your SAS software order according to operating system, language, or SAS Foundation. Subsetting your order makes it easier to distribute and conserves disk space.

To subset your order, follow these steps:

1. Log on to the depot machine as a SAS Software Depot administrator or a user with depot Read, Write, and Execute privileges.

   Note: Consider designating one or a few users to serve as SAS Software Depot administrators. Persons needing to deploy SAS software or to apply future SAS software maintenance require depot Read and Execute privileges. Depot administration tasks such as initially creating the depot, storing SAS installation data files, and updating order details require depot Write privileges.

2. Start the SAS Deployment Wizard. Navigate to the SAS Software Depot's root directory and, depending on your operating system, do the following:

   - Windows:

     Double-click **setup.exe**.

   - UNIX:

     Type **./setup.sh** at a command prompt.

   - z/OS:

     Type **./setup.rexx** at a command prompt.

3. Choose the language in which the SAS Deployment Wizard will display messages and prompts.

4. Select **Create or Add to a SAS Software Depot**.
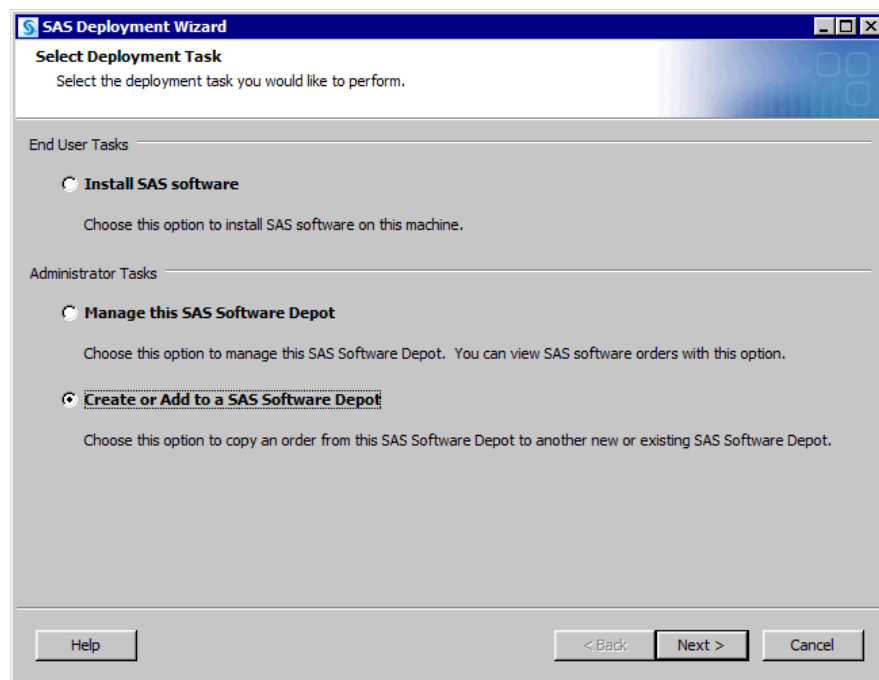
5. If you have more than one order, choose the order that you want to subset, and then select **Next**.
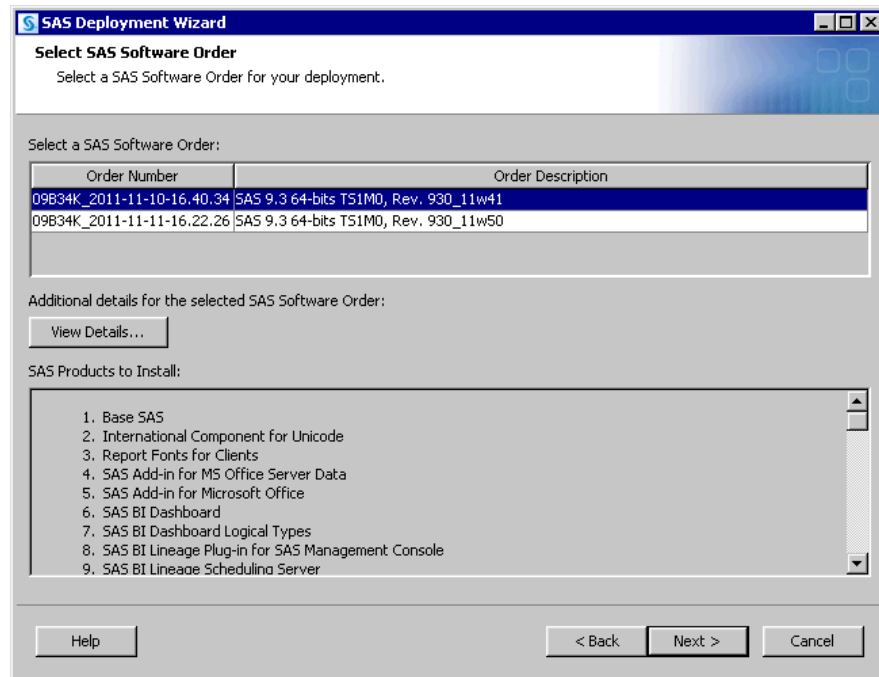
6. We strongly recommend that you update the description for your order and include any notes about your order that might help you distinguish it from any other SAS orders. The SAS Deployment Wizard will display this order information during the SAS installation. Adding a description is the only way to identify what is in your order subset, aside from running the deployment wizard.
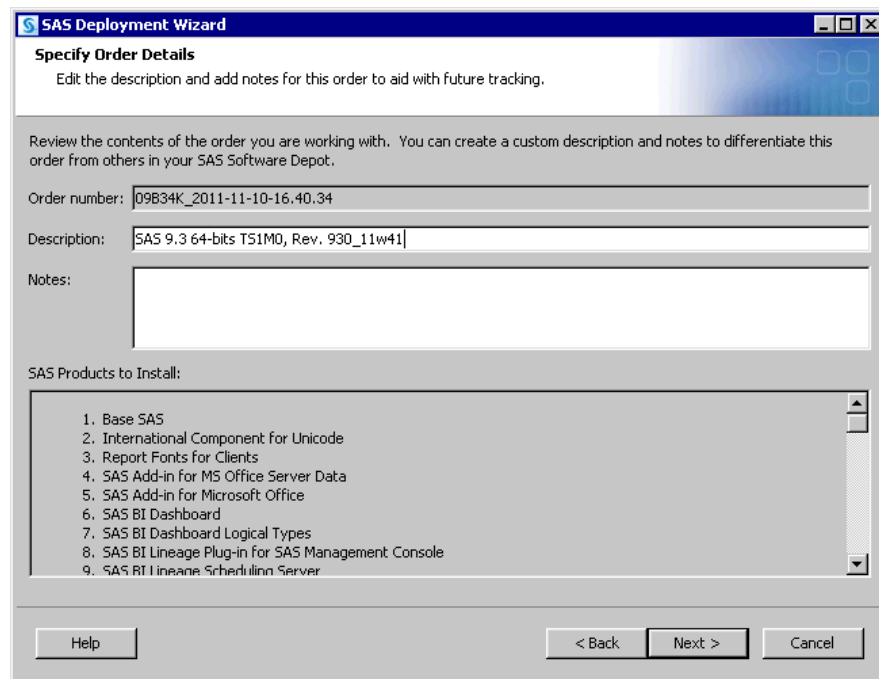
7. When you are finished adding order details, select **Next**.

8. Select **Subset order contents** and further refine your new depot by one or more of the following characteristics:

- product operating system

  Pick and eliminate products from being included by the operating systems that they work on.

- SAS Foundation products

  Choose SAS products that you want to include in the SAS Software Depot by name. (If you have used command line options to begin the subsetting process, this option appears as **By products**.)

- product language

  Choose SAS products by the language that they will be installed with.
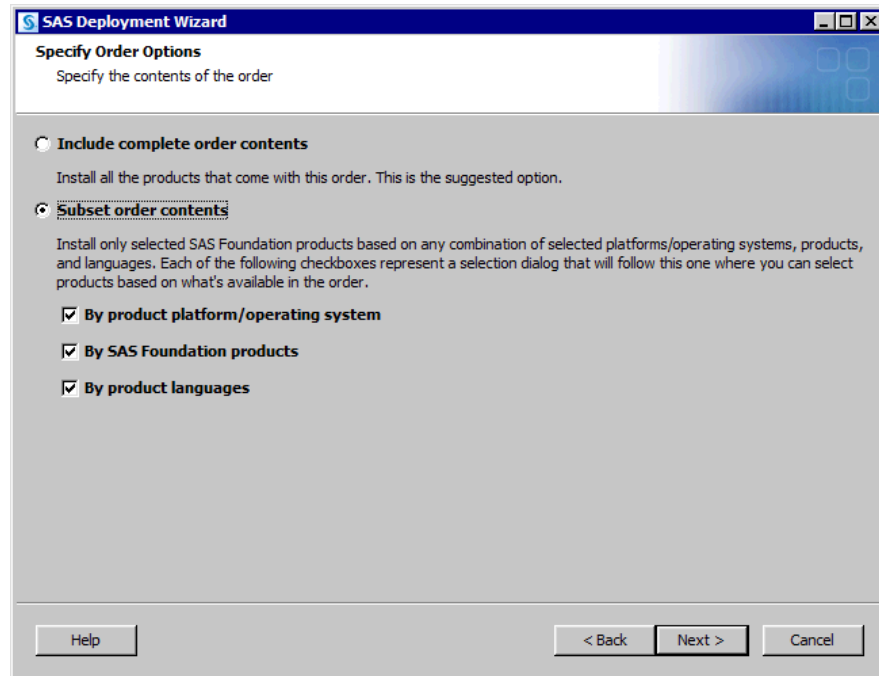
9. Depending on which characteristics you have chosen to subset your order on, you see various wizard pages where you can refine your depot further. Make your selections and select **Next**.
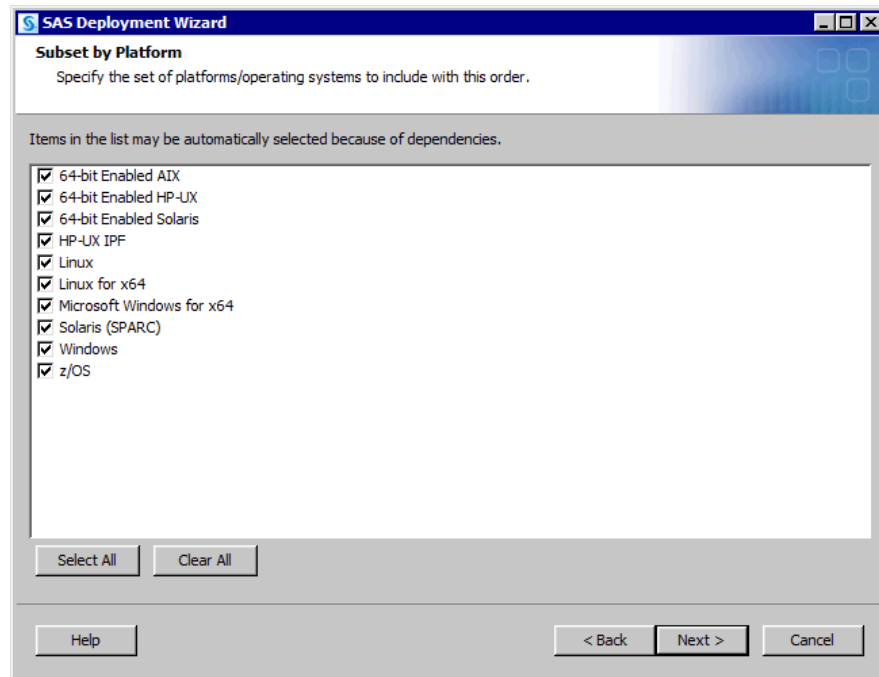
10. Specify a new directory where the deployment wizard will create your new depot and select **Next**.
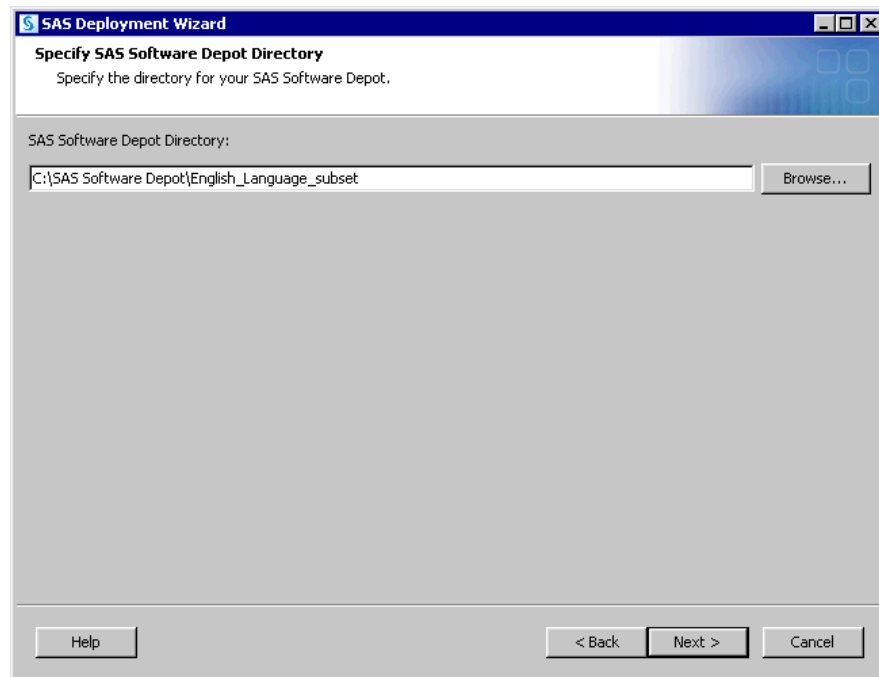
11. Review the Final Review page. If you are satisfied, select **Start**. Otherwise, select **Back** and make the necessary changes.

12. When the new depot has been created, select **Finish** to close the SAS Deployment Wizard.

List Contents of Subsetted Orders

It is helpful to know exactly which SAS products are contained in an order that has been subsetted. The SAS Deployment Wizard provides a method to enable you to create a listing of all SAS products contained in an order. You generate this listing by using a command line switch when you invoke the wizard:

• Windows

   setup.exe -listdepot *output-pathname*

• UNIX

   setup.sh -listdepot *output-pathname*

• z/OS

   setup.rexx -listdepot *output-pathname*

For example, a command on Solaris might resemble the following:

./setup.sh —listdepot /mydata/order_contents.txt

The deployment wizard executable resides in the root of your SAS Software Depot.

The listing resembles the following:

```
Date: 2011 Dec 12 10:02:56
Depot: /nfs/mymachine/vol/vol7/sas_software_depot

Order: 099SPS
+ Base SAS [base__93ts1m0__mvs__ne__sp0__1]
+ Base SAS [base__93ts1m0__mvs__w0__sp0__1]
+ Base SAS Help and Documentation [basedoc__93110__prt__xx__sp0__1]
+ Base SAS JAR Files [basejars__93110__prt__xx__sp0__1]
<...>

Order: 099SQ2_2011-12-01-12.27.01
+ Advanced Analytics Common Components [aacomp__93110__wx6__en__sp0__1]
+ DATA Step to DS2 Translator [accelmva__93160__wx6__en__sp0__1]
+ Microsoft Office Access Database Engine 2010 [ace__93112__prt__xx__sp0__1]
- SAS/GRAPH ActiveX Control [activexgraph__93230__win__de__sp0__1]
+ SAS/GRAPH ActiveX Control [activexgraph__93230__win__en__sp0__1]
- SAS/GRAPH ActiveX Control [activexgraph__93230__win__es__sp0__1]
```

The following list describes the how to interpret the output.

A line beginning with a:

• colon (:)—indicates that the order number being listed.

• plus sign (+)—indicates that the product is in the order.

• minus sign (-)—indicates that the product is in the depot but is not in the specified order.

For more information, see the *SAS Deployment Wizard and SAS Deployment Manager User's Guide* available at: **http://support.sas.com/documentation/ installcenter/en/ikdeploywizug/64204/PDF/default/user.pdf**.

Managing SAS Orders

Overview of Managing SAS Orders

Using the SAS Deployment Wizard, you can do the following with your SAS order:

Change Order Details

Being able to identify a SAS order is important, especially when your SAS Software Depot contains multiple orders. To change the details of a SAS order, follow these steps:

1. Log on to the depot machine as a SAS Software Depot administrator or a user with depot Read, Write, and Execute privileges.

   Note: Consider designating one or a few users to serve as SAS Software Depot administrators. Persons needing to deploy SAS software or to apply future SAS software maintenance require depot Read and Execute privileges. Depot administration tasks such as initially creating the depot, storing SAS installation data files, and updating order details require depot Write privileges.

2. Start the SAS Deployment Wizard. Navigate to the SAS Software Depot's root directory and, depending on your operating system, do the following:

   - Windows:

     Double-click **setup.exe**.

   - UNIX:

     Type **./setup.sh** at a command prompt.

   - z/OS:

     Type **./setup.rexx** at a command prompt.

3. Choose the language in which the SAS Deployment Wizard will display messages and prompts.

4. Select **Manage this SAS Software Depot**.

5. Choose the order for which you want to change details, and then select **Change Details**.
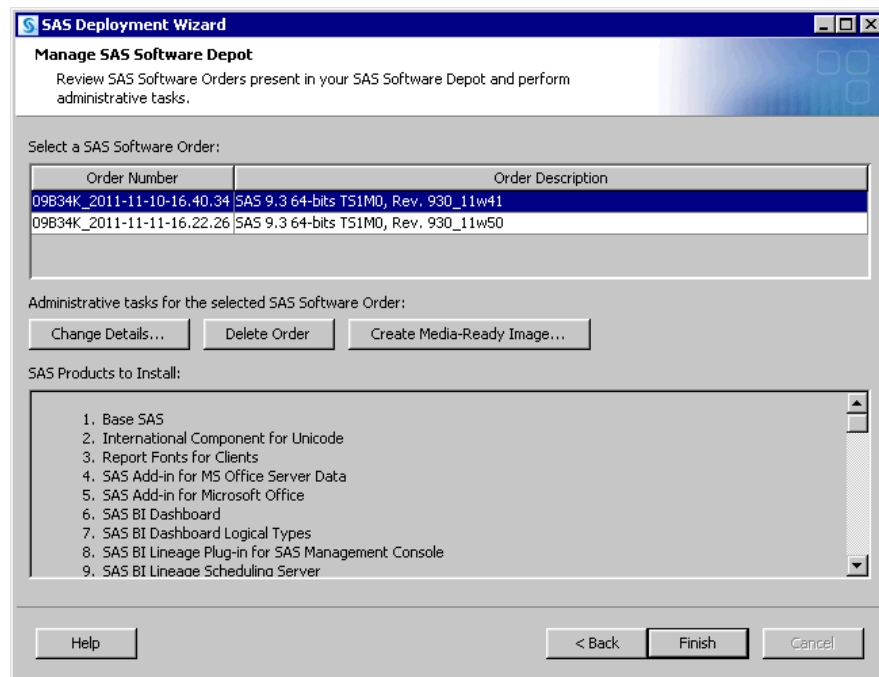

6. Update the description for your order and include any notes about your order that might help you distinguish it from any other SAS orders. The SAS Deployment Wizard will display this order information during the SAS installation.
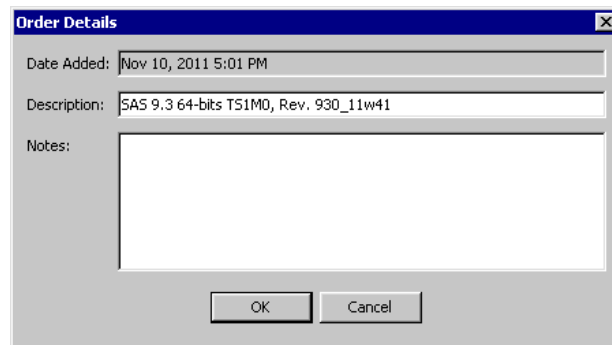
7. When you are finished adding order details, select **OK**.

8. Select **Finish** to close the SAS Deployment Wizard.

Delete an Order

To delete a SAS order, follow these steps:

CAUTION:

> **It is a best practice to always make sure that you have backed up the SAS Software Depot before deleting an order. Keep in mind that there are limits on the number of times that you can download an order from SAS.**

1. Log on to the depot machine as a SAS Software Depot administrator or a user with depot Read, Write, and Execute privileges.

   Note: Consider designating one or a few users to serve as SAS Software Depot administrators. Persons needing to deploy SAS software or to apply future SAS software maintenance require depot Read and Execute privileges. Depot administration tasks such as initially creating the depot, storing SAS installation data files, and updating order details require depot Write privileges.

2. Start the SAS Deployment Wizard. Navigate to the SAS Software Depot's root directory, and, depending on your operating system, do the following:

   • Windows:

     Double-click **setup.exe**.

   • UNIX:

     Enter **./setup.sh** at a command prompt.

   • z/OS:

     Enter **./setup.rexx** at a command prompt.

3. Choose the language in which the SAS Deployment Wizard will display messages and prompts.

4. Select **Manage this SAS Software Depot**.
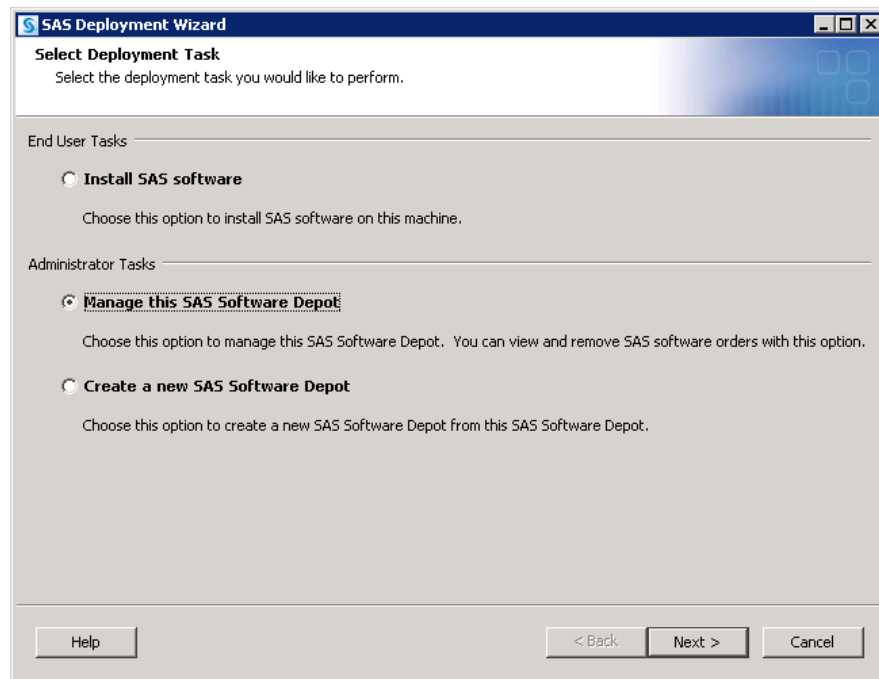
5. Choose the order that you want to delete, and then select **Delete Order**.
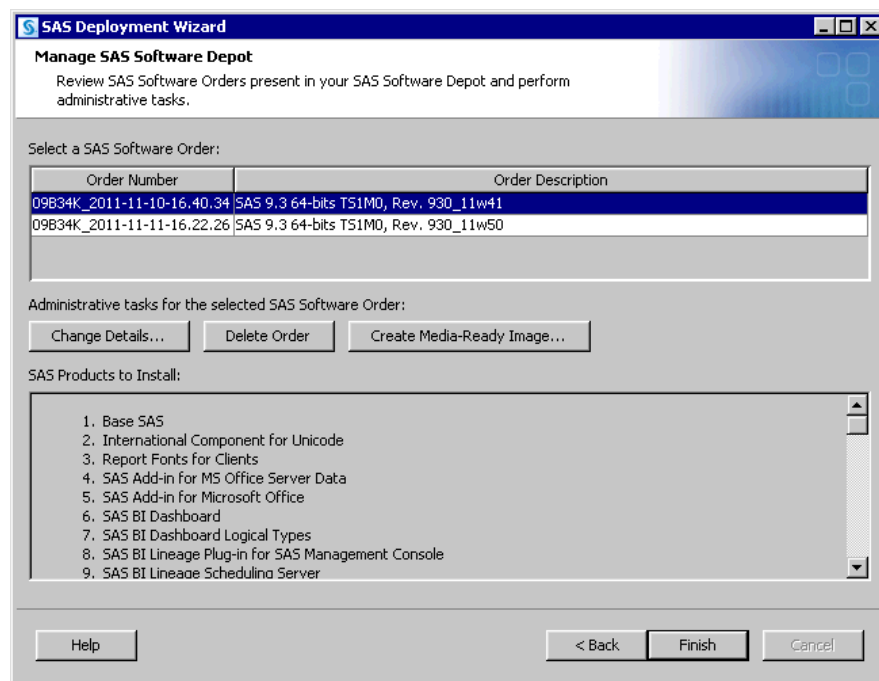
6. Confirm that you want to delete the order by selecting **Yes**.
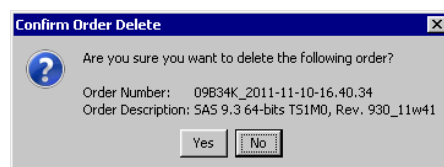
The SAS Deployment Wizard begins to delete your order. When all the order's files have been removed, the Manage SAS Software Depot page appears again, without the deleted order listed.

7. Select **Finish** to close the SAS Deployment Wizard.

Create a Disc Image of Your Order

If you have SAS running on remote sites that do not have access to the network on which your SAS Software Depot resides, you can use the SAS Deployment Wizard to create an ISO image of your SAS software order. Then, using a media creation tool of your choice, you can write the image to the removable media format that you specify: either CDs or DVDs.

You can create a disc image on a per order basis only. If your SAS Software Depot consists of more than one order, then you have to make multiple disc images.

To create a disc image of your SAS order, follow these steps:

1. Log on to the depot machine as a SAS Software Depot administrator or a user with depot Read, Write, and Execute privileges.

   Note: Consider designating one or a few users to serve as SAS Software Depot administrators. Persons needing to deploy SAS software or to apply future SAS software maintenance require depot Read and Execute privileges. Depot administration tasks such as initially creating the depot, storing SAS installation data files, and updating order details require depot Write privileges.

2. Start the SAS Deployment Wizard. Navigate to the SAS Software Depot's root directory, and, depending on your operating system, do the following:

   • Windows:

     Double-click **setup.exe**.

   • UNIX:

     Type **./setup.sh** at a command prompt.

   • z/OS:

     Type **./setup.rexx** at a command prompt.

3. Choose the language in which the SAS Deployment Wizard will display messages and prompts.

4. Select **Manage this SAS Software Depot**.

5. Choose the order for which you want to create a disc image, and then select **Create Media-Ready Image**.
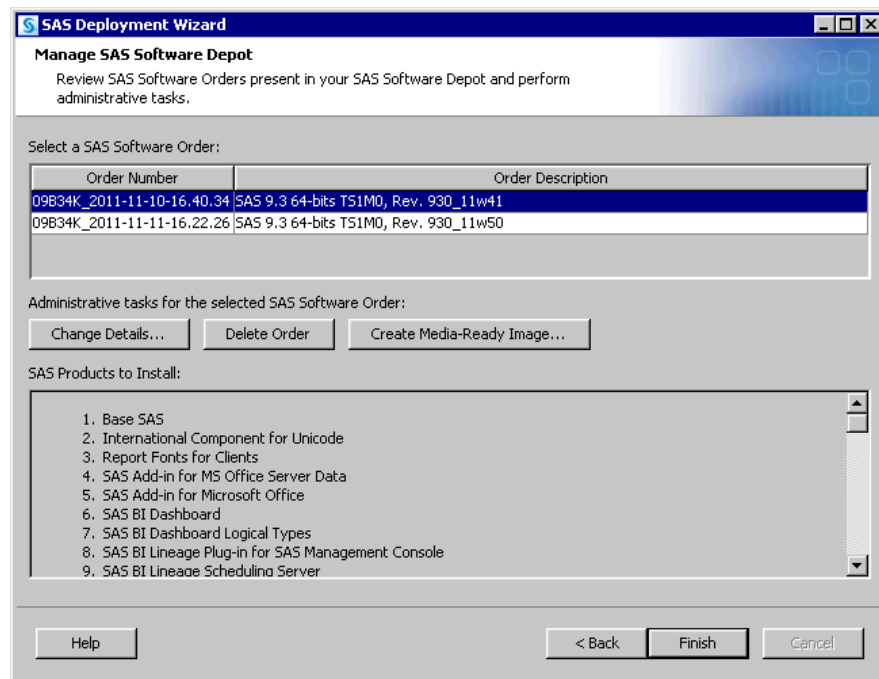
6. Choose the type of media (CDs or DVDs) for which you want to create an image of your SAS software order. Also, provide the path where you want the SAS Deployment Wizard to write this image. When you are ready, select **Start**.
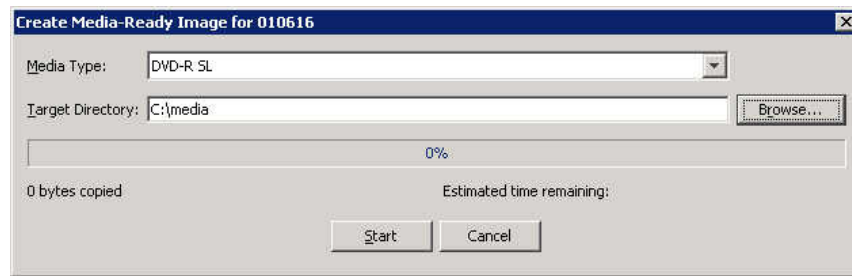
The SAS Deployment Wizard begins writing SAS order files to the target directory.

7. When the progress indicator displays 100%, the image is complete and you can select **OK**.
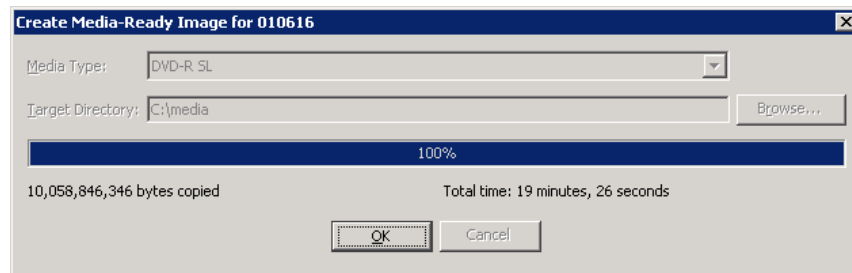
8. Select **Finish** to close the SAS Deployment Wizard.

The file system that the SAS Deployment Wizard has created is an ISO image of your SAS order that is logically arranged into directories that map to either CD-ROM or DVD disc. Each directory also contains a summary to enable you to maintain media labels.
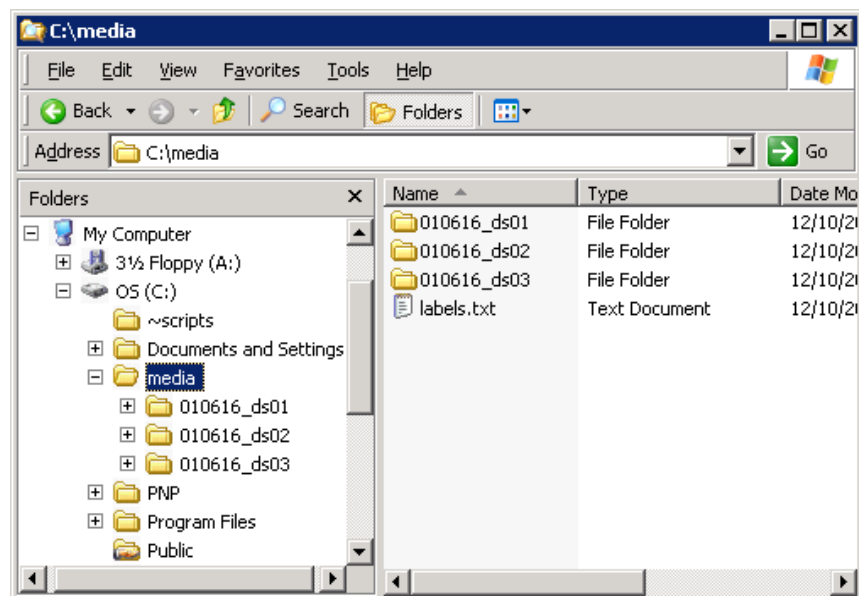
9. Using a media creation tool of your choice, you can now write the installable image of your SAS order to the type of removable media that you specified earlier: either CDs or DVDs.

Checking Your SAS Software Depot

Overview of Checking Your SAS Software Depot

In the March 2012 release of SAS 9.3, SAS provides a utility with which you can verify the integrity of your SAS Software Depot. The SAS Software Depot Check Utility walks through your depot and assembles a list of the files contained in the depot. The utility identifies any missing files. For the files that it locates, that utility attempts to validate their size, checksum, and date-and-time stamp.

The depot check utility generates a text file report in which it lists the results of its various validation tests in the file sas_depot_check.out. The utility also attempts to fix any problems that it encounters. Any fixes that it makes are written in a second output file, sas_depot_check.update.

The following is the content of sas_depot_check.out from a depot check run on UNIX:

```
SAS Software Depot Check Utility version 4.3

 Missing File(s)
   No files are missing.

 Wrong Size File(s)
   All files had the correct size.

 Wrong Checksum File(s)
   All files had the correct checksum.

 Wrong Owner File(s) (Execute /home/sas/sas_depot_check.update for fix)
   All files had the correct owner.

 Wrong Group File(s) (Execute /home/sas/sas_depot_check.update for fix)
   All files had the correct group.

 Wrong Permission File(s) (Execute /home/sas/sas_depot_check.update for fix)
   /sas_software_depot/order_data/09B9WN/order.xml
   /sas_software_depot/cd.id

 Missing volsers in cd.id that have been corrected
   All volsers were listed in cd.id.
```

The following is the content of sas_depot_check.update performed on UNIX:

```
chmod 755 "/sas_software_depot/order_data/09B9WN/order.xml"
chmod 755 "/sas_software_depot/cd.id"
```

You run the utility as a command with various options on Windows and UNIX systems only. On Windows, a graphical user interface is also available.

For more information, see the following:

- "Check Your SAS Software Depot on Windows" on page 58
- "Check Your SAS Software Depot on UNIX" on page 60

• The *SAS Deployment Wizard and SAS Deployment Manager User's Guide*, available at `http://support.sas.com/documentation/installcenter/en/ikdeploywizug/64204/PDF/default/user.pdf`.

Check Your SAS Software Depot on Windows

In the March release of SAS 9.3, SAS provides a utility with which you can verify the integrity of your SAS Software Depot. For more information see, "Checking Your SAS Software Depot" on page 57.

To run the SAS Software Depot Check Utility on Windows, follow these steps:

Note: It is recommended that you use the same Windows user account with which the SAS Software Depot was created to run the SAS Software Depot Check Utility.

1. Locate the `utilities\depotchecker` directory under your SAS Software Depot directory, and click **OK**.

2. Double-click SASDepotCheck.exe.

3. In the dialog box that appears, navigate to the top level directory of your depot.
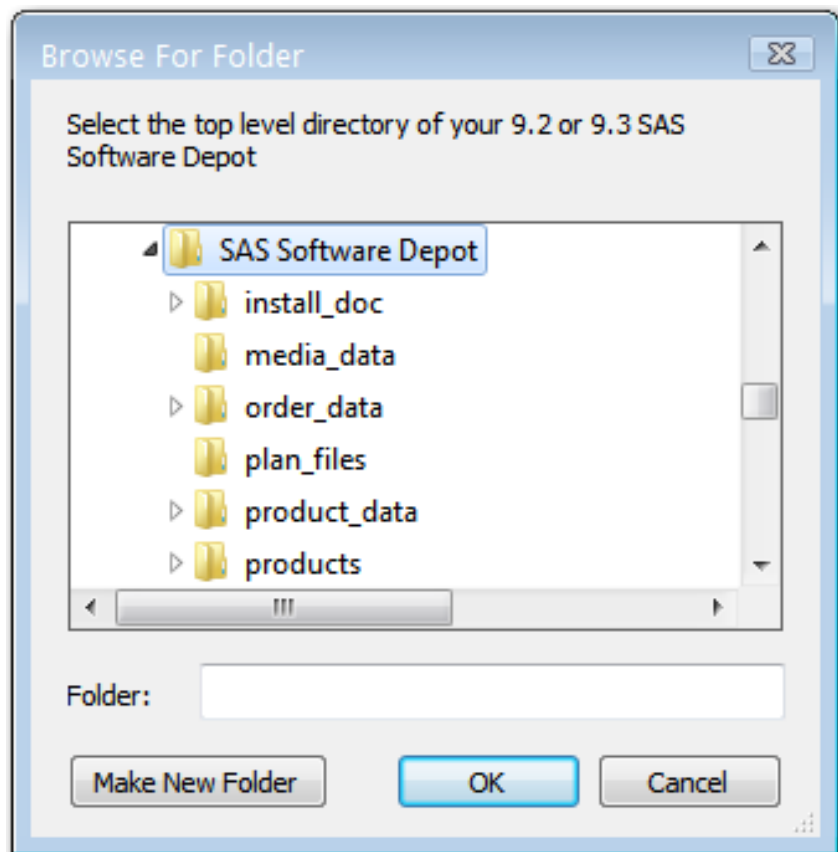
4. In the dialog box that appears, navigate to the directory where you want the utility to write its output and click **Open**. (This output will be in the form of one or more text files.)
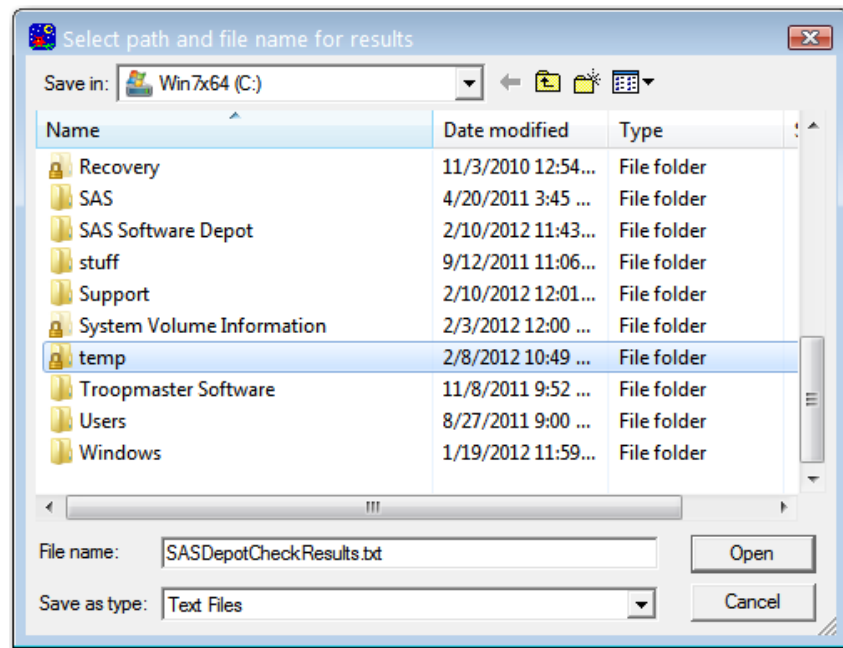
5. The utility asks whether you want it to continue checking your depot if it finds more than ten problems. Click **Yes**.
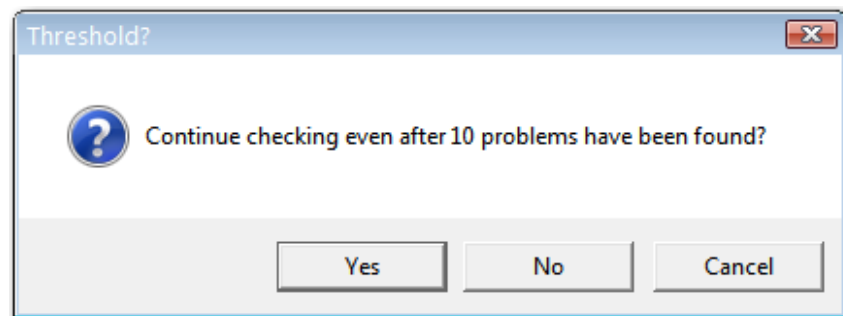
6. The utility asks whether you want it to list all of the files that it examines in its output report file. Click **Yes**.
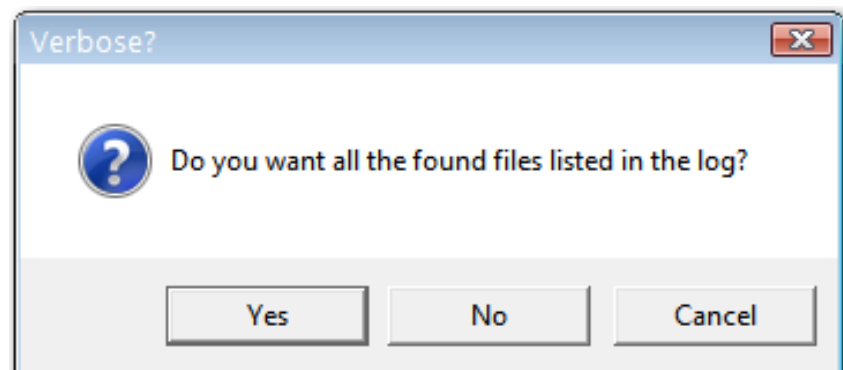
The utility begins sweeping your depot. The time required to complete the sweep depends on the size of your depot.
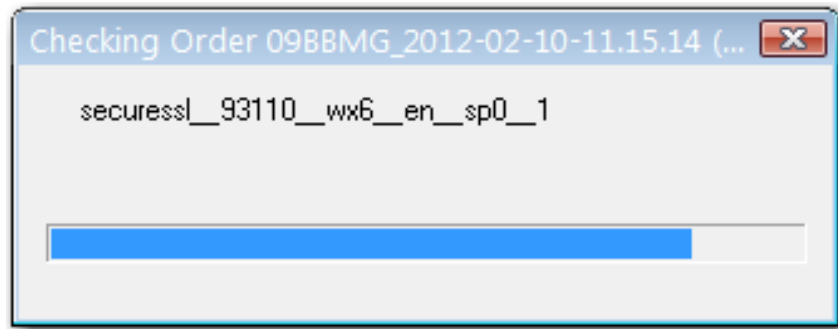
7. When the utility has finished executing, its output should automatically open in your default text editor.

   If this does not happen, navigate to the output directory that you specified earlier, and open SASDepotCheckResults.txt.

Check Your SAS Software Depot on UNIX

In the March 2012 release of SAS 9.3, SAS provides a utility with which you can verify the integrity of your SAS Software Depot. For more information see, "Checking Your SAS Software Depot" on page 57.

To run the SAS Software Depot Check Utility on UNIX, follow these steps:

Note: It is recommended that you use the same UNIX user account with which the SAS Software Depot was created to run the SAS Software Depot Check Utility.

1. Navigate to the **utilities/depotchecker** directory under your SAS Software Depot directory.

2. Type the following command:

   ```
   ./sas_depot_check.sh -i depot_root_directory -o output_file_path
   ```

   • *depot_root_directory* (required) is the top level directory of your SAS Software Depot.

   • *output_file_path* (required) the absolute directory path for where the utility writes its output (one or more text files).

   You can also specify these options:

   -t
      (Optional) causes the utility to stop checking the depot if it finds more than ten problems.

   -v
      (Optional) writes all the found depot files in the text file that the utility outputs.

Chapter 4
Installing Third-Party Products

Overview of Installing Third-Party Products

Third-party products play an important role in the SAS Intelligence Platform. For
example, if your system includes Web applications such as SAS Web Report Studio or
the SAS Information Delivery Portal, you will need to install third-party products such

as a Java Development Kit (JDK) and a Web application server in order to compile and execute these applications.

Installing required third-party software is the fourth of five steps in deploying SAS:

1. Review additional documentation.

2. Create operating system users and groups and designate ports.

3. Create a SAS Software Depot.

⇨ **4. Install required third-party software.**

5. Install and configure SAS.

About Installing Third-Party Products

The SAS desktop client applications and majority of Java applications are supported on Microsoft Windows systems only. The exception is SAS Management Console, which also runs on several UNIX platforms. All of the Java applications require the Java Runtime Environment (JRE), which includes a Java Virtual Machine (JVM) that executes the application and a set of standard Java class libraries. The SAS Deployment Wizard will install the default version of the 32-bit JRE with which SAS has been tested. If a different supported version of the JRE is required, it can be obtained from the appropriate vendor's Web site. Links to the appropriate JRE vendor's Web site can be found on the SAS 9.3 third-party support site located at **http://support.sas.com/ resources/thirdpartysupport/v93**.

During a first-time SAS 9.3 deployment, the SAS Deployment Wizard prompts you for the version of the JRE that you want to use with the SAS Java applications. Your options are to have the deployment wizard install a JRE that SAS has certified to run with SAS 9.3, or to point to a JRE that you have already installed. (In most situations where you are updating or adding a product to SAS 9.3, the deployment wizard does not prompt you for a JRE. However, you can override this behavior. For more information, see "Specify a Different JRE" on page 167.)

On z/OS only, your options are to point to a JRE that you have already installed, or install your software without a JRE.

In most cases, before you can install and configure a SAS 9.3 middle tier, you must have installed a Web application server and a 64-bit JDK that is supported by SAS. (If you are using WebSphere Application Server, then the JDK is supplied when you install WebSphere Application Server.) SAS identifies the supported software versions at: **http://support.sas.com/resources/thirdpartysupport/v93**.

When you run the deployment wizard on the middle-tier machine, it prompts you for paths to these third-party software products, checks to make sure that the software versions are supported by SAS, and does not allow you to proceed with the software installation unless the software is installed. However, some sites separate SAS administration from Web application server administration, and it might not be possible to run the deployment wizard on the middle-tier machine.

For the sites that do not permit running the deployment wizard on the middle-tier machine, the wizard enables the SAS administrator to create a middle-tier configuration on a machine that does *not* contain a Web application server. After the configuration is complete, the SAS administrator compresses the Web tier configuration and hands it off to his Web administrator counterpart to deploy on the target Web application server machine. For more information, see "Building a Web Application Server Configuration for Deployment on Another Machine" on page 65.

The Web application server administrator can then choose to use configuration scripting tools provided by SAS to configure the middle-tier environment on the target machine, or the administrator can configure the middle-tier manually. For more information about the configuration scripting tools, see Chapter 14, "SAS Configuration Scripting Tools," in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Note: SAS 9.3 supports JRockit as an alternative JDK for WebLogic. For more information, see **http://support.sas.com/resources/thirdpartysupport/v93/jdks.html**.

Use the manufacturer's distribution package to install the JDK. Make sure that you have a properly defined Java environment. (On Windows, a reboot of the machine might be required.) Open a DOS command prompt on Windows, or a console on UNIX, and at the operating system prompt, enter the following command to validate the Java environment and return the version information (including bitness) for the installed package: **java -version**.

For more information about configuration steps for your Web application server, go to **http://support.sas.com/resources/thirdpartysupport/v93/appservers/index.html** and select the product name of your Web application server.

Consider Middle-Tier Topology Guidelines

Key to planning your SAS middle-tier deployment is understanding your middle-tier machine and operating system topology. Please refer to "Best Practices for Middle-Tier Configuration" in Chapter 2 of *SAS Intelligence Platform: Middle-Tier Administration Guide* for sample middle-tier topologies and guidelines for achieving better efficiency and performance with the middle-tier components in the SAS Intelligence Platform.

Review Web Application Server Configuration Documentation

SAS provides post-installation documentation that describes how to configure your Web application server. For example, some of the topics include information about how to run your Web application server on different ports, install SAS with one user account, install your Web application server with a different user account, and so on. For more information about configuration steps for your Web application server, go to **http://support.sas.com/resources/thirdpartysupport/v93/appservers/index.html** and select the product name of your Web application server.

Choose Whether to Automatically Configure Your Web Application Server

The SAS Deployment Wizard gives you the option of automatically building and configuring the SAS Web applications as well as configuring a Web application server for use with SAS 9.3. (To use this wizard feature, make sure that your Web application server is not running before you start the wizard. For WebSphere, it is necessary to stop all deployment manager servers, all node agent servers, and all application servers

before running the wizard. The one exception is on z/OS, where the WebSphere Web application server should be running.)

When the SAS Deployment Wizard configures the SAS 9.3 middle tier, by default, it automatically creates and configures an instance of a Web application server to host the SAS Web applications. The wizard creates a series of configuration files that enable you to run an instance of your Web application server with the SAS Web applications. The automatic configuration feature and the automatic deployment feature (described later) provide the opportunity to enable the automatic configuration of your Web application server, but not deploy the applications if you prefer to review the configuration to ensure it meets your site's needs. You can then deploy the SAS Web applications afterward.

Some of the configuration tasks performed by the SAS Deployment Wizard include setting options such as the following:

- HTTP ports

- optimized JVM options

- a mail session

- JAAS login modules for SAS services

- JMS queues

- a JDBC data source

Depending on the Web application server that you are using, the SAS Deployment Wizard modifies your Web application server configuration differently:

WebLogic
    makes no changes to the WebLogic installation directory. The deployment wizard creates a sample domain in the SAS configuration directory.

WebSphere
    creates deployment manager and application server profiles in the WebSphere installation directory.

    Note: On z/OS systems, the SAS Deployment Wizard cannot automatically create a server profile. You must do this manually. For more information, go to **http:// support.sas.com/resources/thirdpartysupport/v93/ appservers/index.html** and select "IBM WebSphere".

    Note: When installing SAS Enterprise BI server to use a WebSphere Base Server, make sure that you choose *not* to have the SAS Deployment Wizard automatically configure your Web application server.

JBoss
    creates a Web application server instance in the JBoss installation directory. The deployment wizard adds a start-stop script to the JBoss bin directory. JAR files for the SAS Drivers for JDBC are copied to the JBoss lib directory.

If you choose to disable this feature during SAS Deployment Wizard execution, the wizard generates instructions that describe how to perform these configuration steps manually after you finish running the wizard.

To disable the auto configuration feature, run the wizard using either the Typical or Custom prompting levels. For more information, see "Overview of Configuration Options by Prompt Level" on page 143 .

For samples of the instructions that describe how to manually configure your Web application server for SAS Web applications, go to the Third-Party Software Web site at **http://support.sas.com/resources/thirdpartysupport/v93/**

`appservers/index.html` and select the product name of your Web application server.

Choose Whether to Automatically Deploy the SAS Web Applications

In addition to the automatic configuration feature, the SAS Deployment Wizard offers a feature to automatically start the Web application server and deploy the SAS Web applications. (This feature is turned on by default.)

Regardless of whether you choose to automatically deploy your SAS Web applications, when building Web applications, the wizard also automatically explodes Web application archive files (.ear files).

Note: If you choose not to automatically deploy, you must also manually deploy your Web applications when applying maintenance in the future.

For more information, go to `http://support.sas.com/resources/thirdpartysupport/v93/appservers/index.html`.

To disable the auto deployment feature, run the wizard using either the Typical or Custom prompting levels. For more information, see "Overview of Configuration Options by Prompt Level" on page 143 .

Choosing not to automatically deploy your SAS Web applications means that you must also manually deploy your Web applications when you apply any future maintenance releases.

Building a Web Application Server Configuration for Deployment on Another Machine

Overview of Building a Web Application Server Configuration for Deployment on Another Machine

Some sites separate the administration of SAS applications and the administration of Web application servers. For these situations, the SAS Deployment Wizard enables the SAS administrator to create a middle-tier configuration on a machine that does *not* contain a Web application server. After the configuration is complete, the SAS administrator compresses the Web tier configuration and hands it off to his Web administrator counterpart to deploy on the target Web application server machine.

With the middle-tier configuration the Web administrator has two options:

• create the Web server configuration following local conventions and using the manual instructions (Instructions.html) that were generated during the SAS Web configuration

   For samples of the instructions that describe how to manually configure your Web application server for SAS Web applications, go to the Third-Party Software Web site at `http://support.sas.com/resources/thirdpartysupport/v93/appservers/index.html` and select the product name of your Web application server.

- install the SAS configuration scripting tools on the Web application server machine and then use the tools to perform the server configuration exactly as is done during a SAS automated Web tier configuration

  For more information, see Chapter 14, "SAS Configuration Scripting Tools," in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

If you choose to configure a middle tier for deployment on another machine, some additional deployment wizard prompts appear. These prompts include the JDK vendor type and paths to the JDK and Web application server installations on the target machine. If you know the host name and ports of the Web application server when you run the deployment wizard, you can minimize the amount of manual property editing later when the configuration scripting tools are moved to the target machine. You will also have to change some SAS metadata if host and port information changes. It is important to note that the target machine must be the same operating system and CPU type as the machine where the SAS middle tier is initially configured.

Topics in this section include:

- "Preparation for Configuring a Middle Tier" on page 66
- "Build a Middle-Tier Configuration for Deployment on Another Machine" on page 67

Preparation for Configuring a Middle Tier

To build a SAS middle-tier configuration for deployment on another machine, you need the following information:

- JDK installation directory path

- JDK version

- Web application server installation directory (for example: JBOSS_HOME, WL_HOME).

- Web application server version

- Fully qualified host name that contains the Web application server

- Ports on the Web application server machine to be assigned to the SAS managed servers. For deployments that use WebLogic Server, you need to know the node manager and administration server ports as well. For deployments that use WebSphere Application Server, you need to know the ports for the node agent and the deployment manager.

- For deployments that use WebLogic Server, you also need to know the following items:

  - Oracle MW_HOME directory

  - Directory path for the domain that you are creating

    Note: We recommend that you accept the default WebLogic domain pathname during SAS installation, and then use that same structure for the SASDomain on the Web application server machine. The default pathname that the SAS Deployment Wizard prompts you for is *configuration-directory***/Lev***n***/Web/ SASDomain**.

Build a Middle-Tier Configuration for Deployment on Another Machine

To build a SAS middle-tier configuration for deployment on another machine, follow these steps:

1. Make sure that you have access to the information identified in "Preparation for Configuring a Middle Tier" on page 66.

2. Start the SAS Deployment Wizard, using the command appropriate for your machine's operating system that is documented here: Table 5.1 on page 99.

3. Follow the instructions for running the deployment wizard documented in "Install and Configure SAS Interactively" on page 98.

4. When the Review Required Software page appears, be sure to select **The Web Application Server and the Java Development Kit will be installed on another machine**
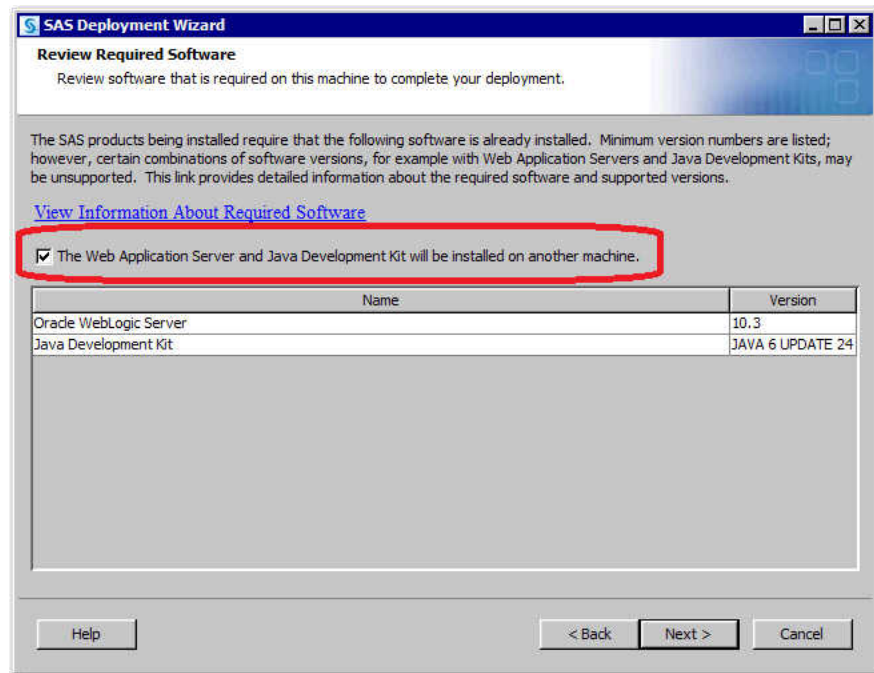
5. When prompted for the location to the required software, remember to enter the path on the target Web application server machine.

6. On the Select Configuration Prompting Level page, choose **Custom**.
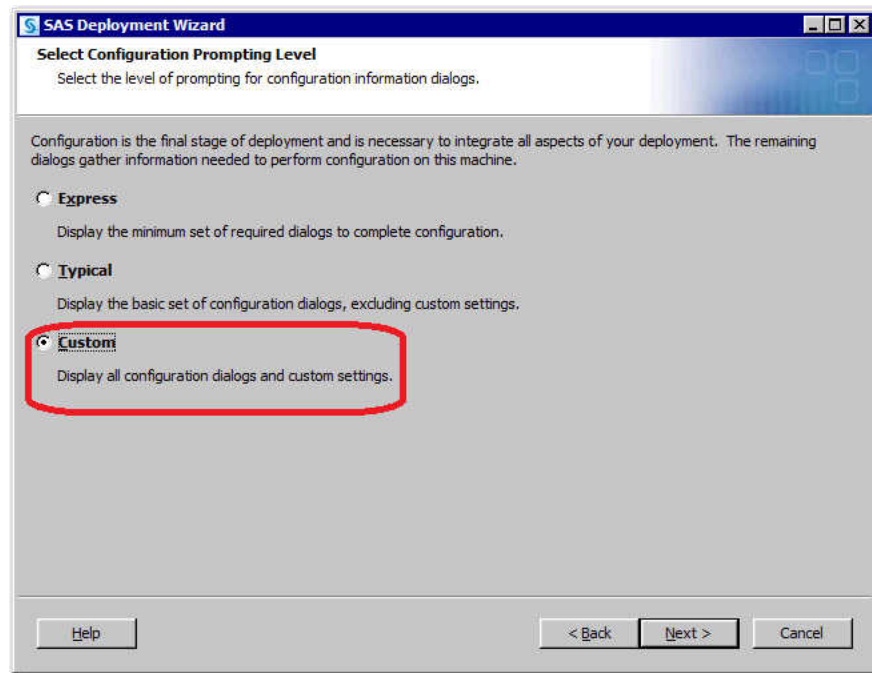
7. Consider the following as you provide information about the various deployment wizard pages:

   If you are configuring multiple SAS tiers, you can reduce the number of prompts that you will need to edit later by changing the host names on the Local Machine Name panel to the machine where the application server resides. If you do this, all the products with host name prompts will display this machine as the default. There are several products, including SAS Remote Services Application and SAS Deployment Tester, that you will configure on the local machine, so you will have to change these back when you get to those wizard pages. If you are doing a single tier configuration, it is probably best to change the host name for each Web application that prompts for one, because there are many more SAS products on the foundation tier that require a host name. Be sure to enter all of the values collected in "Preparation for Configuring a Middle Tier" on page 66.

8. When the deployment wizard is finished, you have to collect the *entire* configuration in order to move it to the Web application server machine. Be sure to bundle the following directories:

   • Scripting, SAS EAR, and Log configuration directory: *SAS-configuration-directory***/Levn/Web**

   • SAS Web application configuration: *SAS-configuration-directory***/Levn/ AppData**

   Note: Remember that when you apply maintenance or add software updates, you must move the Web directories back to the original machine, apply your SAS maintenance and updates, and then finally move the updated Web directories back to the target Web application server machine.

9. Hand off the compressed SAS middle-tier configuration to the Web administrator and refer him to the following topic for more information: Chapter 14, "SAS Configuration Scripting Tools," in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

   Note: Remember the fully qualified path of the directories that you package, because these directories must be located in the exact same path on the Web application server machine.

10. After the Web application server has been configured on the target machine, you must follow the post-configuration steps documented in the Instructions.html file. One of these steps requires you to run a script on the machine where the SAS deployment Wizard was run. This script requires you to set the JDK_HOME environment variable in the following script: *SAS-configuration-directory***/Lev1/level_env.sh** (**level_env.bat** on Windows). For more information, see Chapter 14, "SAS Configuration Scripting Tools," in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Install Third-Party Products Using the SAS Software Depot

Some third-party products are shipped with SAS 9.3. Such products' installation files and documentation are located in the SAS Software Depot under the **third_party** directory.

Figure 4.1   A third_party Subdirectory in the SAS Software Depot
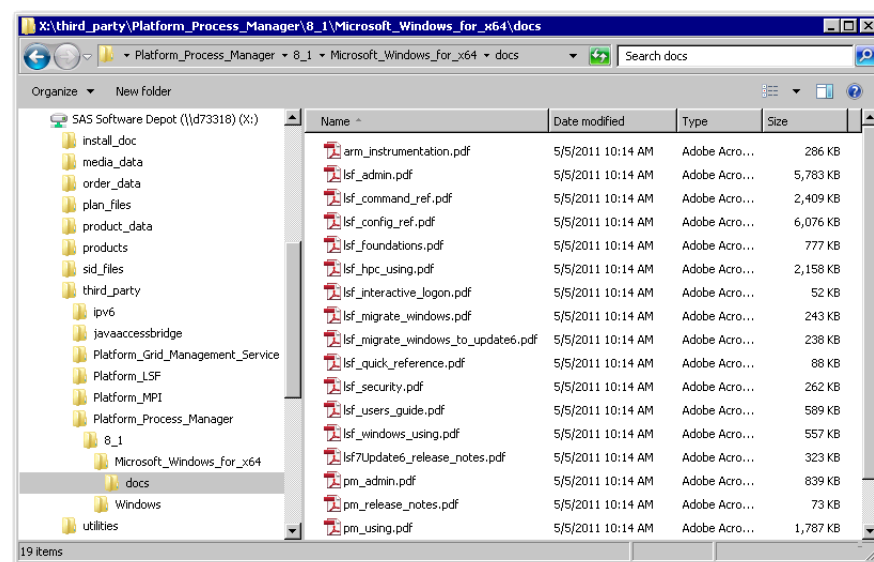
Platform Suite for SAS is an example of one third-party application that you install in this way. To determine whether any of your third-party software is distributed with your order, refer to your *SAS Software Summary* that resides in your SAS Software Depot in your *order_number* directory under **install_doc**. For example:

C:\SAS Software Depot\install_doc*order_number***\ordersummary.html**

Some third-party software can be obtained from the Web site that SAS maintains. For more information, see "Install Third-Party Products Using the Software Web Site" on page 70 .

Install Third-Party Products Using the Software Web Site

SAS maintains a third-party software Web site to help you do the following:

- determine what version of the product to install

- obtain the product, if you do not already have it

- find installation instructions

- learn about any patches required

Note: Some third-party software is shipped with your SAS order. For more information, see "Install Third-Party Products Using the SAS Software Depot" on page 69 . If you are installing Platform Process Manager, Platform LSF, or Platform Grid Management Service, you must use the installation instructions and installation programs provided in your SAS order. For more information, see "Installing Platform Suite for SAS" on page 70 .

To install the Java Development Kit or a Web application server, complete these steps:

1. Go to the Third-Party Software Web site at **http://support.sas.com/ resources/thirdpartysupport/v93**.

2. Select the link for the product (or type of product) that you are installing.

   There are columns that either have links directly to the vendor's site, or an indication that the third-party software is shipped with SAS.

3. Install the product.

   For most installations, you can use the instructions provided by the vendor. For products that are more complex to install (such as the Web application servers), the Third-Party Software Web site contains links to brief installation instructions. These instructions are not meant to replace the vendor documentation. However, they will enable you to create a simple configuration that will work well with your SAS software.

Note to users in Russia: SAS cannot export the Java Runtime Environment (JRE) to Russia. You will need to locate the appropriate link on the Third-Party Software Web site and download the JRE. Install it in the default location, and it will be ready for use when you install your SAS software.

Installing Platform Suite for SAS

Overview of Installing Platform Suite for SAS

This section discusses Platform Suite for SAS. Specifically, these topics are covered:

- "What Is Platform Suite for SAS?" on page 71

- "Where to Install Platform Suite for SAS" on page 71

- "Install Platform Suite for SAS" on page 71

What Is Platform Suite for SAS?

If you will use products from Platform Computing Incorporated either for scheduling or for grid computing, you must install several of the products from the Platform Suite for SAS offering. Platform Suite for SAS includes three products:

Platform Process Manager
  provides scheduling capabilities. Process Manager submits jobs to Platform LSF and manages dependencies between jobs.

Platform LSF (Load Sharing Facility)
  manages resource requirements and provides for load balancing.

Platform Grid Management Service
  includes a monitoring daemon that enables administrators to monitor the load on machines running Platform LSF.

Where to Install Platform Suite for SAS

If you are interested in using the Platform Suite for SAS to perform scheduling tasks for objects like SAS Data Integration Studio jobs or SAS Web Report Studio reports, then you must install Platform Process Manager on the machine that you want to use as your scheduling server. When you install Platform Process Manager, Platform LSF will be installed as well.

If you will be using the Platform Suite for SAS for grid computing, you must install Platform LSF and the Platform Grid Management Service. If you want to schedule jobs to run on the grid, you must install Platform Process Manager as well. For information about where to install each of these products, see "SAS Grid Topology" in Chapter 1 of *Grid Computing in SAS*.

Install Platform Suite for SAS

Platform Suite for SAS is distributed with SAS. You install these products directly from the SAS Software Depot, using the installation instructions and installation programs that reside in your depot under the **third_party** directory.

You can also find the Platform Suite for SAS installation instructions on the SAS Scalability and Performance focus area on the Web at **http://support.sas.com/rnd/scalability/platform/index.html**.

Pre-installation Checklists for Third-Party Products

Overview of Pre-installation Checklists for Third-Party Products

As you install third-party products, print and fill out the appropriate third-party software checklists.

Note: You must have the necessary third-party software installed on the current machine, or the utility that you use to deploy SAS, the SAS Deployment Wizard, will not let you complete your SAS deployment.

This section contains checklists for the following third-party products:

Java Access Bridge

The Java Access Bridge (JAB) is a prerequisite for JAWS, the Windows accessibility solution. JAB is shipped with SAS 9.3. For more information, see **http:// support.sas.com/resources/thirdpartysupport/v93/othersw.html**.

JUnit

JUnit is an open-source software testing framework for Java, and the de facto standard for writing unit and regression tests. Some of the validation tests shipped with SAS products run under the SAS Deployment Tester framework and require JUnit. For more information about JUnit version requirements, go to **http://support.sas.com/ resources/thirdpartysupport/v93/othersw.html**.

Java Development Kit (JDK)

For more information about JDK version requirements, go to **http:// support.sas.com/resources/thirdpartysupport/v93/jdks.html**.

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at **http://support.sas.com/installcenter/plans**. This Web site also contains a corresponding deployment plan and an architectural diagram.

Table 4.1 *Java Development Kit*

Description	Default Value	Actual Value
Product version	Dependent on the Web application server and the operating system.[*] See **http://support.sas.com/ resources/thirdpartysupport/ v93/**.	
Installation directory	Not applicable	

[*] SAS 9.3 supports JRockit as an alternative JDK for WebLogic. For more information, see **http:// support.sas.com/resources/thirdpartysupport/v93/jdks.html**.

WebLogic Server

For more information about pre- and post-installation configuration steps for the Oracle WebLogic Server, go to **http://support.sas.com/resources/ thirdpartysupport/v93/appservers/weblogicsw.html**. To change the default port, you must use the SAS Deployment Wizard **Typical** or **Custom** prompting level. For more information, see "Overview of Configuration Options by Prompt Level" on page 143.

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at **http://support.sas.com/installcenter/plans**. This Web site also contains a corresponding deployment plan and an architectural diagram.

Table 4.2 *WebLogic Server*

Description	Default Value	Actual Value
Product version	10.3	
Installation directory	Not applicable	
Name of domain	SASDomain	
Name of managed servers	SASServer1, SASServer2, and so on	
WebLogic Nodemanager port	5556 (inbound and outbound)	
Non-secure listen port for managed servers	7001, 7101, (inbound and outbound) (additional managed servers increment by 100)	
Secure listen port for managed servers	7002, 7102, (inbound and outbound) (additional managed servers increment by 100)	
Listen port for administration server	7501 (inbound and outbound)	

WebSphere Application Server

For more information about pre- and post-installation configuration steps for the IBM WebSphere Application Server, go to **http://support.sas.com/resources/ thirdpartysupport/v93/appservers/webspheresw.html**. To change the default port, you must use the SAS Deployment Wizard **Typical** or **Custom** prompting level. For more information, see "Overview of Configuration Options by Prompt Level" on page 143.

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at **http://support.sas.com/installcenter/plans**. This

Web site also contains a corresponding deployment plan and an architectural diagram.

Table 4.3 *WebSphere Application Server*

Description	Default Value	Actual Value
Product version	7.0	
Name of application servers	SASServer1, SASServer2, and so on	
Profile name for managed nodes (contains node agent and Web application server)	SAS*local-hostname*01, SAS*local-hostname*02, and so on	
Node name for managed nodes	SAS*local-hostname*01Node, SAS*local-hostname*02Node, and so on	
Profile name for deployment manager	SASDmgr01 (on z/OS, DEFAULT)	
Cell name for deployment manager	SASDmgr01Cell	
Node name for deployment manager	SASDmgr01Node	
SOAP port for administrative console	8879 (inbound and outbound)	
SOAP ports for application servers	8880, 8881 (inbound and outbound) (additional application servers increment by one)	
Secure HTTPS port for administrative console	9043 (inbound)	
Secure HTTPS ports for application server	9044, 9045 (inbound) (additional application servers increment by one)	
Non-secure HTTP port for administrative console	9060 (inbound)	
Non-secure HTTP ports for application server	9080, 9081, (inbound) (additional application servers increment by one)	
RMI port for administrative console	9809 (inbound and outbound)	

Description	Default Value	Actual Value
RMI ports for application servers	9811, 9812, (inbound and outbound) (additional application servers increment by one)	
WebSphere Portal Server (WPS) listening port	10040 (inbound and outbound)	

JBoss Application Server

For more information about pre- and post-installation configuration steps for the JBoss Application Server, go to **http://support.sas.com/resources/thirdpartysupport/v93/appservers/jbosssw.html**. To change the default port, you must use the SAS Deployment Wizard **Typical** or **Custom** prompting level. For more information, see "Overview of Configuration Options by Prompt Level" on page 143.

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at **http://support.sas.com/installcenter/plans**. This Web site also contains a corresponding deployment plan and an architectural diagram.

Table 4.4 *JBoss Application Server*

Description	Default Value	Actual Value
Product version	4.3	
Name of managed servers	SASServer1, SASServer2, and so on	
RMI port for managed servers	1099, 1199, (inbound and outbound) (additional managed servers increment by 100)	
Listen port for managed servers	8080, 8180, (inbound and outbound) (additional managed servers increment by 100)	
Secure listen port for managed servers	8443, 8543, (inbound and outbound) (additional managed servers increment by 100)	

Platform Suite for SAS

For more information about Platform Suite for SAS version requirements, go to **http://support.sas.com/resources/thirdpartysupport/v93/othersw.html#tab_plat**.

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at **http://support.sas.com/installcenter/plans**. This Web site also contains a corresponding deployment plan and an architectural diagram.

Table 4.5 *Platform Suite for SAS*

Description	Default Values	Actual Values
Platform Process Manager port	1966 (inbound)	
Product version	8.1	
Platform LSF ports	6878, 6881, 6882, 7869, 7870, 7871, 7872 (inbound)	
Product version	7.06	
Platform Grid Management Service port	1976 (inbound)	
Product version	7.11	

Chapter 5
Installing and Configuring Your SAS Software

Overview of Installing and Configuring Your SAS Software

This chapter describes how to use the SAS Deployment Wizard to install and configure all of the SAS software components called for in your deployment plan on each host in your environment.

Installing and configuring SAS is the fifth and final step in deploying SAS.

1. Review additional documentation.

2. Create operating system users and groups and designate ports.

3. Create a SAS Software Depot.

4. Install required third-party software.

⇨ **5. Install and configure SAS.**

Preparing to Install and to Configure

Overview of Preparing to Install and to Configure

The topics contained in this section are:

SAS Deployment Wizard Options

The *SAS Deployment Wizard* is a cross-platform utility that installs and configures many SAS products. Using a SAS installation data file (SID file) and a deployment plan (plan.xml) for its initial input, the wizard is designed to prompt the customer for all of the remaining input at the start of the session so that the customer does not have to monitor an entire deployment.

There are two major ways that you can run the SAS Deployment Wizard:

• interactively

This is a standard method of providing input via fields on wizard pages with a Back and Next button navigation method. You can choose from three levels of configuration prompting: Express (minimum set of prompts), Typical (basic set of prompts), and Custom (all prompts). For more information, see "Install and Configure SAS Interactively" on page 98.

• non-interactively

A record and playback feature enables you to automate a SAS installation for use on multiple machines. This feature is designed for large-scale enterprise deployments to prevent users from having to manually provide input on every page each time the SAS Deployment Wizard is run on a machine. For more information, see "Automating the SAS Installation on Multiple Machines" on page 124.

About Deployment Plans

A *deployment plan* describes what software should be installed and configured on each machine in a SAS deployment. A deployment plan is an XML file that is used as input to the SAS Deployment Wizard. There are two types of deployment plans: standard and custom. A standard deployment plan describes a common configuration. Standard deployment plans are included in the SAS Software Depot. A custom deployment plan is created by a SAS representative specifically for a site.

• If a SAS representative created a custom deployment plan for you, an XML file (or a ZIP file containing an XML file) will have been e-mailed to you.

• If your SAS representative recommended that you use a standard deployment plan, you just need the name of the plan that you will use; the actual deployment plan is downloaded with your SAS custom order (or included in your custom media that is shipped to you). During the installation, the standard deployment plan will be available from a drop-down list in the SAS installation program.

• Your deployment plan must be a valid SAS 9.3 plan. The SAS Deployment Wizard does not accept plans from earlier SAS releases.

At the end of the SAS deployment, the SAS Deployment Wizard makes a copy of the deployment plan that it used. The deployment plan can be helpful when you want to add another SAS product or change your SAS configuration. The wizard stores a copy of the deployment plan in the SAS configuration directory in the utilities directory, and inserts a date and time stamp to the deployment plan filename. For example:

`C:\SAS\Config\Lev1\Utilities\plan.2011-07-17-11.04.xml`

To download the latest SAS 9.3 standard deployment plans that also contain a corresponding architectural diagram and pre-installation checklist, go to **`http://support.sas.com/installcenter/plans`**.

About SAS Hot Fixes

In the second maintenance release for SAS 9.3, the SAS Download Manager automatically downloads the necessary SAS hot fixes required by the SAS products in your initial order. This enhancement makes the following possible:

- Your SAS software is up-to-date with hot fixes deemed critical by SAS Technical Support after your initial deployment. You avoid the multi-step process of deploying software and then having to immediately update it with hot fixes.

- The SAS Deployment Wizard applies hot fixes prior to the configuration phase. You no longer have to reconfigure products immediately after their initial configuration.

For a list of the hot fixes that the deployment wizard installs, click the link on the wizard's Additional Resources page.

Display 5.1   *Additional Resources Page*
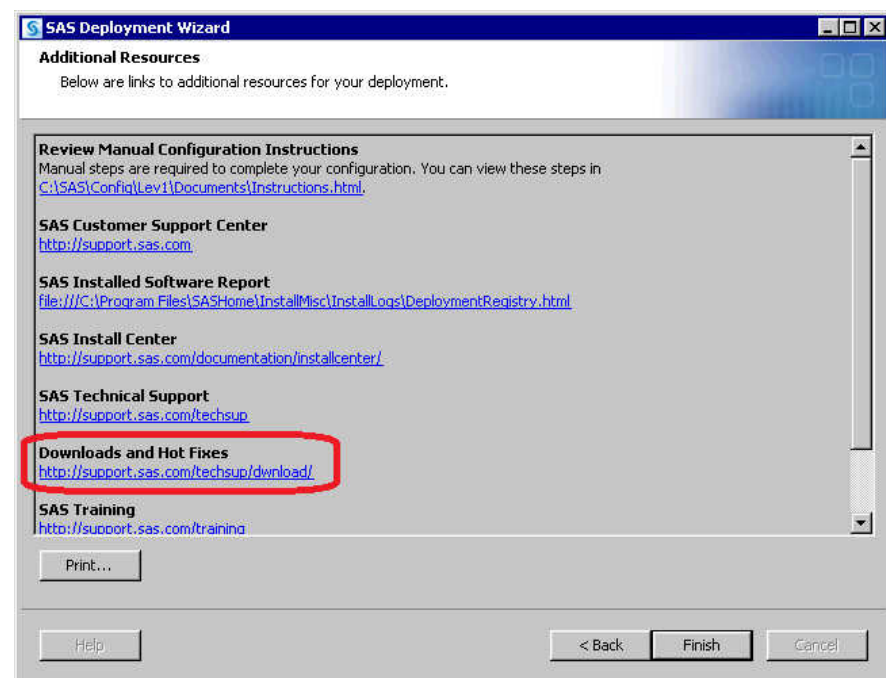
Installing SAS on z/OS

Installing the SAS Intelligence Platform on z/OS consists of two major steps:

1. Run the SAS Deployment Wizard to first install the SAS Metadata Server as a 64-bit application.

   For more information, see Start Up Commands for the SAS Deployment Wizard on page 99.

2. Run the SAS Deployment Wizard a second time to install the remainder of your SAS 9.3 order as a 31-bit application.

Note: If you are updating a deployment that runs on z/OS, you must update the deployment in the same order that you installed SAS in your initial deployment.

Before you can start the SAS Deployment Wizard, the cell where you are going to perform the software upgrade must be running.

For more information, see: **http://support.sas.com/documentation/ installcenter/93/mvs/index.html**.

Starting with the March 2012 release of SAS 9.3, the deployment wizard can be run on operating systems that do not have windowing systems. For more information, see the *SAS Deployment Wizard and SAS Deployment Manager User's Guide*, available at: **http://support.sas.com/documentation/installcenter/en/ ikdeploywizug/64204/PDF/default/user.pdf**.

Installation Order Rules for Multiple Machine Deployments

Be aware that if you are deploying SAS on a multiple-machine, distributed system, you must install software on your computers in a particular order:

- *Always* install SAS software on the metadata server machine first.

- Install the SAS application servers (such as workspace or stored process servers) on machines other than the metadata server machine.

- Install the middle tier with SAS Foundation Services (that is, Remote Services).

- For SAS deployments where the metadata server and middle tier reside on the same machine, remember that the SAS server tier (the compute tier) must be configured *after* the metadata server and *before* the middle tier.

- Install the middle tier with SAS Web Infrastructure Platform

- Install the middle tier with other Web applications (such as SAS BI Dashboard, SAS Web Report Studio, and so on).

- Install software on machines that will host only clients last.

SAS Installation Directory (SAS Home) Considerations

Although your SAS Home and SAS configuration directories can share the same parent directory, one directory should not reside inside another. Defining the configuration directory under the SAS Home directory, or vice versa, can lead to file permission issues arising from the need to manage installed files differently than site-specific configurations.

CAUTION:
Users running SAS on 64-bit Linux machines must keep any 32-bit SAS Foundation products in a separate installation directory (SAS Home). Intermixing 32-bit SAS Foundation products with 64-bit SAS products in the same SAS Home location is not supported and might cause SAS to run improperly.

Note: SAS Home should *not* be a directory within your SAS Software Depot.

Note: On z/OS, the length of the SAS Home path cannot exceed 54 characters.

SAS Metadata Server Recommendation

We recommend that you deploy the SAS Metadata Server on a dedicated server machine. A machine running only the metadata server greatly simplifies tuning, management, and diagnostics.

For more recommendations, see the SAS Metadata Server section in the System Requirements document for your SAS product.

Content Repository Considerations

Before deploying SAS 9.3, consider where certain content repositories will reside:

- SAS Framework Data Server

  If you are deploying the SAS Framework Data Server, then the SAS configuration path should be a path local to the machine. The configuration path should not be on an NFS shared disk. If you want to put your configuration path on a shared disk, then you must make sure that you specify a local path for the data framework server content directory. Setting the data framework server content directory path is possible only on the SAS Deployment Wizard custom configuration prompting level. For more information, see "Overview of Configuration Options by Prompt Level" on page 143 .

- SAS Metadata Server

  We recommend that your metadata repositories reside either on a local file system or a high-performance, high-availability network file system. For more information about metadata repositories, see "About SAS Metadata Repositories" in Chapter 16 of *SAS Intelligence Platform: System Administration Guide*.

Locale and Encoding Considerations

The SAS Deployment Wizard enables you to select the default locale and languages for the SAS Deployment Wizard and for SAS 9.3. (A separate tool, the SAS Locale Setup Manager, enables you to configure the locale of SAS Java clients. For more information, see "Locale Setup Manager" on page 84.)

One of the first dialog boxes in the deployment wizard is the Choose Language dialog box.

Display 5.2   Choose Language Dialog Box
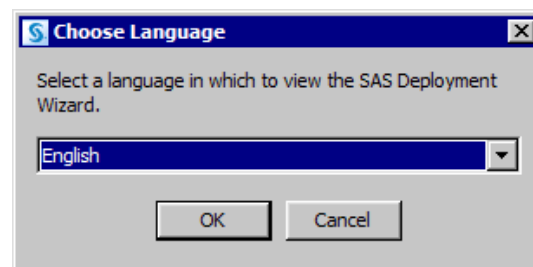
The language that you select in the Choose Language dialog box causes two actions:

- indicates the language that the deployment wizard uses to display text

- specifies the language that the SAS Metadata Server uses to store objects in its repository

Further into the deployment wizard, you have an opportunity to set the language that your SAS 9.3 products support.

Display 5.3 *Select Language Support Page*
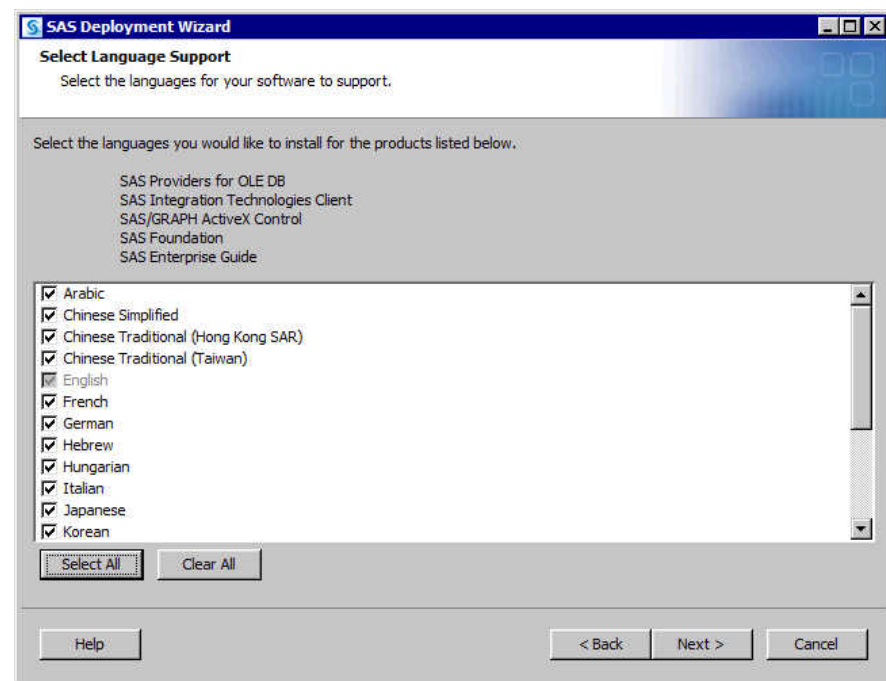
And finally, the deployment wizard prompts you for your locale settings.

Display 5.4 *Select Regional Settings Page*
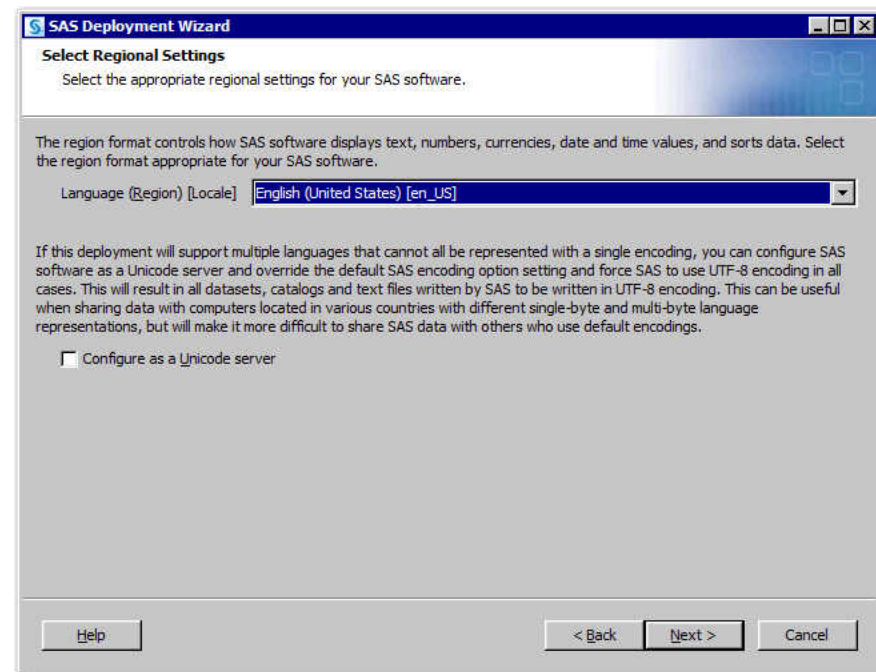
The locale (or regional) setting controls how SAS 9.3 displays the following:

- text

- numbers

- currencies

- dates

- times

- data (sorting)

On Windows and UNIX machines, you can choose to configure SAS 9.3 as a Unicode server. Unicode can be particularly useful when your SAS deployment supports multiple languages. Choosing to make SAS a Unicode server means that SAS writes all of its data sets, catalogs, and text files in UTF-8 encoding. UTF-8 encoding supports both single- and double-byte character sets. However, UTF-8 can make data sharing with SAS sites that use default encodings problematic.

CAUTION:
> **The SAS automated deployment tools do not support changing locale after SAS is initially deployed. For example, you cannot initially deploy SAS as English (US), and then reconfigure SAS with the SAS Deployment Manager and change the locale to French.**

For single-byte character set languages, the chosen locale is set in the configuration file that matches the default language and also in the English configuration file. For example, if you choose fr_FR, this value is added to both the French and English configuration files.

For double-byte character set languages, the chosen locale is set in the configuration file that matches the default language and English (US) is set as the default locale for English (SBCS), with some exceptions.

When a locale is set, a default encoding is used for that locale and the operating system.

For more information about locales and encodings, see the *SAS National Language Support (NLS): Reference Guide*.

Locale Setup Manager

On Windows machines, you can use the SAS Locale Setup Manager (LSM), to configure the locale of SAS Java clients. With the LSM, you can do the following:

- select the user interface language after installation

- disable partial localization

- select the client's locale

You run the LSM from the Windows Start menu (**Start ⇨ All Programs ⇨ SAS ⇨ SAS Locale Setup Manager 3.1**). For more information about how to use the LSM, see its online Help.

For more information about locales, see "Locale and Encoding Considerations" on page 82.

How the Deployment Wizard Names SAS Web Application Servers

The SAS Deployment Wizard creates multiple SAS Web application servers as needed, based on the products in your SAS order. By default, each SAS Web application is assigned to a specific server for deployment. This distribution helps balance the load on each server, and defines a recommended number of servers based on the products in each configuration.

Most of the time, the deployment wizard numbers these servers sequentially (for example, SASserver1, SASserver2, and SASserver3). However, depending on your

particular SAS product order, the default application server names might not be named sequentially.

If you use the default names (for example, **SASserver***n*) in your configuration, then we recommend that you also maintain the default numbering scheme.

Reviewing Third-Party Database Requirements

SAS enables you to use a database other than the SAS Framework Data Server to store SAS Web Infrastructure Platform data. (The SAS Deployment Wizard gives you this option when you choose the Typical or Custom prompting levels.) In SAS 9.3, the following third-party databases are supported:

• DB2

• MySQL

• Oracle

• PostgresSQL

• SQLServer

Third-party databases often have particular requirements that you need to know about, such as database name limits, minimum tablespace sizes, and so on. If you have not already, make sure that you review "Configuring an Alternative Database for SAS Web Infrastructure Platform Services," available at: **http://support.sas.com/ resources/thirdpartysupport/v93/appservers/ SharedServicesAlternativeDatabase.pdf**.

IPv6 Windows Machines That Communicate with SAS Foundation Servers

If the machine that you are deploying SAS on matches these characteristics:

• uses IPv6 (Internet Protocol version 6)

  Note: For more information, see "Designating Ports and Multicast Addresses" on page 20.

• runs Windows

• communicates with the SAS Foundation Server tier

then you must perform your SAS 9.3 deployment in the following manner:

1. Run the SAS Deployment Wizard in install mode.

   Begin following the directions for running the wizard. Early in the process, when the Select Deployment Type page appears, make sure that the Configure SAS Software check box is *not selected*. For more information, see "Install and Configure SAS Interactively" on page 98.
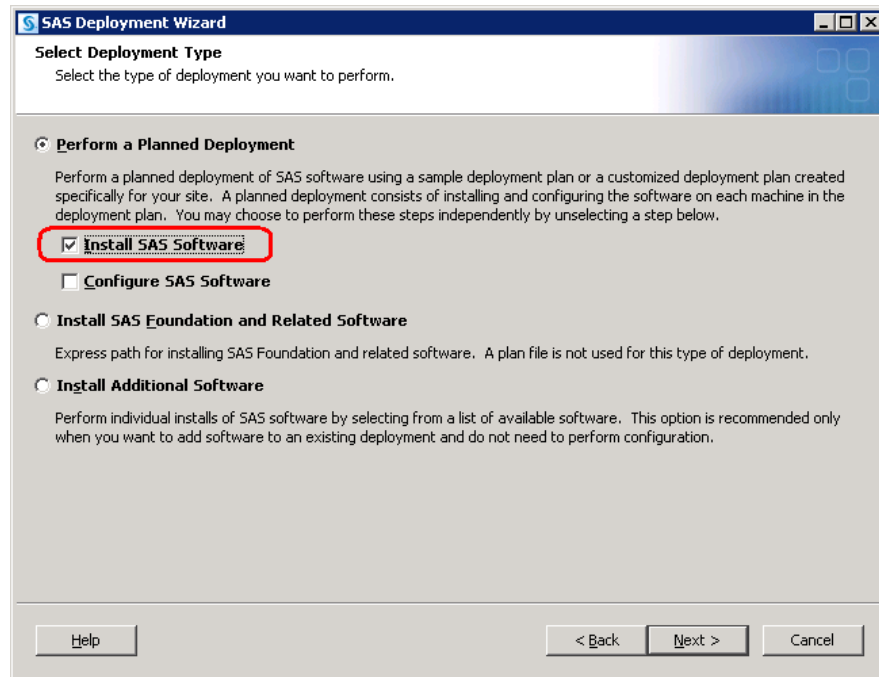
2. After the installation phase has completed, copy the following JAR file from your SAS Software Depot to the machine's JRE **ext** directory:

   *depot-install-directory***\thirdparty\ipv6\sas.nioc.channels.jar**

   For example:

   ```
   copy C:\SAS Software Depot\thirdparty
   \ipv6\sas.nioc.channels.jar C:\Program
   Files\Java\jre1.5.0_15\lib\ext
   ```

3. Add the following JVM start-up options to your Web application server start-up script:

   ```
   -Djava.net.preferIPv4Stack=false
   ```

   ```
   -Djava.net.preferIPv6Addresses=true
   ```

   By default, the script is named **SASServer1.bat** and resides in your Web application server configuration directory. For information about how to manually configure your Web application server for SAS Web applications, go to the Third-Party Software Downloads site at:**http://support.sas.com/resources/ thirdpartysupport/v93/appservers/index.html** and select the product name of your Web application server.

4. Rerun the SAS Deployment Wizard in configure mode to complete your SAS 9.3 deployment.

   Begin following the directions for running the wizard. Early in the process, when the Select Deployment Type page appears, make sure that the Install SAS Software check box is *not selected*. For more information, see "Install and Configure SAS Interactively" on page 98.
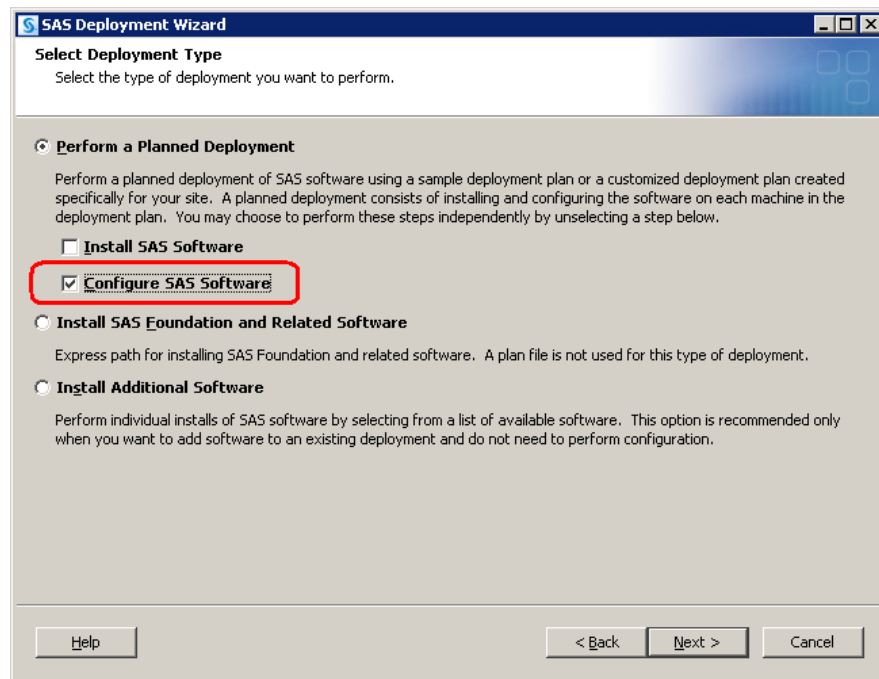
Deploy SAS BI Lineage When LSF Scheduler Is on a Separate Machine from the Workspace Server

The most common topology involving the Load Sharing Facility Scheduler (LSF Scheduler) is to locate it on the same machine as the SAS workspace server.

However, an alternative topology could consist of the following:

• Machine 1 hosts the metadata and workspace servers.

• Machine 2 hosts the LSF Scheduler and BI Lineage Scheduling servers.

To achieve this configuration, you run the deployment wizard twice: first on machine 1 and then on machine 2.

To deploy the SAS BI Lineage Scheduling Server when the LSF Scheduler is installed on a separate machine from the SAS workspace server, follow these steps:

1. When running the SAS Deployment Wizard on machine 1, the metadata and workspace server machine, make sure that you deselect **SAS BI Lineage Scheduling Server** on the Select Product to Install page.

   For information about how to run the deployment wizard, see "Install and Configure SAS Interactively" on page 98.
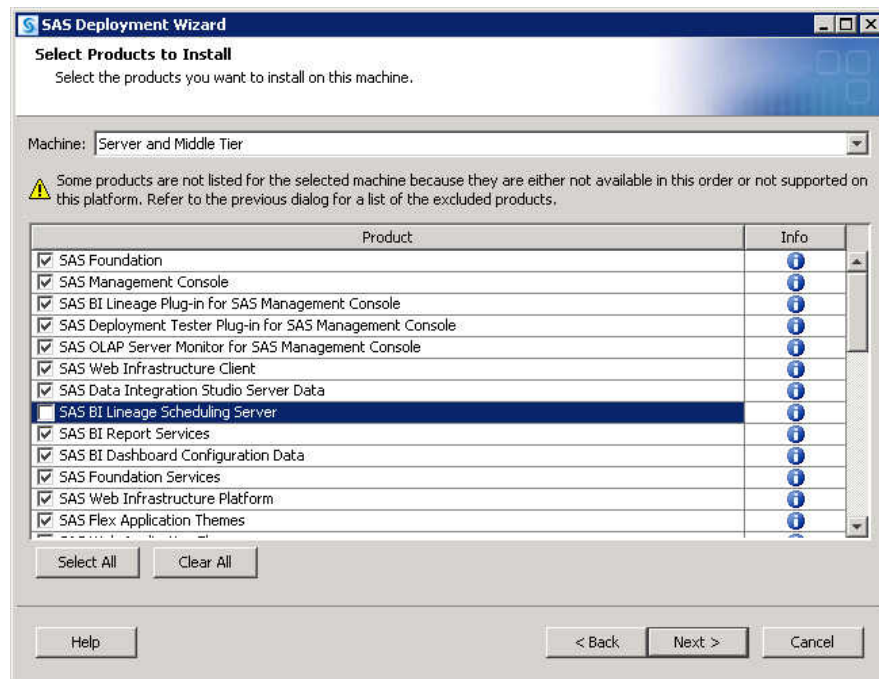
2. On the Select Configuration Prompting Level page, select **Custom** for the prompting level.
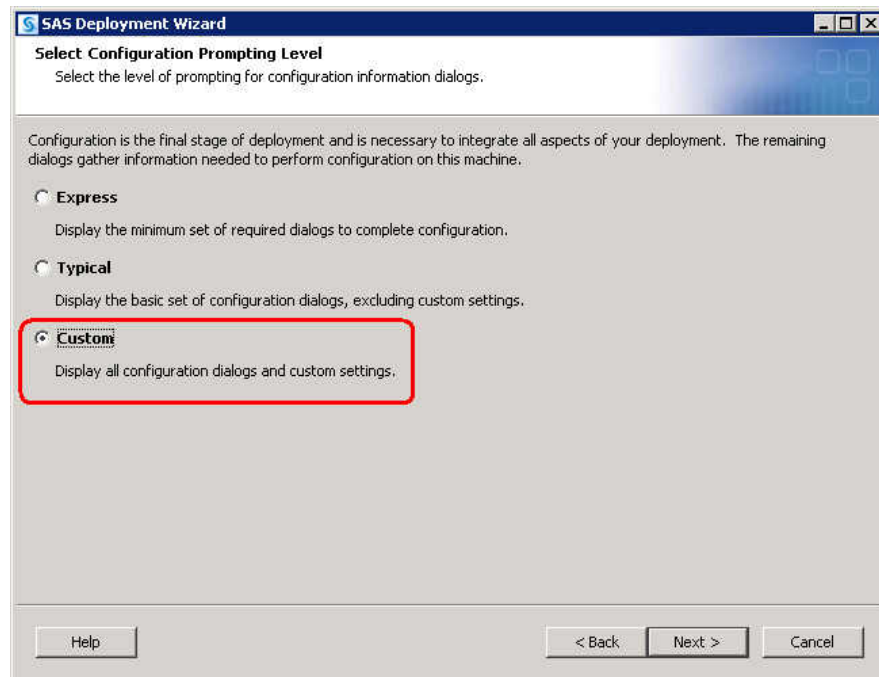
3. On the Select Products to Configure page, deselect the following:

  • **Platform Process Manager**

  • **SAS BI Lineage Scheduling Server**
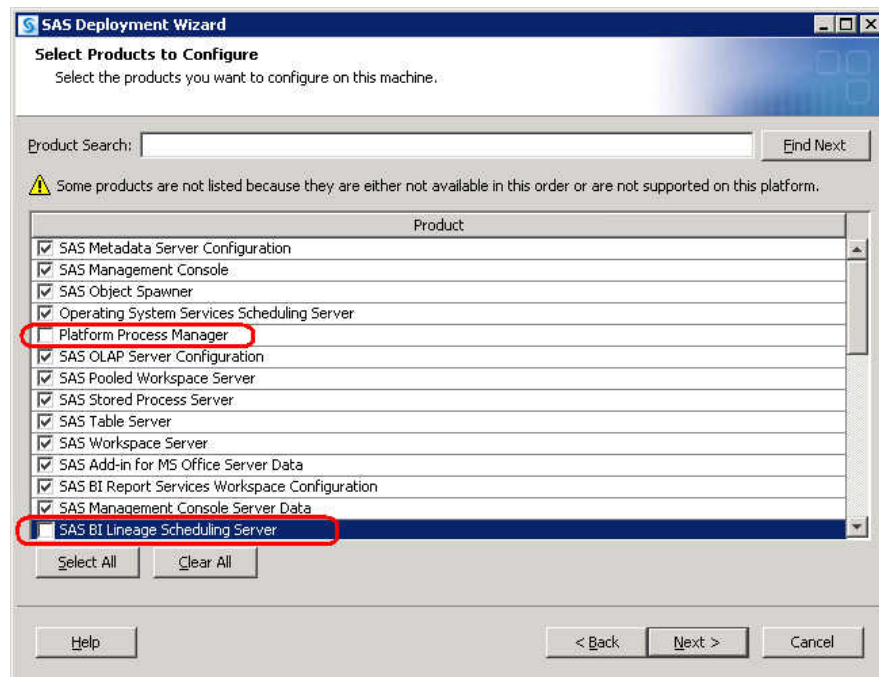
4. On the SAS Web Report Studio: Scheduling page, deselect **Enable Scheduling**.
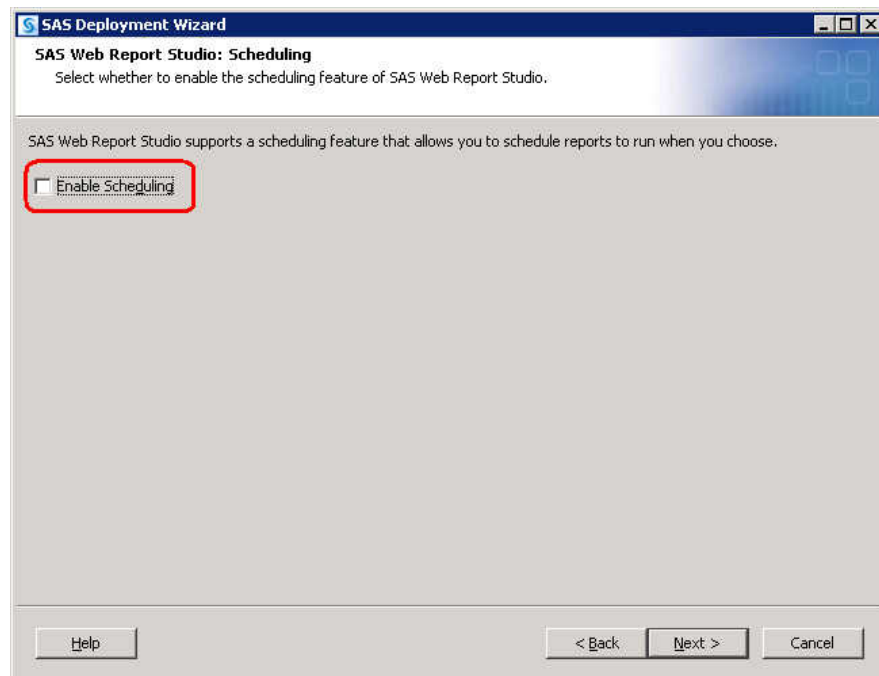
5. Answer the remaining deployment wizard prompts.

    The wizard will install and initially configure machine 1 based on the input that you have provided.

6. After the wizard completes running on machine 1, back up your metadata repository and your SAS configuration directory before you run the SAS Deployment Wizard on the next machine called for by your deployment plan.

    • Make a backup copy of your SAS 9.3 configuration directories by using your site-approved method. Your SAS configuration directories are all the child

directories beneath the path that you specified earlier in this procedure on the Specify Configuration Information wizard page.

- Back up your Web application server directories.

- Back up your metadata repository and repository manager on the SAS Metadata Server machine. For more information, see Chapter 11, "Best Practices for Backing Up and Restoring Your SAS Content," in *SAS Intelligence Platform: System Administration Guide*.

7. Be sure to restart any servers that you stopped for purposes of creating a backup.

8. When you are finished completing any manual configuration tasks called for in Instructions.html, and you have made the necessary backups, log on to machine 2 (the BI Lineage Scheduling and LSF Scheduler servers machine) and launch the wizard a second time.

   For information about how to run the deployment wizard, see "Install and Configure SAS Interactively" on page 98.

9. Use the same deployment plan and again select the **Server and Middle Tier** machine when prompted for products to install.
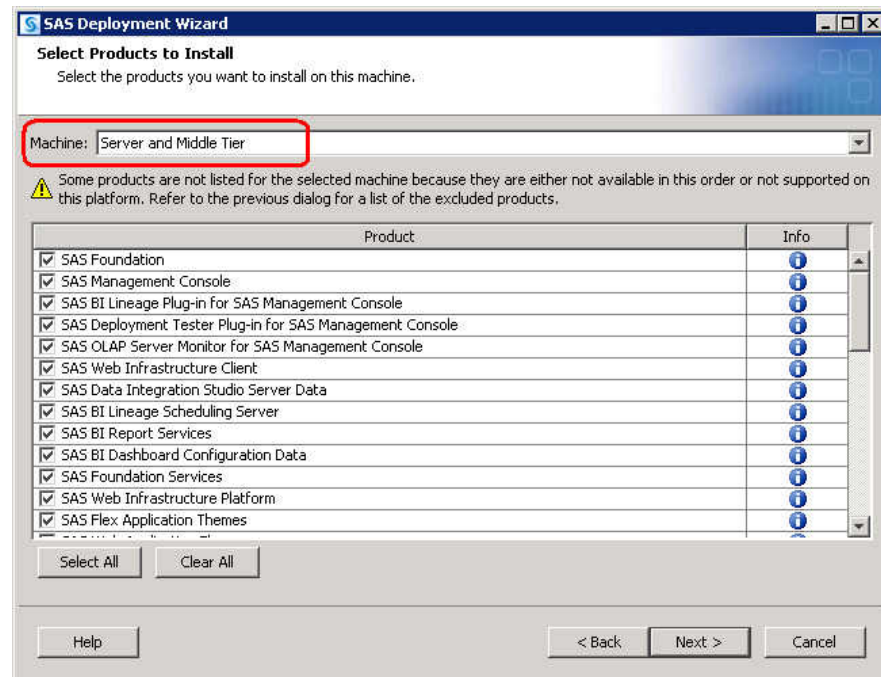
10. Select only the following products to install:

- SAS Management Console

- SAS BI Lineage Plug-in for SAS Management Console

- SAS BI Lineage Scheduling Server

- SAS Intelligence Platform Object Framework (not pictured).
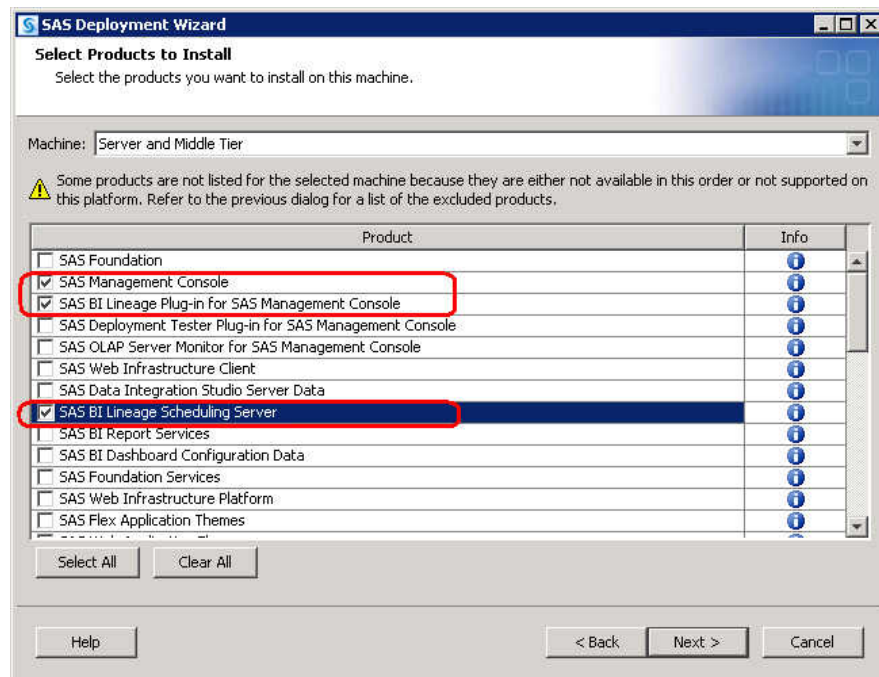
11. On the Select Configuration Prompting Level page, select **Custom** for the prompting level.
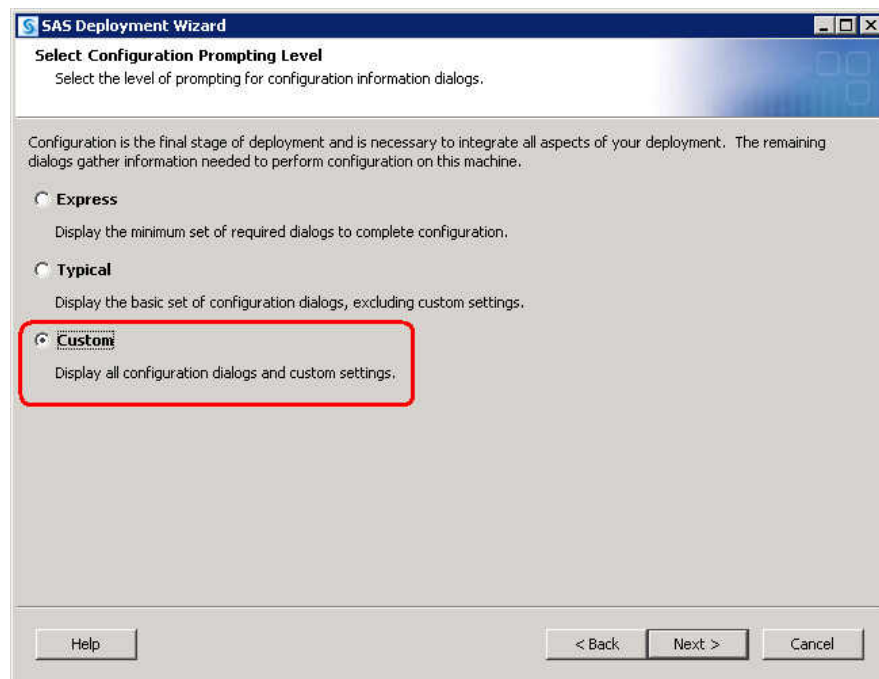
12. On the Select Products to Configure page, select only the following products:

- SAS Management Console

- Platform Process Manager

- SAS BI Lineage Scheduling Server
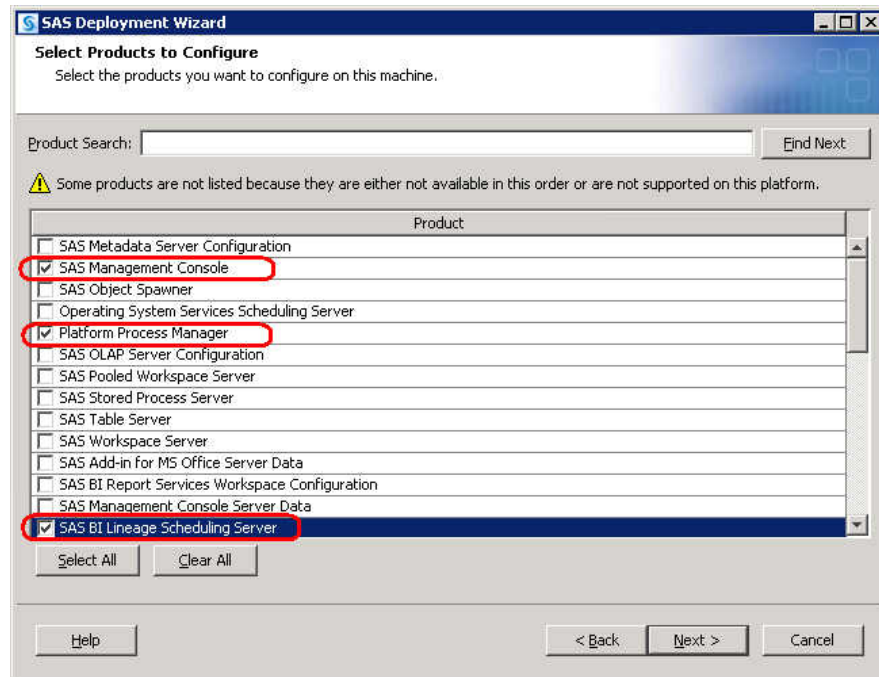
13. Answer the remaining deployment wizard prompts.

    The wizard will install and initially configure machine 2 based on the input that you have provided.

14. If you are deploying a middle-tier machine and opted not to automatically deploy your SAS Web applications, then you must manually deploy them. For more information, go to the Third-Party Software Downloads site at `http://support.sas.com/resources/thirdpartysupport/v93/appservers/index.html` and select the product name of your Web application server.

15. When you are finished installing and configuring SAS on each machine called for in your deployment plan, proceed to the section "Validate the SAS 9.3 Servers" on page 121.

Installing SAS Web Parts for Microsoft SharePoint

Overview of Installing SAS Web Parts for Microsoft SharePoint

This section contains the following topics:

- "What Is SAS Web Parts for Microsoft SharePoint?" on page 93

- "SAS Web Parts for Microsoft SharePoint Architecture" on page 93

- "Automatically Deploy SAS Web Parts for Microsoft SharePoint" on page 93

- "Manually Deploy SAS Web Parts for Microsoft SharePoint and Move It" on page 96

- "Configure HTTPS Connections for SAS Web Parts for Microsoft SharePoint" on page 97

- "Configure User Access for SAS Web Parts for Microsoft SharePoint" on page 97

What Is SAS Web Parts for Microsoft SharePoint?

SAS Web Parts for Microsoft SharePoint enables you to display SAS BI Dashboard and SAS Analytics in SharePoint pages. SAS Web Parts for Microsoft SharePoint is supported on Microsoft 64-bit machines.

SAS Web Parts for Microsoft SharePoint includes the following components:

- the SAS BI Dashboard Web Part, which displays dashboards and KPIs to enable users to monitor organizational performance

- the SAS Stored Process Web Part, which enables users to view the results of a stored process on the SharePoint site

SAS Web Parts for Microsoft SharePoint Architecture

SAS Web Parts for Microsoft SharePoint consists of the following components:

- SAS Web Parts

  This component is deployed on the SharePoint server.

- SAS Web Parts Service

  This service runs in a separate Microsoft Internet Information Server (IIS) application from SharePoint, and can be installed on the same machine where SharePoint resides or on a separate machine. SAS Web Parts Service for Microsoft SharePoint provides communication between SAS Web Parts and your SAS servers. This Web service can be hosted on your SharePoint server or another Microsoft Windows machine that is running Microsoft Internet Information Server.

  The SAS Web Parts Service must be able to connect to your SAS servers via SAS Integration Technologies. Therefore, a firewall cannot exist between the SAS Web Parts Service and the SAS servers. Because the SAS Web Parts connect to the service via SOAP over HTTPS, a firewall can exist between the SAS Web Parts Service and SharePoint. In the most common and simple deployments, this service runs on the SharePoint server.

Automatically Deploy SAS Web Parts for Microsoft SharePoint

This topic provides an overview for how you use the SAS Deployment Wizard to automatically install and configure SAS Web Parts for Microsoft SharePoint. For more information about automatically deploying SAS Web Parts, see "Install and Configure SAS Interactively" on page 98.

Note: If you want to avoid installing a Java Runtime Environment (JRE), a dependency for the deployment wizard, you can manually deploy SAS Web Parts on a machine that contains a JRE and move the SAS Web Parts deployment to another machine. For more information, see "Manually Deploy SAS Web Parts for Microsoft SharePoint and Move It" on page 96.

1. Install the SAS Web Parts and the SAS Web Parts Services.

   When running the SAS Deployment Wizard, select the deployment plan for the **SharePoint** machine.
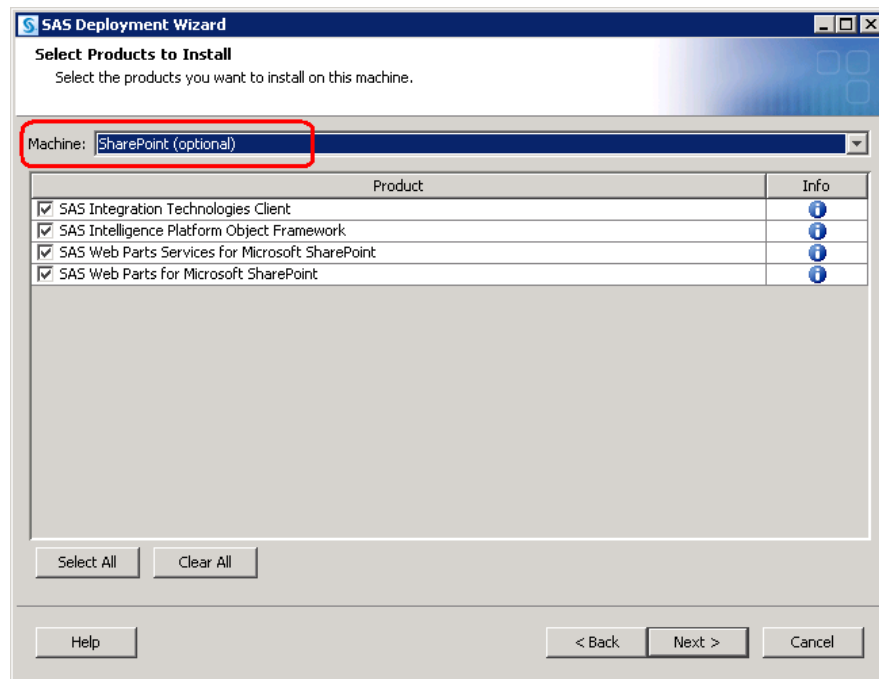
If your SharePoint installation is not in the default location (`C:\inetpub \wwwroot\wss\VirtualDirectories\80`), you have to select the **Custom** option for the prompting level in the deployment wizard:
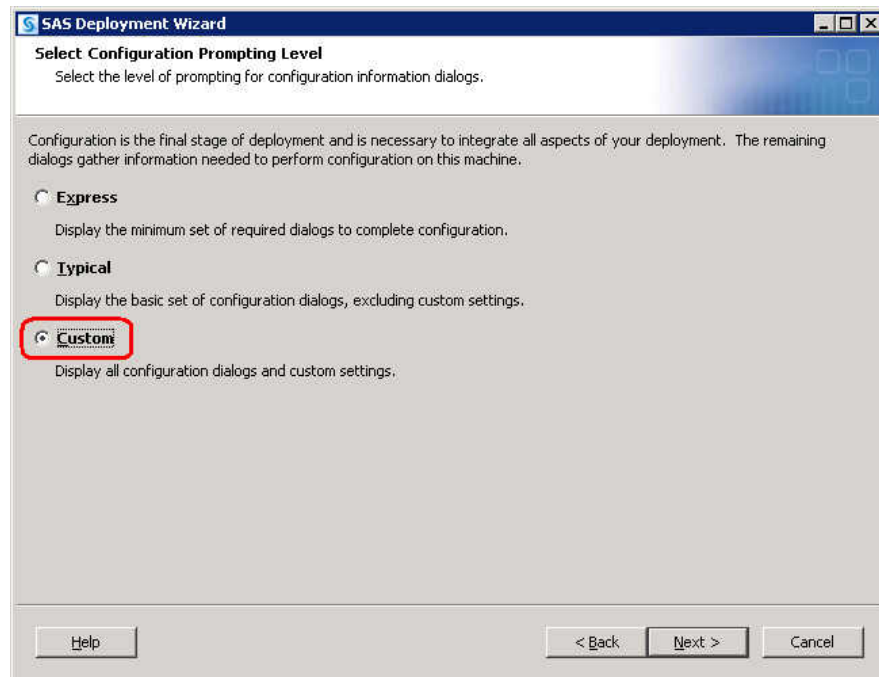
You must also change the installation path in the **SharePoint installation directory** field:

If you choose the option **Automatically Deploy SAS Web Parts for Microsoft SharePoint** in the SAS Deployment Wizard, SAS Web Parts is deployed and configured automatically.

For more information about automatically deploying SAS Web Parts, see "Install and Configure SAS Interactively" on page 98.

2. Secure SAS Web Parts for Microsoft SharePoint.

   For more information, see "Configure HTTPS Connections for SAS Web Parts for Microsoft SharePoint" on page 97.

Manually Deploy SAS Web Parts for Microsoft SharePoint and Move It

The SAS deployment and configuration tools rely on a Java Runtime Environment (JRE) that is not a dependency for SAS Web Parts. To avoid installing a JRE on your Microsoft SharePoint server, you can deploy SAS Web Parts on a machine which does contain a JRE and then move your deployment to your SharePoint server later.

To manually deploy SAS Web Parts for Microsoft and then move it to a different machine, follow these steps:

1. Run the SAS Deployment Wizard on a machine that contains the required JRE.

   For more information, see "Install and Configure SAS Interactively" on page 98.

2. On the Automatic Deployment page, be sure to *deselect* the option **Automatically Deploy SAS Web Parts for Microsoft SharePoint**.
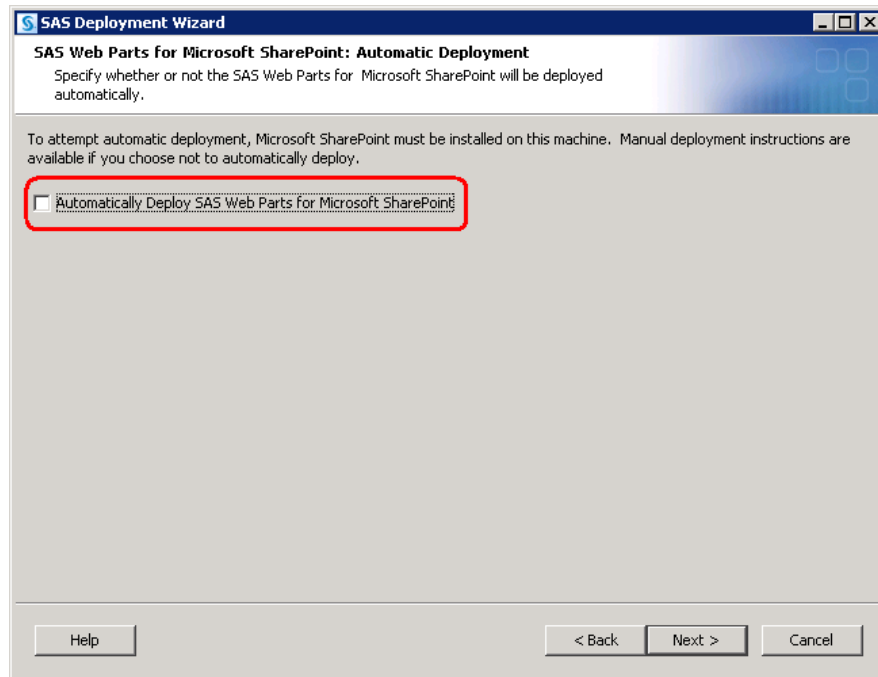
3. After the deployment wizard has finished executing, on the machine where you deployed SAS Web Parts, navigate to the **Applications** subfolder under the SAS configuration folder.

   For example: **C:\SAS\Lev1\Applications**.

4. Under the **Applications**, copy the subfolder **SAS Web Parts for Microsoft SharePoint** to the Microsoft SharePoint server where you want to deploy the SAS Web Parts software.

   An example target location on the SharePoint server is: **C:\Program Files\SAS Web Parts for Microsoft SharePoint**.

   Note: Be sure to copy (not move) the subfolder so that you can continue to apply updates or reconfigure your SAS Web Parts deployment in the future.

5. On the Microsoft SharePoint server, run the batch file WebPartsSetup.bat.

   WebPartsSetup.bat resides in the **SAS Web Parts for Microsoft SharePoint** subfolder that you copied in the previous step.

   A Windows command prompt window displays that lists the progress and status of the SAS Web Parts installation and configuration.

6. When prompted, press any key to close the command prompt window.

   The move of SAS Web Parts for Microsoft SharePoint to the new machine is now complete.

7. Secure SAS Web Parts for Microsoft SharePoint.

   For more information, see "Configure HTTPS Connections for SAS Web Parts for Microsoft SharePoint" on page 97.

Configure HTTPS Connections for SAS Web Parts for Microsoft SharePoint

The connection between SAS Web Parts and the SAS Web Parts Service requires Hypertext Transfer Protocol Secure (HTTPS) to encrypt the communication. HTTPS uses Secure Socket Layer (SSL) and public key cryptography, which is based on the implementation of a public and private key pair.

To enable HTTPS, an SSL server certificate must be attached to the SAS Web Parts Service. If your organization has a standard procedure for obtaining an SSL server certificate, follow those guidelines and attach that certificate to the service.

Another alternative is to use a self-signed SSL certificate for the SAS Web Parts Service. Because the secure communication occurs only between SAS Web Parts and SAS Web Parts Service, the self-signed certificate needs to be imported only into the Microsoft SharePoint machine's certificate store. Refer to your Microsoft Internet Information Server (IIS) documentation for instructions on how to create and install the self-signed certificate, and complete the following steps:

1. On the machine hosting the SAS Web Parts Service, use the IIS Manager to create a self-signed certificate and associate it with the SASWebPartsService Web site.

2. On the SharePoint Server host, import the self-signed certificate into Internet Explorer's Trusted Root Certification Authorities store.

For more information about how to create and install a self-signed certificate, see the following SAS Note:

http://support.sas.com/kb/39/912.html

Configure User Access for SAS Web Parts for Microsoft SharePoint

Users of SAS Web Parts for Microsoft SharePoint can access content in the SAS servers in one of two modes:

- Actual identity (default)

- Shared identity

Actual identity controls user access to SAS Web Parts explicitly through a SAS metadata identity and the permissions associated with that identity. Users might have permissions in SharePoint to view a page, but they can be denied access to the Web part's content if they are not granted permission to access the dashboard or stored process in SAS metadata. For information about creating metadata identities and assigning permissions, see "About User Administration" in Chapter 2 of *SAS Intelligence Platform: Security Administration Guide*.

Shared identity controls user access to SAS Web Parts through a single identity defined in SAS metadata that all users share. Authentication of the individual user is managed by SharePoint.

CAUTION:

When using shared identity, it is important in SharePoint to grant access to only those users who are allowed to view SAS content.

To enable shared identity, store the SAS metadata identity in the web.config file.

CAUTION:

In addition to storing a possible shared metadata identity, web.config also contains connection information to the SAS Web Parts service plus an encrypted form of the SAS Trusted User ID and password. As a best practice, we recommend that you limit access to web.config. The default location for config.web in IIS 6 is: `C:\Inetpub\wwwroot\wss\VirtualDirectories\80\web.config`. For more information, see your Microsoft Internet Information Server documentation.

For more information about user access and authentication domains, see the *SAS Intelligence Platform: Security Administration Guide*.

Install and Configure SAS Interactively

Installing and configuring SAS interactively with the SAS Deployment Wizard consists of two main phases:

- Providing installation information such as the following:

    - installation type (planned or unplanned)

    - deployment plan location (if planned)

    - machine type (single machine, server machine, and so on)

    - SAS components to be installed on the machine

    - valid paths to any required pre-installed, third-party software

- Providing configuration information such as the following:

    - prompting level (express, typical, custom)

    - SAS components to be configured on the machine

    - configuration directory name

    - single sign-on preference (Windows only)

    - required user account credentials

    - server port numbers

This topic describes some of the more important configuration pages that you will encounter during the installation and configuration phases of a SAS 9.3 deployment. The type and number of configuration-related pages that you will see depend on the prompt level that you choose, the SAS tier that you are currently deploying, and the contents of your SAS 9.3 custom order. "Configuration Options by Prompt Level" on page 144 lists which configuration options are available for each prompt level. For information about all SAS Deployment Wizard prompts, see the online Help for the wizard page in question.

Note: Starting with the March 2012 release of SAS 9.3, the deployment wizard can be run on operating systems that do not have windowing systems. For more information, see the *SAS Deployment Wizard and SAS Deployment Manager User's Guide*, available at: `http://support.sas.com/documentation/installcenter/en/ikdeploywizug/64204/PDF/default/user.pdf`.

To install and configure SAS interactively, complete these steps:

1. Make sure that you have reviewed all of the documents listed in "Step 1: Review Additional Documentation" on page 2.

2. Verify that you have performed the earlier required steps outlined in "Overview of Installing and Configuring Your SAS Software" on page 78.

   Note: A few pages into the SAS installation, the SAS Deployment Wizard prompts you for paths to the requested third-party software. You must have the necessary third-party software installed on the current machine, or the SAS Deployment Wizard will *not* let you continue with the installation. In this situation, you will have to end the SAS Deployment Wizard session and install the required third-party software before you can continue.

3. If you use any garbage collection scripts, temporarily suspend these scripts during SAS Deployment Wizard execution. If any wizard temporary files are deleted during wizard execution, configuration failures can occur.

4. Review information about where to source certain SAS content repositories described in "Content Repository Considerations" on page 82.

5. Review information about SAS Deployment Wizard configuration prompting levels described in "Overview of Configuration Options by Prompt Level" on page 143.

6. If you are deploying SAS on multiple machines, make sure that you are following the process described in "Installation Order Rules for Multiple Machine Deployments" on page 81.

7. If you are deploying the SAS middle tier and intend on having the SAS Deployment Wizard automatically configure your Web application server, make sure that the server is installed, but not running.

8. If any machines on which you are deploying SAS 9.3 use IPv6, then a different deployment procedure is required. For more information, see "IPv6 Windows Machines That Communicate with SAS Foundation Servers" on page 85.

9. Log on to the machine with a user ID that meets the requirements for the appropriate operating system:

   • Windows:

     Use an account that is available for the long term (for future SAS maintenance) and is a member of the Administrators group.

   • UNIX:

     Use the same account on all machines on which you are deploying SAS. Do not use **root**.

   • z/OS:

     Use the same account on all machines on which you are deploying SAS.

10. Start the SAS Deployment Wizard from the highest-level directory in your SAS Software Depot using the command appropriate for your operating system:

    Table 5.1   Start Up Commands for the SAS Deployment Wizard

Operating System	Command
Windows	**setup.exe -record -deploy**

Operating System	Command
UNIX	`setup.sh -record -deploy`

z/OS	First invocation of the deployment wizard to install the metadata server as a 64-bit application:
	`setup.rexx -z64 -record -deploy`
	
	Second invocation of the deployment wizard to install the remainder of your SAS 9.3 order as a 31-bit application:
	`setup.rexx -record -deploy`
	
	To use a temporary directory other than `/tmp`, specify `-templocation` *new-temp-dir*.

Note: Using the `-record -deploy` options causes the wizard to create a response file that records the inputs that you supplied. This can be helpful when you want to repeat the deployment on other machines or when troubleshooting a deployment issue.

By default, the deployment wizard writes the response file in the following location:

- Windows:

  `C:\Documents and Settings\`*current-user*`\sdwresponse.properties`

- UNIX and z/OS:

  `~/sdwresponse.properties`

You should see a welcome page similar to the following:

11. Select the language that you want the SAS Deployment Wizard to use when it displays text.

    For more information, see "Locale and Encoding Considerations" on page 82.

12. Select **Install SAS Software**.

13. If you have more than one SAS software order in your depot, the wizard prompts you to select the order that you want to deploy.

14. Select **Perform a Planned Deployment**, and make sure that **Install SAS Software** and **Configure SAS Software** are both selected.
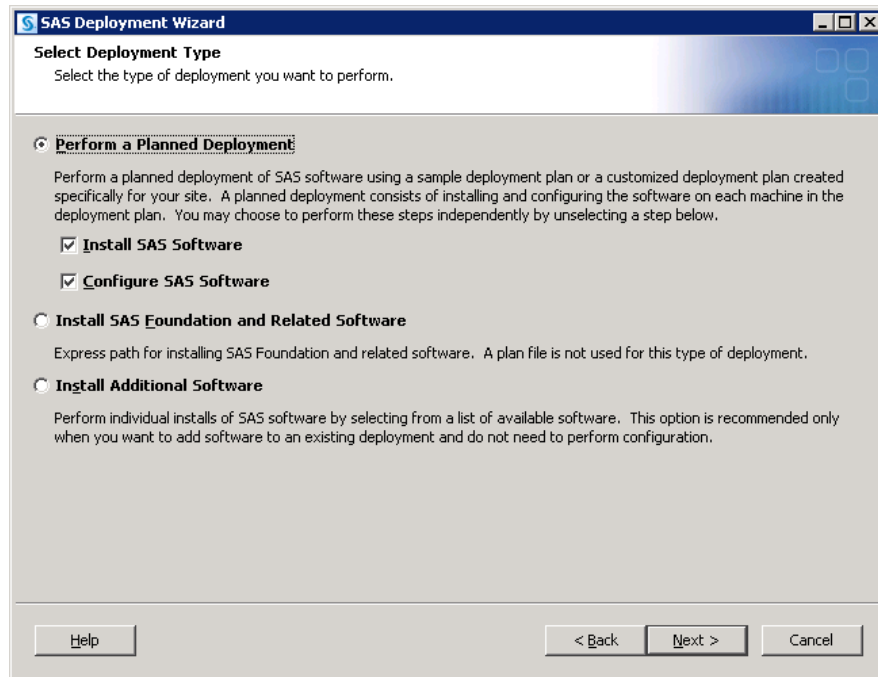
Note: If any machines on which you are deploying SAS 9.3 use IPv6, then a different deployment procedure is required. For more information, see "IPv6 Windows Machines That Communicate with SAS Foundation Servers" on page 85.

15. Specify the location (SAS Home) where you want to install SAS. For more information, see "SAS Installation Directory (SAS Home) Considerations" on page 81.

    Note: The deployment wizard prompts you for SAS Home the first time you run the wizard. On any subsequent sessions on this machine, the wizard uses the previously specified location for SAS Home.

    Note: SAS Home should *not* be a directory within your SAS Software Depot.

    Note: On z/OS, the length of the SAS Home path cannot exceed 54 characters.

16. Specify the type of deployment plan that you are using:

    • customized deployment plan

      Choose **Specify the full path to a customized deployment plan**, and then click **Browse** to navigate to the plan file (`plan.xml`).

    • standard deployment plan

      Choose **Select a standard deployment plan**, and then choose the appropriate plan in the drop-down list.

      For more information, see "About Deployment Plans" on page 79.
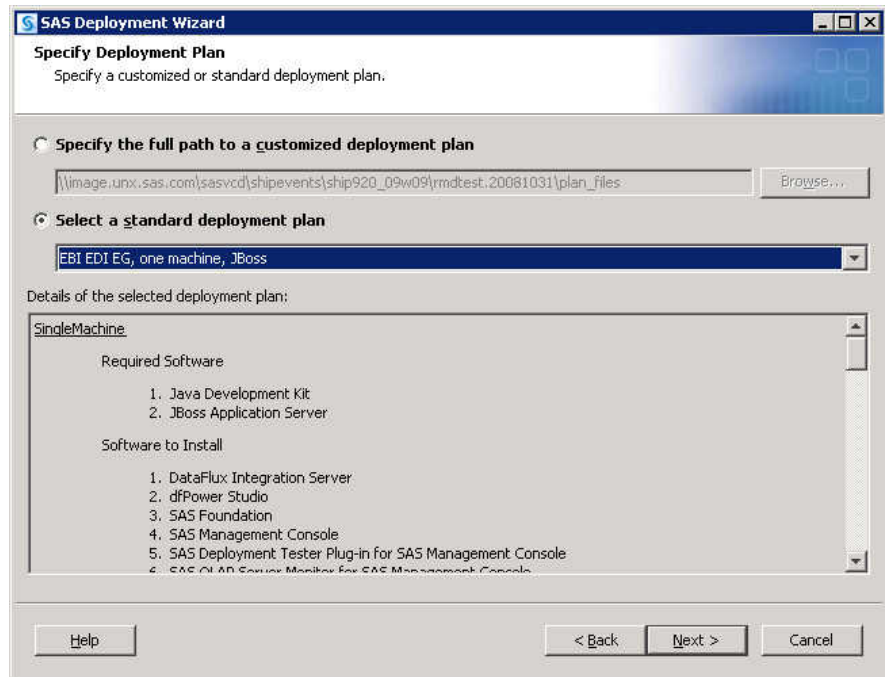
17. Select the machine on which you are installing software, and select the SAS products that you want to install, by doing the following:

    a. Select the machine on which you are installing software from the **Deployment Step** drop-down list.

       Note: If you are deploying SAS on multiple machines, make sure that you are following the process described in "Installation Order Rules for Multiple Machine Deployments" on page 81 .

       Note: When a machine has multiple deployment steps, the deployment wizard attempts to default to the correct step. However, in some cases this can be difficult for the wizard to determine. Therefore, always be careful to choose the correct step and avoid merely choosing the default step.

    b. By default, all products displayed will be installed. Deselect any products that you do *not* want to install.
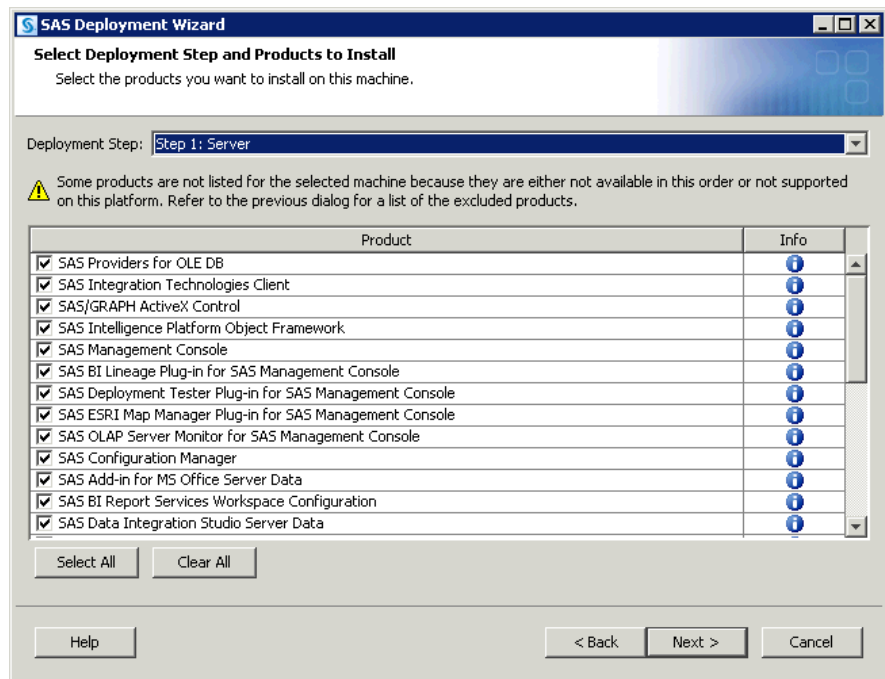
18. If SAS Enterprise Guide is in your deployment plan, and you are deploying on a 64-bit machine, the wizard prompts you whether to install SAS Enterprise Guide in 32-bit or 64-bit mode.

    If you want to take full advantage of your 64-bit machine, select 64-bit Native Mode. If you are concerned about compatibility with 32-bit software that you have installed or may eventually install, select 32-bit Compatibility Mode. Note that some products have a dependency on 32-bit SAS Enterprise Guide. If one of those products is in the list of products to be installed and you choose to install the 64-bit version of SAS Enterprise Guide, the 32-bit version will be installed also.

    Note: In the 64-bit version of SAS Enterprise Guide, you cannot open Microsoft Exchange or Microsoft Access data or send files by using e-mail applications that support the Messaging Application Programming Interface (MAPI). If you need these features, install the 32-bit version of SAS Enterprise Guide.

19. If SAS Add-In for Microsoft Office is in your deployment plan, and you are deploying on a 64-bit machine, the wizard prompts you whether to install SAS Add-In for Microsoft Office in 32-bit or 64-bit mode.

    If you want to take full advantage of your 64-bit machine, select 64-bit Native Mode. If you are concerned about compatibility with 32-bit software that you have installed or may eventually install, select 32-bit Compatibility Mode.

20. Specify the location of the SAS installation data file that contains information about the software that you have licensed for the current machine.

    CAUTION:
    Be careful to use the correct installation data file that contains the SAS products that you are planning to install. Using an incorrect file can cause installation failure for SAS add-on products or other errors later when attempting to run SAS.

21. Deselect any languages that you do not want SAS to support. By default, SAS attempts to support all languages that your machine's operating system is configured for.

22. Specify the URL for the SAS environment file.

The SAS environment file defines the available set of SAS environments for SAS client applications, and is generated during the configuration of the SAS Web Infrastructure Platform. The file sas-environment.xml is located in the **SAS-config-dir\Lev1\Web\Common** directory.

An entry for a SAS system using a JBoss application server might resemble the following:

http://mySASWebserver.com:8080/SASLogon/sas-environment.xml

For more information, see Appendix 1, "Configuring the SAS Environment File," in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

23. Select the locale that affects how SAS displays text, numbers, currencies, dates, times, and sorts data. If you want to configure SAS as a Unicode server, do that here.

    For more information, see "Locale and Encoding Considerations" on page 82.

24. The deployment wizard prompts you to do one of the following:

    (z/OS only) **No Java Runtime Environment**
        Select to have the deployment wizard install your software on z/OS without a Java Runtime Environment (JRE).

    (UNIX and Windows only) **Use the recommended Java Runtime Environment**
        (Recommended) select to have the deployment wizard install the required JRE on this machine.

        On UNIX, specify in the text field where you want the deployment wizard to extract the JRE.

    Select an existing Java Runtime Environment
        Select to specify the path to a JRE that you have already installed on this machine.

    For more information, see **http://support.sas.com/resources/thirdpartysupport/v93/jres.html**.

25. On Windows, on the Select Microsoft Office Applications page, choose the Microsoft Office applications for which you want the SAS Add-In for Microsoft Office activated.

    When the Office application is launched, the activated SAS add-in automatically loads, and users see either a **SAS** tab on the Ribbon (Microsoft Office 2010 and 2007) or a **SAS** menu and toolbars (Microsoft Office 2003). To activate the SAS Add-In for Microsoft Office in Microsoft Excel, Word, PowerPoint, or Outlook after the installation, you can run SwitcherUtility.exe. For more information, see the Help for the SAS Add-In for Microsoft Office.

26. The deployment wizard scans your machine to determine whether any pre-existing SAS files are locked or do not have Write permission. If the wizard lists any files in the text box, then while the wizard is running, quit SAS and add Write permission to the files listed. When you are finished, click **Next**.

27. (z/OS only) Provide input for the following prompts:

    Note: For more information, see the *SAS Deployment Wizard and SAS Deployment Manager User's Guide* available at: **http://support.sas.com/documentation/installcenter/en/ikdeploywizug/64204/PDF/default/user.pdf**.

    - **FTP Batch Generation**

      Specify the fully qualified host name or IP address of the z/OS mainframe machine on which you are deploying SAS. Also supply a valid user ID and password with which the SAS Deployment Wizard will FTP deployment information to the mainframe machine.

    - **Specify Jobcard Information**

      Specify the job account, programmer-name, message class, message level, time, and region values. For more information, consult your z/OS documentation.

    - **Select Installation Action**

      Choose **A - Install a new SAS system**.

    - **Specify New Installation Qualifier**

      Specify the path where you want to install SAS. You can also choose to require Storage Management Subsystem (SMS) parameters. For more information, consult your z/OS documentation.

    - **Specify IBM's SMS Parameters**

      If you chose to require Storage Management Subsystem (SMS) parameters on the previous page, enter them here. For more information, consult your z/OS documentation.

    - **Specify Parameters**

      These are all parameters that are used in various DD statements throughout the installation. For more information, consult your IBM JCL documentation.

    - **Specify Entry Point**

Specify the parameters for various ways that SAS can be run with different performance implications. Choose SAS (default ENTRY point) to run the unbundled configuration. Choose SASB to run the bundled configuration. Choose SASLPA to run the bundled configuration with some modules installed in the Link Pack Area (LPA).

• **Specify Parameters**

Specify additional parameters for DD statements. VOLDISK designates the VOLSER that the installed data sets will go to. For more information, consult your IBM JCL documentation.

• **Specify Parameters**

Specify parameters used for reblocking the SAS load modules to a library with an optimum block size.

28. If you use a third-party database and SAS/ACCESS is a part of your order, select the software version for the third-party database.

The deployment wizard uses your selection to configure SAS/ACCESS for the correct version of the third-party database.

Make sure that you perform any additional configuration on your system, such as installing the third-party database client and configuring the system environment for access to the native client libraries. For more information about the correct environment variables, go to the SAS Install Center at **http://support.sas.com/documentation/installcenter/93**, and use the operating system and SAS version to locate the appropriate SAS Foundation Configuration Guide.

29. (UNIX only) If your system uses Pluggable Authentication Modules (PAM), select **Use PAM Authentication**. In addition, you might also need to update your PAM configuration files in order for SAS 9.3 to use PAM authentication. For more information, see the *Configuration Guide for SAS 9.3 Foundation for UNIX Environments*.

If you are uncertain that this system uses PAM for authentication, contact your system administrator.

Note: Do not select the PAM option if you know that your system uses **/etc/password** or **/etc/shadow** authentication.

30. Review the list of third-party software that is required for the SAS software that you are installing on the current machine. (The list of third-party software depends on the SAS software that you are installing on the current machine.) In the pages that immediately follow, be prepared to provide paths to these third-party applications. For more information about the third-party software versions that SAS 9.3 supports, see "Pre-installation Checklists for Third-Party Products" on page 71. (The number of wizard pages varies depending on the SAS software that you are deploying on the current machine.)

Note: You must provide valid paths to the requested third-party software, or the SAS Deployment Wizard will *not* let you continue with the installation.

31. Specify the amount of information to provide the SAS Deployment Wizard for configuring the SAS software that you are installing on the current machine. Choose one of the three prompting levels:

Note: When deploying the SAS 9.3 middle-tier, by default, the SAS Deployment Wizard automatically configures your Web application server. To disable this feature, run the wizard using either the Typical or Custom prompting levels.

Express
> display the minimum number of wizard pages needed to complete the SAS configuration.

Typical
> display the basic set of wizard pages needed to complete the SAS configuration.

Custom
> display all the wizard pages needed to complete the SAS configuration.

> Refer to "Overview of Configuration Options by Prompt Level" on page 143 for more information about the SAS Deployment Wizard prompting levels.

32. Provide the remaining configuration information as the wizard prompts you for it.

> *Note:* This topic describes some of the more important pages that you will encounter during the configuration phase of a SAS 9.3 deployment. The options for which the SAS Deployment Wizard prompts you depends on which SAS products are identified in your deployment plan and, in multiple machine deployments, which machine you are currently deploying. "Configuration Options by Prompt Level" on page 144 lists which configuration options are available for each prompt level. For information about all SAS Deployment Wizard prompts, see the online Help for the wizard dialog box in question.

Specify Configuration Information
> Select the path where the SAS Deployment Wizard will write SAS configuration files and logs and the level that you want to deploy (for example, Lev1 = production).

> In UNIX environments the SAS Installer generally overrides the default configuration directory with the site's preferred location (for example, **/opt/sas/config**). The installer must have Write permission on this path.

> *Note:* The last digit of the default port number reflects the configuration level that you select in the SAS Deployment Wizard. For example, when you select **Lev1**, the default port for the metadata server is 8561. If you choose another level, such as **Lev2**, the wizard changes the default port to 8562.

> For more information, see "Overview of the Configuration Directory Structure" in Chapter 2 of *SAS Intelligence Platform: System Administration Guide*.

> *Note:* Although your SAS Home and SAS configuration directories can share the same parent directory, one directory should not reside inside another. Defining the configuration directory under the SAS Home directory, or vice versa, can lead to file permission issues arising from the need to manage installed files differently than site-specific configurations.

> On z/OS, the mount point must exist. The SAS Deployment Wizard will create the necessary subdirectories.

> If you are deploying the SAS Framework Data Server, then SAS configuration path should be a path local to the machine. The configuration path should not be on an NFS shared disk. If you want to put your configuration path on a shared disk, then you must make sure that you specify a local path for the Framework Data Server content directory. You can set the content directory on the Framework Data Server Invocation Options page. This page is available only on the custom configuration prompting level.

Local Machine Name
> Enter the complete name of the local host in **Fully-qualified Local Host Name**. The fully qualified local host name typically takes the form of the local host

name plus the domain name server (for example, myserver.example.com). Enter a short host name in **Short Local Host Name**. The short local host name is the abbreviated, more common method of referring to the host, usually only a single word.

Migration Information

Ignore this page and click **Next**.

If you need to migrate SAS 9.1.3 content to SAS 9.3, see "Introduction" in Chapter 1 of *SAS Intelligence Platform: Migration Guide*.

Authentication Domain

Accept the default value (DefaultAuth), unless you are planning to use a different SAS authentication domain for servers on this machine.

For example, if the metadata server is on Windows and the workspace server is on UNIX, the workspace server might be assigned to a SAS authentication domain named UnixAuth. For more information, see "Manage Authentication Domains" in Chapter 2 of *SAS Management Console: Guide to Users and Permissions*.

Windows Options (run as managed scripts or services)

On Windows, choose how to run your SAS servers, either by using management scripts or running them as Windows services. If you choose the script option, then the user account that runs the object spawner must meet the following requirements on the object spawner machine:

- be the administrator or a member of the Windows Administrator's group

- have the following Windows local user rights:

- `Adjust memory quotas for a process`

- `Replace a process level token`

Integrated Windows Authentication

Select to configure workspace servers running on Windows or UNIX to use Integrated Windows authentication (IWA). IWA uses a single sign-on feature which allows a user's identity, obtained from authentication to the user's desktop, to be securely passed from the desktop to other processes such as the metadata server and the workspace server running on either Windows or UNIX. The mechanism used is typically Kerberos, but on Windows, NTLM may also be used.

You will also encounter this page when deploying SAS Enterprise Guide and SAS Add-In for Microsoft Office. If you have not chosen IWA for the workspace server, then choosing IWA for these clients has no effect.

For more information, see "Integrated Windows Authentication" in Chapter 10 of *SAS Intelligence Platform: Security Administration Guide* and the chapter "Configuring Integrated Windows Authentication" in *Configuration Guide for SAS Foundation for UNIX Environments*, available at: **http:// support.sas.com/documentation/installcenter/en/ ikfdtnunxcg/64205/PDF/default/config.pdf**.

A metadata server running on Windows or Unix has IWA enabled by default. For more information, see "SSPI System Option" in *SAS Intelligence Platform: Application Server Administration Guide*.

SAS Metadata Server

If you have any changes for the metadata server, enter them in this page.

The deployment wizard creates a separate server context (SASMeta) for the metadata server and the other servers required to perform metadata server utility functions, such as backup and promotion. A server context is a SAS IOM server concept that describes how SAS Application Servers manage client requests. A SAS Application Server has an awareness (or context) of how it is being used and makes decisions based on that awareness. The server context name is prepended to all server names defined in the server context. Therefore, we recommend that you not change the logical server or server prefix (SASMeta).

For more information, see "Overview of the SAS Metadata Server and Its Initial Configuration" in Chapter 2 of *SAS Intelligence Platform: System Administration Guide*.

Deployment Accounts: Type of Accounts
Select whether to use internal accounts when appropriate. Internal user accounts are accounts known only to SAS and are created and authenticated internally in metadata rather than externally.

Note: On Windows, whenever the deployment wizard prompts you for an external account, always enter a domain-qualified user account (for example, myDomain\myAccount).

For more information, see "Internal User Accounts" on page 7.

External Account: Installer
Enter the user ID and password for the external account to be used to install and configure SAS. Depending on the operating system, this account should meet the following requirements:

- Windows:

  Use a domain-qualified account that is available in the long term (for future SAS maintenance) and is a member of the Administrators group.

- UNIX:

  Use the same account on all machines on which you are deploying SAS. Do not use **root**.

- z/OS:

  Use the same account on all machines on which you are deploying SAS.

For more information, see "Defining User Accounts" on page 6.

SAS Internal Account: Unrestricted Administrator
Enter a password for the internal account (sasadm@saspw) that the wizard will create to serve as an unrestricted administrator for the purpose of configuring the SAS metadata server.

For more information, see "Defining User Accounts" on page 6.

SAS Internal Account: Trusted User
Enter a password for an internal account (sastrust@saspw) that the wizard will create to enable SAS server and spawner components to communicate securely with each other.

For more information, see "Defining User Accounts" on page 6.

SAS BI Web Services: Authentication Method
Select the method by which users of SAS BI Web Services are authenticated:

- **SAS Authentication** is managed by the metadata server.

- **Web Authentication** is managed by the Web application server using container-based authentication or a third-party product. Selecting **Web Authentication** has these effects:

- partially configures Web authentication for Java BI Web Services. For more information, see "Securing SAS BI Web Services for Java " in Chapter 10 of *SAS Intelligence Platform: Middle-Tier Administration Guide*.

- has no effect on the BI Web applications (such as SAS Web Report Studio, SAS Web Information Portal, and so on). You will have to configure Web authentication for these BI Web applications.

- prevents you from being offered a chance to set up an anonymous Web user (as this is incompatible with Web authentication).

Anonymous Web Access

When using SAS authentication, you can select this option to set up a SAS identity for anonymous access to certain Web services and Web applications that support this feature. Currently, SAS BI Web Services for Java and .NET and the SAS Stored Process Web Application are the only components that support this feature.

For more information, see "Using the SAS Anonymous Web User with SAS Authentication" in Chapter 3 of *SAS Intelligence Platform: Middle-Tier Administration Guide*.

SAS Internal Account: Anonymous Web User

(Optional) Enter the user ID and password for the internal SAS account to be used to grant clients access to applicable SAS Web Infrastructure Platform applications such as SAS BI Web Services and the Stored Process Web Application. When SAS authentication is being used and the user has not preemptively specified credentials, the client will be given access to these Web applications under the anonymous user account.

For more information, see "Using the SAS Anonymous Web User with SAS Authentication" in Chapter 3 of *SAS Intelligence Platform: Middle-Tier Administration Guide*.

External account: SAS Spawned Servers Account

Enter the user ID and password for the external account to be used to start the pooled workspace server and the stored process server. On Windows, enter a domain-qualified user ID.

For more information, see .

Create Common Directories

Select to create common directories for server and spawner logs, user-specific files, data (SAS libraries for tables and cubes), and temporary work tables and files.

When you select this option, the deployment wizard creates the specified directory (`Logs`, `Users`, `Data`, and `Temp`) under the SAS configuration directory.

Server Encryption

Select the encryption level and algorithm that SAS clients and servers use to connect to the metadata server.

Choose **Credentials** to encrypt only login credentials. Choose **Everything** to encrypt all communication with the metadata server. (Choosing **Everything** can affect your SAS performance.)

To specify an encryption algorithm other than SASPROPRIETARY, you must have a license for SAS/SECURE software. The other algorithms are: RC2, RC4, DES, TripleDES, and AES.

For more information, see Chapter 13, "Encryption Model," in *SAS Intelligence Platform: Security Administration Guide*.

Client-side Credentials Policy

Select this option to set the policy to allow users to save their user IDs and passwords in client-side connection profiles on the metadata server for desktop applications. This input sets the value for OMA_SASSEC_LOCAL_PW_SAVE in omaconfig.xml.

For more information, see "Reference Information for omaconfig.xml" in Chapter 25 of *SAS Intelligence Platform: System Administration Guide*.

E-mail Server

Enter the port and host name for an SMTP e-mail server that the SAS Metadata Server uses to send e-mail alerts to an administrator if journaling issues arise. The SAS Deployment Wizard also uses this e-mail server as the default for the SAS Application Server to provide e-mail services to various SAS clients. For example, with SAS Data Integration Studio, you can use a Publish to Email transformation to alert users about various data changes. In order for the SAS BI Dashboard to send alerts by e-mail to dashboard users and administrators, the port and host name must be configured for the e-mail server.

For more information, see "Adding or Modifying E-Mail Settings for SAS Application Servers" in Chapter 11 of *SAS Intelligence Platform: Application Server Administration Guide* and "Managing Alert E-mail Options for the SAS Metadata Server" in Chapter 14 of *SAS Intelligence Platform: System Administration Guide*.

SAS Application Server: Server Context

Enter the name of the server context for the SAS Application Server definition. A server context is a SAS IOM server concept that describes how SAS Application Servers manage client requests. A SAS Application Server has an awareness (or context) of how it is being used and makes decisions based on that awareness. The server context name is prepended to all server names defined in the server context.

Note: The server context name must be unique.

For more information, see "Overview of SAS Application Servers" in Chapter 2 of *SAS Intelligence Platform: Application Server Administration Guide*.

Metadata Utility Workspace Server

Enter the name of the logical workspace server and the workspace in metadata. You also need to enter the name of the machine on which the workspace server runs and the port on which the object spawner will listen for client requests to launch workspace servers. The machine name should match the name specified to the object spawner.

Unlike a regular workspace server, access to this server is limited to members of the SAS Administrators group, and its use is limited to metadata server administration tasks such as promotion and backup.

In SAS 9.3, two or more workspace servers can share the same port even if they are running at the same time.

For more information about ports, see "Designating Ports and Multicast Addresses" on page 20.

SAS Pooled Workspace Server

Enter the name of the logical pooled workspace server and the pooled workspace in metadata. You also need to enter the name of the machine on which the pooled workspace server runs and the port on which the object spawner will listen for client requests to launch pooled workspace servers. The machine name should match the name specified to the object spawner.

For more information, see "Overview of Workspace Servers and Stored Process Servers" in Chapter 3 of *SAS Intelligence Platform: Application Server Administration Guide*.

SAS Framework Data Server

Enter the name of the logical Framework Data Server in metadata. You also need to enter the name of the machine on which the Framework Data Server runs and the TCP/IP port on which the Framework Data Server will listen to. For more information, see the *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Metadata Utility SAS DATA Step Batch Server

Enter the various values required to configure a SAS DATA step batch server. The directory fields identify where the deployed SAS program is stored and the name of the deployed SAS DATA step program job. Access to this server is limited to members of the SAS Administrators group, and its use is limited to metadata server backup.

For more information, see "Contents of the Metadata Server Subdirectory (SASMeta)" in Chapter 23 of *SAS Intelligence Platform: System Administration Guide*.

Query Cache Library

Enter the physical location on the file system where the SAS library will exist for temporary files used when creating optimized tables for query look up.

In **Query Cache Libref**, enter the SAS library reference which SAS will use to refer to the query optimizer SAS library. The name must be eight characters or shorter and should be unique from other librefs used within this repository. Librefs must start with a letter or underscore and contain only letters, numerals, or underscores. The typical installation libref name is wrstemp. The libref will be used in conjunction with the server context name to form the SAS library name for the optimizer library.

Select **Enable Query Cache** to allow the query optimizer to run. If this selection is not made, then the query optimizer will not attempt to optimize queries and will not create temporary data sets for improving performance during rendering. A typical installation will have this selection turned on. The temporary files created within the query cache library will be visible to anyone with Read permission on the Renderer Optimizer directory, so if you have security concerns with the authorization on this folder, you might want to leave the optimizer off.

For more information, see "Using the Query Cache " in Chapter 4 of *SAS Intelligence Platform: Web Application Administration Guide*.

Output Management Library

Enter the physical location on the file system where the SAS library will exist for burst set definition tables for reports which will be distributed by e-mail. A burst definition table will contain e-mail addresses, channels, and possibly by group information.

In **Output Management Library Libref**, enter the SAS library reference that SAS will use to refer to the output management SAS library. The name must be eight characters or shorter and should be unique from other librefs used within

this Repository. Librefs must start with a letter or underscore and contain only letters, numerals, or underscores. The typical installation libref name is wrsdist. The libref will be used in conjunction with the server context name to form the SAS library name for the distribution library.

For more information, see "Verifying Permissions for the Distribution Library " in Chapter 7 of *SAS Intelligence Platform: Web Application Administration Guide*.

Web Application Server: Automatic Configuration
Select this option for the deployment wizard to automatically build and configure the SAS Web applications as well as configuring a sample Web application server for use with SAS 9.3. (To use this wizard feature, make sure that your Web application server is not running before proceeding. For WebSphere, it is necessary to stop all deployment manager servers, all node agent servers, and all application servers before continuing with your SAS 9.3 deployment. The one exception is on z/OS, where the WebShere web application server should be running.) For more information, see "Choose Whether to Automatically Configure Your Web Application Server" on page 63.

Note: When installing SAS Enterprise BI server to use a WebSphere Base Server, make sure that you choose *not* to have the SAS Deployment Wizard automatically configure your Web application server.

If you choose not to automatically configure your Web application server, you will still be prompted for Web application server information, and deployment stages such as Configure Products, Deploy Web Applications, and Start Web Application Servers will execute to create instructions for manual deployment. When configuration is complete, follow these manual instructions on how to configure your server and deploy your Web applications. If you manually configure WebLogic, a reference domain will be created in your SAS configuration area, but no servers will be started. If you manually configure JBoss, sample start scripts will be created, but not launched.

For more information, go to **http://support.sas.com/resources/ thirdpartysupport/v93/appservers/index.html** and select the product name of your Web application server.

Web Application Server: Multiple Managed Servers
Select to have the deployment wizard automatically configure multiple managed servers for you using SAS best practices for choosing the server to deploy each application to.

In some situations, it might be preferable to split the SAS Web applications across multiple managed servers. This is usually done for performance reasons.

If you chose to manually configure your application servers, you will be provided with recommended configuration settings in a generated instructions file (Instructions.html) when the SAS Deployment Wizard completes.

More advanced performance configuration considerations are documented in the *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Web Application Server: Managed Server
Enter a logical name for your managed server. This name will be displayed in your application server administrative console and used in administrative scripting.

CAUTION:
The managed server name must be unique. Non-unique names will cause your Web configuration to fail.

In **HTTP Port**, enter the unsecured port on which the managed server will listen.

In **HTTPS Port**, enter the SSL port to be assigned to the managed server.

In **SOAP Port**, (WebSphere only) enter the SOAP port that the WebSphere administrative services will use to communicate with this managed server, if SOAP was selected. This port can also be used by the wsadmin utility.

In **RMI Port**, enter a port using these considerations:

- WebSphere

  This maps to the RMI BOOTSTRAP port. Each server contains an administrative services component and a separate and unique port is required for each application server.

- JBoss

  This maps to the default JNDI port. Clients connecting to applications running on JBoss, such as the JBoss shutdown command, would use this port.

- WebLogic

  No RMI port is required for WebLogic.

In **RMI Timeout**, Enter the RMI timeout value (in seconds) that will be used to determine when RMI requests between the WebSphere deployment manager and the nodeagent have timed out, if the RMI protocol was selected.

In **IPC Timeout**, enter the IPC timeout value (in seconds) that will be used to determine when IPC requests between the WebSphere deployment manager and the nodeagent have timed out, if the WebSphere deployment manager and the nodeagent are on the same host.

In **Configured Protocol**, select the communication protocol for the administration server: HTTP or HTTPS. Automated configuration through the SAS Deployment Wizard only supports the HTTP protocol. If you perform a manual configuration, you can set up HTTPS.

In enter any additional Java options that you want the managed server JVM (Java Virtual Machine) to use. These JVM options are tagged onto the end of the managed server's command line. Options that are deployment wizard defaults can be overridden in this way.

For more information, go to **http://support.sas.com/resources/ thirdpartysupport/v93/appservers/index.html** and select the product name of your Web application server.

Database type for SAS Web Infrastructure Platform

If you want to use a database other than the SAS Framework Data Server to store SAS Web Infrastructure Platform data, then choose the type of database here. In SAS 9.3, the following third-party databases are supported: DB2, MySQL, Oracle, PostgresSQL, and SQLServer.

SAS Web Infrastructure Platform database properties

Enter the host name, fully qualified host name, or IP address for the host where the database is installed. Specify the port that the database server is listening to and the name of the database that will contain the SAS Web Infrastructure Platform tables.

Note: Third-party databases often have particular requirements that you need to know about, such as database name limits, minimum tablespace sizes and so on. If you have not already, make sure that you review "Configuring an Alternative Database for SAS Web Infrastructure Platform Services"

available at: `http://support.sas.com/resources/`
`thirdpartysupport/v93/appservers/`
`SharedServicesAlternativeDatabase.pdf`.

Choose **Automatically create tables and load data** to have the deployment wizard automatically create tables and load the selected pre-existing database with initial data.

Choose **Use Catalog** to indicate whether the database catalog needs to be specified in order to uniquely locate a table in the database. The database catalog should be specified if using one of the following databases: MySQL, SAS Framework Data Server, or SQL Server.

Choose **Use Schema Pattern** to indicate whether the database schema needs to be specified in order to uniquely locate a table in the database. The database schema should be specified if using either DB2 or Oracle.

In the case of MySQL, the SAS Web Infrastructure Platform configuration process will also create a new MySQL database in addition to creating tables and loading data. The new database is named according to the value specified in the **Database Name** field.

Note: If you are using MySQL, do not specify a pre-existing MySQL database or the configuration will fail. For more information, see "Configuring an Alternative Database for SAS Web Infrastructure Platform Services" available at: `http://support.sas.com/resources/`
`thirdpartysupport/v93/appservers/`
`SharedServicesAlternativeDatabase.pdf`.

For more information, see "JDBC Data Sources" in Chapter 4 of *SAS Intelligence Platform: Middle-Tier Administration Guide*.

SAS Web Infrastructure Platform JDBC Properties
Enter the user account and its password for accessing the database used with your SAS Web Infrastructure Platform tables.

If you have selected to automatically configure the SAS Web Infrastructure Platform database, this user account must have the ability to create tables and insert records. If you are not automatically configuring the SAS Web Infrastructure Platform database, this user account must have the ability to insert, update, and delete records. The default user account is the SAS Administrator account (sasadm@saspw). For more information, see "JDBC Data Sources" in Chapter 4 of *SAS Intelligence Platform: Middle-Tier Administration Guide*.

In the **Directory containing JDBC driver jars** fields, enter the appropriate JDBC driver jars and your selected RDBMS database and version. Inappropriate or additional jar files will cause configuration failures, so just copy the minimum required jars to the JDBC driver jars directory.

SAS Web Infrastructure Platform: Database Metadata
Specify the database catalog or schema if necessary to uniquely query table metadata from the SAS Web Infrastructure Platform database.

Web Application Server: Automatic Deployment
Select to automatically deploy SAS 9.3 Web applications to the Web application server. For more information, see "Choose Whether to Automatically Deploy the SAS Web Applications" on page 65.

Regardless of whether you choose to automatically deploy your SAS Web applications, when building Web applications, the wizard also automatically explodes Web application archive files (.EAR files).

If you choose not to automatically deploy SAS Web applications, the deployment wizard writes manual deployment instructions to Instructions.html during the Web application deployment stage, that you will need to complete after the wizard finishes executing. For more information, go to:**http:// support.sas.com/resources/thirdpartysupport/v93/ appservers/index.html** and select the product name of your Web application server.

External Account: Web Application Server Administrator
You are prompted for this information if your site uses the WebSphere or WebLogic Web application server. Enter the user ID and password for the administrator account for either the WebSphere Application Server or the WebLogic Server. On Windows, be sure to enter a domain-qualified user ID.

- For WebSphere, the Web application server administrator user ID is the administrator account specified when WebSphere Admin Security was enabled.

- For WebLogic, the Web application server administrator user ID is used to configure the WebLogic default security realm. When the deployment wizard automatically configures your Web application server, the wizard uses these credentials to create the administrator account and the WebLogic domain.

  If you choose to manually configure your Web application server, you will need to create this administrator account (using the credentials that you define here) with the WebLogic administrative tools.

For more information about configuring Web application servers to support the SAS middle tier, go to: **http://support.sas.com/resources/ thirdpartysupport/v93**and select "IBM WebSphere" or "Oracle WebLogic".

Web Application Server: Proxy Information
If you are using SAS Information Delivery Portal RSS feeds, then you will have to provide proxy server information. Enter the fully qualified host name for the proxy server and its port that your site uses to access the Internet.

For **NonProxy Hosts**, enter the DNS names of all the machines that should not be accessed through the proxy server. Be sure to include other machines where application servers are configured as part of a common WebLogic Domain or are part of a WebSphere cell. Separate each machine name with a vertical line character (|). Use an asterisk (*) as a wildcard for an entire subnet. For example, *.subnet.com excludes all machines with a DNS name that ends with .subnet.com.

If your site does not allow Internet access on production systems, refer to configuration information available at this SAS Web site: **http:// support.sas.com/resources/thirdpartysupport/v93** and select your Web application server.

WebSphere Application Server: Node
In **Profile Name**, enter a profile name, or accept the default (SAS*hostname*01). The profile name is used for the directory that contains the node agent and the SAS Web application server.

The node agent name is required, but cannot be configured using the deployment wizard.

In **Node Name**, enter a node name or accept the default (SAS*hostname*Node). The node name is the WebSphere node that contains one or more of the Web application servers.

In **Additional JVM Options**, enter any additional Java options that you want the Web application servers to use.

IP Multicast

Accept these IP multicast settings or enter new ones.

A multicast group communications protocol is used to communicate among middle-tier SAS applications in a single SAS deployment (the set of applications connected to the same metadata server). The combination of multicast IP address and multicast UDP port should be different for each SAS deployment and also different from those used by other multicast applications at your site. The defaults are most appropriate for deployments in a firewall-isolated data center environment.

For more information, see "Designating Ports and Multicast Addresses" on page 20.

SAS Remote Services Application: JVM

Enter the desired initial heap size for the remote services application using the JVM option format.

In **Max JVM Heap Size**, enter the desired maximum heap size for the remote services application using the JVM option format.

In **Additional JVM Options**, enter any additional Java options that you want the Remote Services VM to use. For example, you might want to add `-Dmulticast_udp_ip_ttl=1` to restrict multicast traffic to a single subnet based on your network topology.

For more information, see *SAS 9.3 Web Applications: Tuning for Performance and Scalability* available at: **http://support.sas.com/resources/ thirdpartysupport/v93/appservers/ WebTierScalabilityAndPerformance.pdf**.

SAS Information Delivery Portal unchallenged access

When unchallenged access is enabled, users can access the portal and interact with selected content without providing a user ID and password.

Enter a user ID that SAS will use to grant unchallenged access to portal users. On Windows, be sure to qualify the user ID as appropriate (for example, **myDomain \sasguest**).

Deselect **Display Search Menu for Unchallenged Access** if you want to suppress the search link from displaying in the main portal banner.

Specify what should appear in the portal banner for unchallenged users:

- **logoff**

  Display the Log Off link.

- **logon**

  Display the Log On link (which users can click to display the SAS Logon Manager).

- **hide**

  Hide the Log Off and Log On links.

For more information, see "Enabling Unchallenged Portal Access" in Chapter 10 of *SAS Intelligence Platform: Web Application Administration Guide*.

SAS Web Report Studio: Scheduling
Choose whether to enable scheduling for SAS Web Report Studio. If Platform Suite for SAS is in your deployment plan, then you have a choice between using Platform Process Manager, provided by Platform Computing, Inc., or SAS In-Process Services.

For more information, see Chapter 2, "Setting Up Scheduling Using Platform Suite for SAS," in *Scheduling in SAS* or Chapter 5, "Setting Up Scheduling Using SAS In-Process Scheduling," in *Scheduling in SAS*

SAS Content Server: Repository Directory
Enter the location on the disk for the actual contents of the content repository.

Select **Use configured database for content storage** if you want to store SAS Content Server content in the SAS Web Infrastructure Platform database instead of the file system. When this check box is selected, the path identified in the **Repository Directory** is used to store configuration files and indexes only. (Selecting the SAS Web Infrastructure Platform database type is discussed earlier on page 114.)

For more information, see Chapter 9, "Administering the SAS Content Server," in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

SAS Web Parts for Microsoft SharePoint: Details
We recommend that you accept the defaults.

The Web URL is the address of the Web application where the SAS Web Parts solution is deployed.

The Site URL is the site collection where the feature is activated. A Web application can have multiple site collections, and a site collection can contain multiple sites. In most instances the URLs are the same (a site collection at the root of the web application), but they can also be different.

For more information, contact your site's SharePoint administrator.

The SAS User ID is the metadata identity that you use to implement shared identity mode. For more information, see "Configure User Access for SAS Web Parts for Microsoft SharePoint" on page 97.

DataFlux Data Management Server
In **DataFlux Data Management Server Name** enter the simple name of the DataFlux Data Management Server definition. (Do not use quotation marks.)

In **Host Name** enter the fully qualified host name for the machine that contains the DataFlux Management Server.

DataFlux Data Management Server: Server Component Name
In **Server Component Name** enter a name to uniquely identify this DataFlux Data Management Server in metadata. When the server starts, it searches for its definition in SAS metadata using this name.

33. When you see the Deployment Summary page, the deployment wizard has finished collecting installation and configuration input. This is the last opportunity to go back and change any information that you have provided in previous pages before the wizard begins writing to your system.

Make one of the following choices:

- Click **Start** to begin installing SAS files and writing the configuration to the current machine.

- Click **Back** to navigate to earlier wizard pages to change installation and configuration information previously entered.

- Click **Cancel** to terminate the wizard session. Note that you will lose installation and configuration information previously entered.
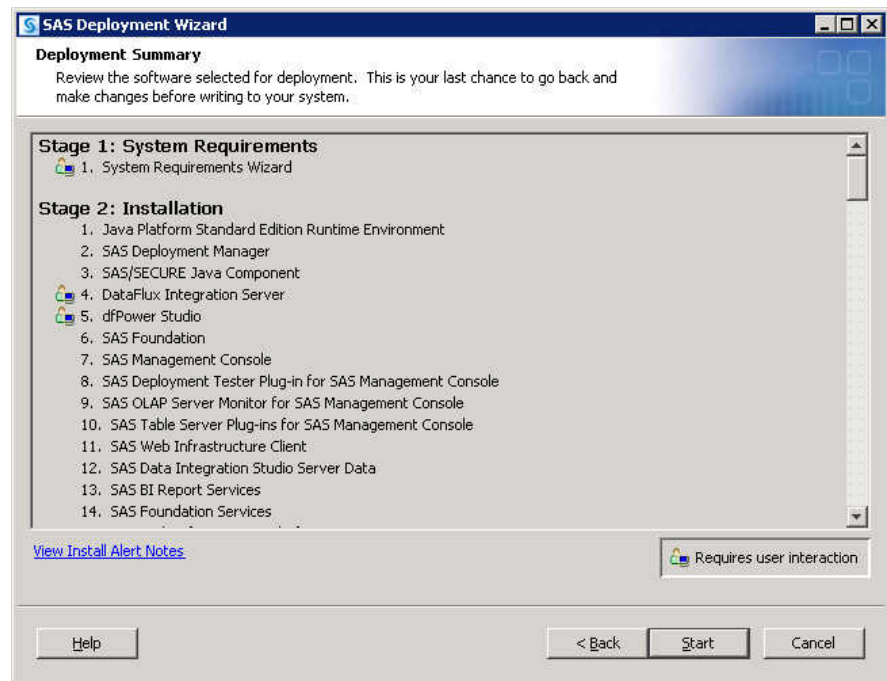
On UNIX, when you are installing the server tier, you will be instructed to run a script as root. As the message in the installation program explains, certain SAS products and features use functionality that requires SAS to check user ID authentication and file access authorizations. This in turn necessitates that certain files within your SAS installation have setuid permissions and be owned by root.

CAUTION:
 To avoid configuration failure, do not proceed until the script completes.

On Windows, the deployment wizard checks to make sure that your machine contains the minimum system requirements necessary to run SAS 9.3.

Sometimes, it is necessary to reboot your machine after the wizard has installed certain system components. When this occurs, the wizard prompts you to log back on to the machine, and continues to the next configuration step in your SAS deployment process.

Your credentials are temporarily stored in your Windows registry using the Windows auto logon functionality. In rare circumstances, it is possible those values will remain in your Windows registry after their use, thus posing a potential security risk.

For more information about this functionality, including any risks, please refer to Microsoft documentation about security and automatic logons. You should weigh the risks of convenience for automatic logon after restart against the security policies in place at your site.

When you see a page similar to the following, the SAS Deployment Wizard is finished:
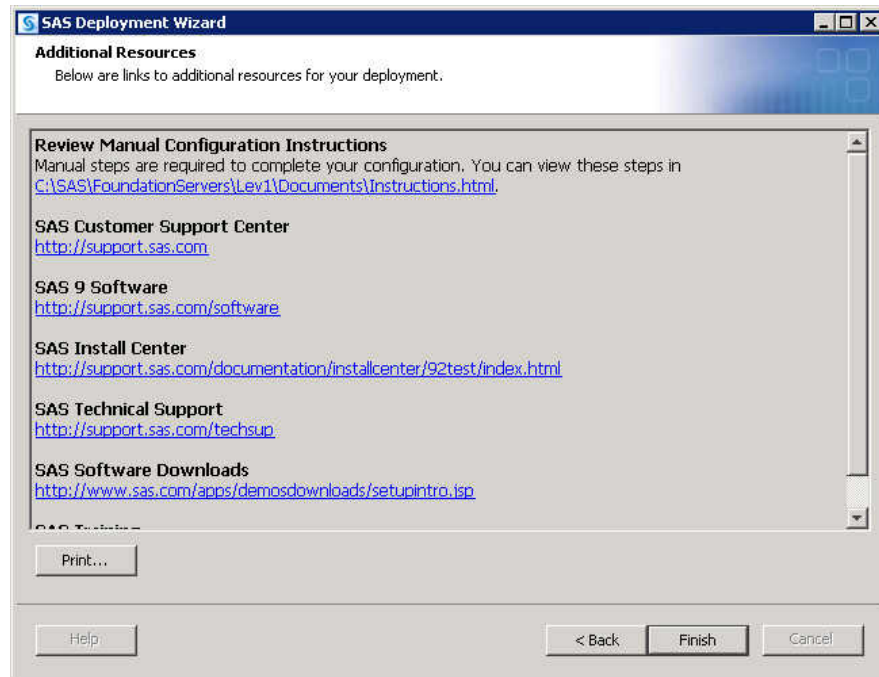
The deployment wizard has installed, configured, and started SAS processes on your machine.

34. Click **Review Manual Configuration Instructions** and complete any necessary manual configuration steps.

    The SAS Deployment Wizard writes the Instructions.html file to the **Documents** directory under the SAS configuration path. For example:

    • UNIX and z/OS:

      /opt/SAS/Lev1/Documents/Instructions.html

    • Windows:

      C:\SAS\Config\Lev1\Documents\Instructions.html

35. Click **Finish** to close the deployment wizard.

36. For multi-machine deployments, back up your metadata repository and your SAS configuration directory before you run the SAS Deployment Wizard on the next machine called for by your deployment plan.

    • Make a backup copy of your SAS 9.3 configuration directories by using your site-approved method. Your SAS configuration directories are all the child directories beneath the path that you specified earlier in this procedure on the **Specify Configuration Information** wizard page.

    • Back up your Web application server directories.

    • Back up your metadata repository and repository manager on the SAS Metadata Server machine. For more information, see Chapter 11, "Best Practices for Backing Up and Restoring Your SAS Content," in *SAS Intelligence Platform: System Administration Guide*.

37. If you are deploying a middle-tier machine and opted not to automatically deploy your SAS Web applications, then you must manually deploy them. For more information, go to the Third-Party Software Downloads site at: **http://support.sas.com/resources/thirdpartysupport/v93/appservers/index.html** and select the product name of your Web application server.

38. When you have completed any manual configuration tasks, and you have made the necessary backups, repeat the steps listed in this topic on each machine defined in your deployment plan.

39. Be sure to restart any servers that you stopped for purposes of creating a backup.

40. When you are finished installing and configuring SAS on each machine called for in your deployment plan, proceed to the next section.

Validate the SAS 9.3 Servers

There are a few simple steps required to confirm that the various SAS servers that you have deployed are running properly. The following table summarizes server validation information:

Table 5.2 *Validation Summary for the SAS Server Tier*

Server	Validation Method
Metadata server	Successful login using the SAS Management Console.
Metadata utility (SASMeta) workspace server	The metadata utility workspace server can be used only by those members of the SAS Administrators group who have an external account that is known to the server's host and is associated with their SAS identity. If the server is on Windows and uses credential-based host authentication, the account must have the **Log on as a batch job** user right.
	Right-click the validate command in SAS Management Console using external account credentials that meet the criteria described above. Default path:
	Server Manager ⇨ SASMeta ⇨ Logical Workspace Server.
Object spawner	If either the stored process server or one of the workspace servers validates (see below), then the object spawner is running.
OLAP server	Right-click the validate command in SAS Management Console. Default path:
	Server Manager ⇨ SASApp ⇨ Logical OLAP Server.[*]
Pooled workspace server	Right-click the validate command in SAS Management Console. Default path:
	Server Manager ⇨ SASApp ⇨ Logical Pooled Workspace Server.[*]
Stored process server	Right-click the validate command in SAS Management Console. Default path:
	Server Manager ⇨ SASApp ⇨ Logical Stored Process Server.[*]
Workspace server	Right-click the validate command in SAS Management Console using external account credentials. Default path:
	Server Manager ⇨ SASApp ⇨ Logical Workspace Server.[*]

Server	Validation Method
DATA step batch server	Successful launch of SAS when running the sasbatch script (Windows and UNIX). On z/OS, use the Schedule Manager's Deploy SAS DATA Step Program to browse the appserver_autoexec_usermods.sas file created in the AppServer context.
Grid server	Successful launch of the grid test program, available at: **http://support.sas.com/rnd/scalability/grid/gridfunc.html#testprog**. For more information, see "Verifying SAS Job Execution" in Chapter 7 of *Grid Computing in SAS*.

* Use the value that you entered during the deployment for the server context name. The *default* is SASApp.

This procedure is meant to provide validation for an out-of-the-box, basic deployment. For more complex server configurations, please refer to the appropriate SAS documentation for the server in question.

To validate the SAS server tier that has been deployed using the SAS Deployment Wizard, follow these steps:

1. Log on to the machine hosting one or more SAS servers.

2. Start SAS Management Console, using the following command for the appropriate operating system:

    • Windows:

       Start menu ⇨ Programs ⇨ SAS ⇨ SAS Management Console 9.3

    • UNIX:

       Enter the following command:

       *SAS-installation-directory***/sasmc**

       For example:

       /opt/sas/SASManagementConsole/9.3/sasmc

    • z/OS:

       Use a Windows or UNIX machine on which SAS Management Console is installed and connect to the z/OS machine(s) where the SAS 9.3 server tier is running.

3. Log on to the metadata server using a set of valid credentials, such as for the SAS Administrator.

4. In SAS Management Console, on the Plug-ins tab, expand the **Server Manager** node.

5. Expand the SAS Application Server node. (The default name is **SASApp**.)

6. Highlight the server that you want to validate, such as the **SASApp - Logical OLAP Server**.

7. Right-click the highlighted server, and select **Validate**.

    You should see the following message:Validation Successful!

8. Repeat steps 6 and 7 for the other SAS servers:

    • pooled workspace server

- stored process server
- workspace server

9. When validating the workspace server, if you are prompted for credentials, we suggest that you enter the credentials for the SAS Spawned Servers account (sassrv). Alternatively, you can enter a user ID and password that meet all of these requirements:

   - The account is known to the host of the workspace server.

     (An ID that ends in @saspw does not meet this requirement.)

   - The account has the Windows right **Log on as a batch job** (if the server is on Windows).

   - The account has a corresponding metadata identity.

10. To validate the DATA step batch server on Windows and UNIX, SAS should successfully launch when you run the following command, appropriate for the server host operating system:

    - Windows:

      Start menu ⇨ Run ⇨ *SAS-configuration-directory*\sasbatch.bat

      For example:

      Start menu ⇨ Run ⇨ C:\SAS\AllServers\Lev1\SASApp\BatchServer\sasbatch.bat

    - UNIX:

      Enter the following command:

      SAS-configuration-directory/**SASApp/BatchServer/sasbatch.sh**

      For example:

      /opt/sas/AllServers/Lev1/SASApp/BatchServer/sasbatch.sh

11. To validate the DATA step batch server on z/OS, use the Schedule Manager's Deploy SAS DATA Step Program to browse the appserver_autoexec_usermods.sas file created in the AppServer context. When the JCL pane comes up and contains JCL, the deployment of the batch server is successful.

    a. From SAS Management Console, right-click the Schedule Manager plug-in (**Plug-ins** tab) and choose **Deploy SAS DATA Step Program**.

    b. Click **Browse** and navigate to the appserver_autoexec_usermods.sas file under a server context such as SASApp (for example, *SAS-configuration-directory*/**Lev*n*/SASApp**).

    c. You should see JCL in the bottom list box.

12. To verify that your grid servers are operational, follow the steps located in, see "Verifying SAS Job Execution" in Chapter 7 of *Grid Computing in SAS*.

13. Repeat these steps on each machine in your deployment plan on which you have deployed one or more SAS servers.

About SAS Deployment Tester

SAS 9.3 is shipped with a SAS Management Console plug-in that you can use to test your SAS deployment. For more information, see the SAS Management Console Help for the SAS Deployment Tester and Chapter 7, "Using the Deployment Tester," in *SAS Intelligence Platform: System Administration Guide*.

Automating the SAS Installation on Multiple Machines

Overview of Automating the SAS Installation on Multiple Machines

The following topics are contained in this section:

- "Overview of Automating the SAS Installation on Multiple Machines" on page 124
- "Recording a SAS Deployment Wizard Response File" on page 125
- "Playing Back a SAS Deployment Wizard Response File" on page 126
- "Verifying the Playback Install" on page 130
- "Monitoring the SAS Deployment Wizard during Playback" on page 131
- "More about Monitoring the SAS Deployment Wizard on UNIX and z/OS" on page 131

Overview of Automating the SAS Installation on Multiple Machines

The SAS Deployment Wizard provides a record and playback feature that enables you to automate a SAS installation across multiple machines. This feature is designed for large-scale enterprise deployments where SAS 9.3 clients need to be deployed across many machines. Using the record and playback feature prevents users from having to manually provide input on every page every time the SAS Deployment Wizard is run on a machine.

Note: For information about provisioning SAS, see **http://support.sas.com/kb/50/815.html**.

Starting with the March 2012 release of SAS 9.3, the deployment wizard can be run on operating systems that do not have windowing systems. For more information, see the *SAS Deployment Wizard and SAS Deployment Manager User's Guide*, available at: **http://support.sas.com/documentation/installcenter/en/ikdeploywizug/64204/PDF/default/user.pdf**.

The SAS Deployment Wizard can be run in one of the three playback modes. Each requires you to launch the wizard from the command line with a particular option. After the wizard finishes, you review the log file to verify that the installation completed successfully. Users can choose among three levels of automation when playing back a SAS Deployment Wizard response file.

Note: This same record and playback mechanism also works for the SAS Deployment Manager to automate configuration actions across multiple machines in a SAS deployment.

CAUTION:
> **If you choose to use the deployment manager's record and playback mechanism to perform a task that involves passwords, passwords are written to the response file. For greater security, delete the response file (or remove the passwords from the response file) when you are finished. A response file is present only if you use the record and playback mechanism, instead of completing the task manually as documented in the preceding steps.**

The following summarizes the SAS Deployment Wizard record and playback process:

1. Create a response file.

   Run the SAS Deployment Wizard once in record mode to create a response file. SAS is not installed or configured; the only output is a response file.

   See "Recording a SAS Deployment Wizard Response File" on page 125.

2. Play back the response file to install SAS.

   Run the SAS Deployment Wizard to install and configure SAS using the values you previously recorded in the response file.

   See "Playing Back a SAS Deployment Wizard Response File" on page 126.

3. Verify that the installation completed successfully.

   Check the SAS Deployment Wizard log file for the presence of any errors.

   See "Verifying the Playback Install" on page 130.

Recording a SAS Deployment Wizard Response File

To use the SAS Deployment Wizard in playback mode, your first step is to create a response file. A *response file* is a text file that contains values for the SAS Deployment Wizard to use to install and configure SAS when running in one of the three playback modes. You create a response file by running the SAS Deployment Wizard in record mode. While in record mode, you interact with the SAS Deployment Wizard as if you are installing and configuring SAS. However, the SAS Deployment Wizard does not install or configure any software while in record mode. The only output is the response file.

The SAS Deployment Wizard stores any passwords that you choose to record in the response file using a fixed-key, 32–bit proprietary encryption algorithm.

The SAS Deployment Wizard resides at the root of the SAS Software Depot directory, or on the root of the SAS media that you are installing from. The following command runs the SAS Deployment Wizard in record mode:

- Windows:

  `setup.exe -record`

- UNIX:

  `setup.sh -record`

- z/OS:

  `setup.rexx -record`

Note: While in quiet mode, if the deployment wizard encounters errors or missing parameters, it halts the SAS deployment.

To run the SAS Deployment Wizard, you must be a user who is known to the target machine and who will be available for the long term (to perform future SAS maintenance). On Windows, the installer user should be a member of the Administrators group; on UNIX, use the same account on all machines. For more information, see "Required External User Accounts for SAS" on page 8.

By default, the SAS Deployment Wizard names the response file sdwresponse.properties and writes the file to the current user's home directory. For example, the default path and filename on Windows is as follows:

C:\Documents and Settings***current-user***sdwresponse.properties

To specify a response file that does not use the default name, use the **-responsefile** option. For example, on Windows that you might enter a command similar to this:

```
setup.exe -record -responsefile
"C:\my_files\response.properties"
```

If you want, you can force the wizard to deploy SAS during recording mode by using the **-deploy** option. For example, on Windows, you might enter a command similar to this:

```
setup.exe -record -deploy -responsefile
"C:\my_files\response.properties"
```

For information about verifying your deployment, see "Verifying the Playback Install" on page 130.

Playing Back a SAS Deployment Wizard Response File

Overview of Playing Back a SAS Deployment Wizard Response File

There are three playback modes that give users varying levels of automation with the SAS Deployment Wizard:

Table 5.3 Playback Modes for the SAS Deployment Wizard

Mode	Level of Automation	Description
Quiet	High	No visual feedback from the SAS Deployment Wizard. See "Installing SAS in Quiet Mode" on page 127.
Partial prompt	Medium	Users only see SAS Deployment Wizard pages for values not contained in the response file. See "Installing SAS in Partial Prompt Mode" on page 129.
Full prompt	Low	Users see all SAS Deployment Wizard pages with response file values supplied. Users can confirm these values or change them. See "Installing SAS in Full Prompt Mode" on page 129.

Best Practices for Response File Playback

When playing back a SAS Deployment Wizard response file, keep these best practices in mind:

- Use response files on other machines with caution.

  Remember that recording a deployment captures responses that represent the machine on which you have recorded the deployment. Machines are not identical. Therefore, SAS recommends that response files be used on other machines with caution.

- Don't use response files from other SAS orders.

  New deployment options can be introduced with updates to the SAS order. A response file from an earlier order will not have data for these new deployment options. For this reason, SAS recommends that response files should be used only for software in the same order. Using a response file from one order while deploying another order may result in unintended discrepancies that might be difficult to troubleshoot.

- Use the same configuration prompting level.

  When using playback, the deployment wizard should be at the same level of configuration prompting as was used in record mode. Manual revision of the response file should be attempted only with extreme caution by users with experience with SAS configuration or with the aid of a SAS consultant or Technical Support.

Installing SAS in Quiet Mode

The SAS Deployment Wizard gives you flexibility in how you automate the SAS installation. The highest level of automated installation is running the SAS Deployment Wizard in quiet mode. In quiet mode, there is no user interface in which you provide installation inputs. The SAS Deployment Wizard uses inputs that you have already provided in the form of a response file to determine how to install and to configure SAS.

Note: If any errors or missing parameters are encountered in quiet mode, the deployment wizard halts the deployment.

The following command runs the SAS Deployment Wizard in quiet playback mode:

- Windows:

  setup.exe -quiet -wait

  Note: On Windows, you might also want to specify restart options. For more information, see "Managing a Machine Reboot during Playback (Windows)" on page 128.

- UNIX:

  setup.sh -quiet

- z/OS:

  setup.rexx -quiet -wait

Note: For information about **-wait**, see "Monitoring the SAS Deployment Wizard during Playback" on page 131.

To run the SAS Deployment Wizard, you must be a user who is known to the target machine and who will be available for the long term (to perform future maintenance). On Windows, the installer user should be a member of the Administrators group; on UNIX, use the same account on all machines. For more information, see "Required External User Accounts for SAS" on page 8.

When running in quiet mode, the SAS Deployment Wizard's default action is to look for its response file by default in the current user's home directory. For example, the default path and filename on Windows is as follows:

`C:\Documents and Settings\`*current-user*`\sdwresponse.properties`

To specify a response file that does not use the default name, use the **-responsefile** *absolute-pathname* option. For example, on Windows, you might enter a command similar to this:

```
setup.exe -quiet -responsefile
"C:\my_files\response.properties"
```

For Windows machines, in the event that the machine must be rebooted, use the restart options to avoid having to manually log back on to the machine. For example, you might enter a command similar to this:

```
setup.exe -quiet -responsefile
"C:\my_files\response.properties" -restartdomain mydomain -
restartuserid myuserid -restartpassword mypassword
```

See the following topics for more information:

- "Managing a Machine Reboot during Playback (Windows)" on page 128
- "Verifying the Playback Install" on page 130
- "Monitoring the SAS Deployment Wizard during Playback" on page 131

Managing a Machine Reboot during Playback (Windows)

During a deployment on Windows, the SAS Deployment Wizard runs the System Requirements Wizard to check the machine to make sure that it meets the minimum system requirements for SAS 9.3. If certain Microsoft system components that are required by SAS 9.3 are missing, the System Requirements Wizard shuts down the SAS Deployment Wizard, installs the missing components, and reboots the machine.

If you are playing back a response file in quiet mode, you should use the following options in order to log back on to the machine automatically and continue the SAS Deployment Wizard session:

-restartdomain*domain*
> specifies the authentication domain for the SAS installer user account.

-restartuserid*SAS-installer-ID*
> specifies the user account that you are logged in under to run the SAS Deployment Wizard to deploy SAS 9.3.

-restartpassword*password*
> specifies the password for the specified user account.

For example, you might enter a command similar to this:

```
setup.exe -quiet -wait -responsefile
"C:\my_files\response.properties" -restartdomain mydomain -
restartuserid myuserid -restartpassword mypassword
```

Note: The values entered by using the -restart* command line options are temporarily stored in your Windows registry using the Windows auto logon functionality. In rare circumstances, it is possible those values will remain in your Windows registry after their use, thus posing a potential security risk. For more information about this functionality, including any risks, please refer to your Microsoft documentation about security and automatic logons on their Web site. You should weigh the risks of

convenience for automatic logon after restart against the security policies in place at your site.

Installing SAS in Partial Prompt Mode

The SAS Deployment Wizard gives you flexibility with how you automate the SAS installation. You can fully automate the SAS installation (quiet mode), or you can pick and choose certain parts of the installation to automate (partial prompt mode).

When you run the SAS Deployment Wizard in partial prompt mode, the user sees only those wizard pages for which there are no response file values. There might be situations where it is permissible to automate most of the installation inputs but necessary to prompt for certain sensitive pieces of information. For example, storing user account credentials—even in an encrypted form—might violate a site's corporate security policy. It would require the user to interact with the SAS Deployment Wizard for those pages where user account credentials are entered.

The SAS Deployment Wizard resides at the root of the SAS Software Depot directory, or on the root of the SAS media that you are installing from. The following command runs the SAS Deployment Wizard in partial prompt playback mode:

* Windows:

  `setup.exe -partialprompt`

* UNIX:

  `setup.sh -partialprompt`

* z/OS:

  `setup.rexx -partialprompt`

To run the SAS Deployment Wizard, you must be a user who is known to the target machine and who will be available for the long term (to perform future maintenance). On Windows, the installer user should be a member of the Administrators group; on UNIX, use the same account on all machines. For more information, see "Required External User Accounts for SAS" on page 8.

When running in partial prompt mode, the SAS Deployment Wizard's default action is to look for its response file by default in the current user's home directory. For example, the default path and filename on Windows is as follows:

`C:\Documents and Settings\`*current-user*`\sdwresponse.properties`

To specify a response file that does not use the default name, use the **`-responsefile`** option. For example, on Windows, you might enter a command similar to this:

`setup.exe -partialprompt -responsefile`
`"C:\my_files\response.properties"`

For more information, see "Verifying the Playback Install" on page 130.

Installing SAS in Full Prompt Mode

There are three levels of automation from which you can choose when running the SAS Deployment Wizard in playback mode: quiet, partial prompt, and full prompt. Full prompt mode is the least automated of the three modes. When running in full prompt mode, the SAS Deployment Wizard requires user confirmation for all of its pages. However, in full prompt mode, the user is prompted with *default* values that are stored in the response file.

The SAS Deployment Wizard resides at the root of the SAS Software Depot directory, or on the root of the SAS media that you are installing from. The following command runs the SAS Deployment Wizard in full prompt playback mode:

- Windows:

  setup.exe -responsefile *absolute-pathname*

- UNIX:

  setup.sh -responsefile *absolute-pathname*

- z/OS:

  setup.rexx -responsefile *absolute-pathname*

To run the SAS Deployment Wizard, you must be a user who is known to the target machine and who will be available for the long term (to perform future maintenance). On Windows, the installer user should be a member of the Administrators group; on UNIX, use the same account on all machines. For more information, see "Required External User Accounts for SAS" on page 8.

When running in full prompt mode, the SAS Deployment Wizard expects you to specify a path and filename to a valid response file. For example, on Windows enter the following command:

setup.exe -responsefile "C:\my_files\response.properties"

For more information, see "Verifying the Playback Install" on page 130.

Verifying the Playback Install

When running in quiet mode, the SAS Deployment Wizard logs the following message after a successful completion:

Deployment completed successfully

If the SAS Deployment Wizard encounters an incorrect or a missing input in the response file, it records a message in its log file and returns an error code of -1. The SAS Deployment Wizard log file resides in the following location:

- Windows:

  C:\Documents and Settings*current-user*\Local Settings \Application Data\SAS\SAS Deployment Wizard\SDW.log

- UNIX and z/OS:

  ~/.SASAppData/SASDeploymentWizard/9.3/SDW.log

Use the **-loglevel** *n* option to control the amount of information written by the SAS Deployment Wizard to its log. A change in the logging level is in effect for the current SAS Deployment Wizard invocation only. If you do not specify a log level, then the wizard uses the default (zero). *n* can be one of the following three values:

0

   (default) specifies the least amount of information written to the log. Zero is acceptable for most SAS Deployment Wizard sessions.

1

   specifies a medium amount of information written to the log. This value is generally used when working with SAS Technical Support to troubleshoot deployment issues.

2

> specifies the greatest amount of information written to the log and should not be specified except when instructed to by SAS Technical Support.

For example, on Windows, to increase the SAS Deployment Wizard logging level, you might enter a command similar to this:

```
setup.exe -partialprompt -responsefile
"C:\my_files\response.properties" -loglevel 1
```

Monitoring the SAS Deployment Wizard during Playback

Running the SAS Deployment Wizard in quiet mode provides the sought-after effect of suppressing the wizard's user interface. One drawback with the quiet mode is not being able to see the interface, which enables you to monitor the install and to see whether any errors occur. To address this concern, you can use the Task Manager on Windows or periodically issue the **ps** command on UNIX and z/OS to track whether the SAS Deployment Wizard is running.

On Windows, specify the **-wait** option when invoking the SAS Deployment Wizard in quiet mode to cause setup.exe to display and remain in the Windows Task Manager process list.

For example:

```
setup.exe -quiet -wait -responsefile "C:\my_files\
response.properties"
```

If you did not use **-wait**, monitor the process named **java.exe**.

Note: Use of network management software (such as SMS or Tivoli) might require you to use the **-wait** option when running the SAS Deployment Wizard in quiet mode in order for such software to determine when the SAS Deployment Wizard finishes executing. Refer to your network management platform documentation for more information.

On UNIX and z/OS, as with most processes, you issue the **ps** command to monitor the SAS Deployment Wizard running in quiet mode. For more information, see "More about Monitoring the SAS Deployment Wizard on UNIX and z/OS" on page 131.

More about Monitoring the SAS Deployment Wizard on UNIX and z/OS

Remember that output from a **ps** command can be misleading because the process name returned is not always named **setup.sh**. The name might differ because the actual script that the SAS Deployment Wizard is running at any given time varies. However, the process ID remains the same.

For example, if you were to run the SAS Deployment Wizard and immediately issue a **ps** command (before the language dialog box would be displayed), you would see output similar to this:

```
31762 pts/2 S 0:00 /bin/sh /depot/setup.sh
```

Note that the shell, **/bin/sh**, runs the initial script, **/depot/setup.sh**. The shell is the parent process, and in this example has a process ID of 31762. When **setup.sh** is finished executing, it passes control to the script, **deploywiz.sh**. If you were to look at the process list while the SAS Deployment Wizard is running, you would see something similar to the following in a process list:

```
31762 pts/2 S
0:00 /bin/sh/tmp/_setup31762/products/deploywiz__9220__prt__
xx__sp0__1/deploywiz.sh -startuplocation /depot -
templocation /tmp/_setup31762
```

The shell **/bin/sh** is still running and retains the same process ID. However, this shell is running a different script now, **deploywiz.sh**.

Chapter 6
What to Do Next: Administration Tasks

Overview of Administration Tasks

Before you perform the administration tasks that are outlined in this chapter, you should have successfully completed the following tasks:

- Use the SAS Deployment Wizard to install and configure your software on each machine in your environment.

- Complete the post-installation tasks that are described in your **Instructions.html** file, which is located in the **Documents** subdirectory of your configuration directory. These tasks include performing manual configuration steps (if applicable), validating your SAS servers, validating your Web applications, and backing up your system.

After the SAS Intelligence Platform has been installed, configured, and validated, you will have a functional system. You can now begin performing administration tasks that are necessary to fully implement the SAS Intelligence Platform in your environment. These include the following categories of tasks:

- "First-Priority Setup Tasks" that are necessary to protect the integrity of your system. You should perform these tasks first, as soon as possible after you have completed your installation.

- "Standard Setup Tasks" that enable the users in your organization to begin using SAS Intelligence Platform client applications to access and analyze your data.

- "Optional Setup Tasks" that you might want to perform to address specific requirements in your environment.

- "Ongoing System Administration Tasks" to keep the SAS Intelligence Platform operational.

First-Priority Setup Tasks

Summary of First-Priority Setup Tasks

The following tasks are necessary to protect the integrity of your system. Complete these steps as soon as possible after installation, before you complete any of the other tasks that are outlined in this chapter.

Table 6.1 *First-Priority Setup Tasks*

Task	Description
Secure the SAS configuration on each server machine.	For a secure deployment, the configuration directory on each server machine must be protected by operating system controls. These controls will prevent inappropriate access to repository data sets, server scripts, server logs, and configuration files.
	On Windows systems, all configuration directories, files, and scripts are owned by the user who performs the installation. You must update the permissions as shown in "Recommended Operating System Protections for Windows Machines" on page 135. These recommendations assume that your SAS servers and spawners run as services under the Local System account.
	On UNIX and z/OS systems, the SAS Deployment Wizard automatically applies the appropriate permissions. The default permissions are shown in "Default Operating System Protections for UNIX and z/OS Machines" on page 137.
Establish a formal, regularly scheduled backup process.	Establish a formal, regularly scheduled backup process that includes your metadata repositories as well as the associated physical files.
	The SAS 9.3 Metadata Server includes a new server-based facility that performs metadata server backups automatically on a scheduled basis. By default, a schedule of daily backups is configured by the SAS Deployment Wizard. As a best practice, you should modify your backup configuration to specify a storage device other than the device that is used to store the metadata repositories and the server configuration files, and you should be sure to include this backup location in your regular system backups. See "Backing Up and Recovering the SAS Metadata Server" in Chapter 12 of *SAS Intelligence Platform: System Administration Guide*.
	It is important to also back up the physical data that is associated with the metadata so that related information will be synchronized if a restore becomes necessary. For guidance in setting up a backup process, see "Best Practices for Backing Up and Restoring Your SAS Content" in Chapter 11 of *SAS Intelligence Platform: System Administration Guide*.

Recommended Operating System Protections for Windows Machines

On Windows server machines, we recommend that you apply the following operating system protections to your configuration directory. All of these directories are located in *SAS-configuration-directory***\Lev1**.

Table 6.2 *Recommended Operating System Protections on Windows*

Directories	Users	Recommended Permissions
SAS-configuration-directory	SYSTEM and Administrators	Full Control
	All other users	List Folder Contents, Read
SAS-configuration-directory\Lev1	SYSTEM and Administrators	Full Control
	SAS Spawned Servers (sassrv)	On Windows Vista, Windows 7, and Windows Server 2008: Special Permissions to read and execute[*] On Windows XP: Read and Execute[*]
	All other users	List Folder Contents, Read
Lev1\SASApp	SYSTEM and Administrators	Full Control
	SAS Spawned Servers (sassrv)	Windows Vista, Windows 7, and Windows Server 2008 only: Special Permissions to read and execute[*]
	All other users	List Folder Contents, Read
Lev1 subdirectories: **Documents**, **ReportBatch**, **SASMeta**, **Utilities**, **Web**	SYSTEM and Administrators	Full Control
	All other users	List Folder Contents, Read

Directories	Users	Recommended Permissions
Lev1 subdirectories: • **ConnectSpawner** • **Logs** • **ObjectSpawner** • **SASApp\OLAPServer** • **SASMeta\MetadataServer** • **FrameworkServer** • **ShareServer**	SYSTEM and Administrators	Full Control Remove all other users and groups
SASApp subdirectories : **PooledWorkspaceServer**, **StoredProcessServer**	SYSTEM, Administrators	Full Control
	SAS Spawned Servers (sassrv)	On Windows Vista, Windows 7, and Windows Server 2008 only: Read & Execute, List Folder Contents, and Read[*]
	All other users	No access
SASApp subdirectories : **PooledWorkspaceServer\Logs**, **StoredProcessServer\Logs**	SYSTEM, Administrators, and SAS Spawned Servers (sassrv)	Full Control[*]
SASApp subdirectories: • **ConnectServer\Logs** • **Data\wrsdist** • **Data\wrstemp** • **PooledWorkspaceServer\sasuser** • **StoredProcessServer\sasuser** • **WorkspaceServer\Logs** **SASMeta\WorkspaceServer\Logs**	SYSTEM, Administrators, and SAS Spawned Servers (sassrv)	Full Control
sasv9_meta.cfg file	SYSTEM and Administrators	Read and Write Remove all other users and groups

[*]   Effective with the second maintenance release for SAS 9.3, the SAS Deployment Wizard automatically sets these permissions for sassrv.

Note:

- These recommendations assume that your SAS servers and spawners run as services under the Local System account. If servers and spawners are run under a different account, then grant that account the permissions that are recommended for SYSTEM.

- You might have selected the custom installation option to place all of your log files in a single directory. If you selected this option, then you will need to grant the SAS Spawned Servers (sassrv) user Full Control of the central log destination (for example, *SAS-configuration-directory***Lev1\Logs**).

- If users will be using SAS Enterprise Guide to create stored processes, then the SAS Spawned Servers (sassrv) account must have Write access to the directory in which stored processes will be stored.

- If you enable logging for a workspace server, then you will need to grant all users of the workspace server Full Control of the log directory. (See "Create a Log File for Workspace Server Troubleshooting" in Chapter 9 of *SAS Intelligence Platform: System Administration Guide*).

For details about the configuration directory structure, see "Overview of the Configuration Directory Structure" in Chapter 2 of *SAS Intelligence Platform: System Administration Guide*.

Default Operating System Protections for UNIX and z/OS Machines

The following table shows the default operating system protections that are provided automatically for configuration directories on UNIX and z/OS machines. All of these directories are located in *SAS-configuration-directory*/**Lev1**.

Table 6.3 *Default Operating System Protections on UNIX and z/OS*

Directories	Users	Default Permissions
SAS-configuration-directory	SAS Installer	Read, Write, and Execute
SAS-configuration-directory/**Lev1** **Lev1** subdirectories: **Documents**, **ReportBatch**, **SASApp**, **SASMeta**, **Utilities**, **Web**	All other users	Read and Execute
Lev1 subdirectories: • **ConnectSpawner** • **Logs** • **ObjectSpawner** • **SASApp/OLAPServer** • **SASMeta/MetadataServer** • **FrameworkServer** • **ShareServer**	SAS Installer	Read, Write, and Execute
	All other users	No access
SASApp subdirectories : **PooledWorkspaceServer**, **StoredProcessServer**	SAS Installer	Read, Write, and Execute
	sas group	Read and Execute

Directories	Users	Default Permissions
SASApp subdirectories : • `ConnectServer/Logs` • `Data/wrsdist` • `Data/wrstemp` • `PooledWorkspaceServer/Logs` • `PooledWorkspaceServer/sasuser` • `StoredProcessServer/Logs` • `StoredProcessServer/sasuser` • `WorkspaceServer/Logs` `SASMeta/WorkspaceServer/Logs`	SAS Installer	Read, Write, and Execute
	sas group	Read, Write, and Execute
sasv9_meta.cfg file	SAS Installer	Read and Write
	All other users	no access

Note:

- Make sure that the SAS Spawned Servers account (sassrv) is a member of the sas group, which has the necessary permissions to server configuration files and log directories.

- You might have selected the custom installation option to place all of your log files in a single directory. If you selected this option, then you will need to grant either the sas group or the SAS Spawned Servers (sassrv) user Read, Write, and Execute permission on the central log destination (for example, *SAS-configuration-directory***/Lev1/Logs**).

- If users will be using SAS Enterprise Guide to create stored processes, then the SAS Spawned Servers (sassrv) account must have Write access to the directory in which stored processes will be stored.

- If you enable logging for a workspace server, then you will need to grant all users of the workspace server Read, Write, and Execute permission on the log directory. (See "Create a Log File for Workspace Server Troubleshooting" in Chapter 9 of *SAS Intelligence Platform: System Administration Guide*).

- For details about the configuration directory structure, see "Overview of the Configuration Directory Structure" in Chapter 2 of *SAS Intelligence Platform: System Administration Guide*.

Standard Setup Tasks

The following administration tasks are essential to enable the users in your organization to begin using SAS Intelligence Platform client applications to access and analyze your data.

Table 6.4 *Standard Setup Tasks*

Task	Description
Add users and manage access.	Standard security setup activities include the following: • creating SAS administrators and regular SAS users • managing access to metadata, data, and application functionality For details, see "Selected Tasks" in Chapter 4 of *SAS Intelligence Platform: Security Administration Guide*.
Establish connectivity to your data sources.	To enable the client applications in the SAS Intelligence Platform to access your data sources (including SAS data sets, third-party relational databases, and data from Enterprise Resource Planning systems), you must create metadata objects that represent your data. For example, to enable users to access data in a library of SAS data sets, you must define metadata objects that represent the SAS library and each of the tables in the library. For details, see "Connecting to Common Data Sources" in Chapter 2 of *SAS Intelligence Platform: Data Administration Guide*.
Set up your metadata folder structure.	SAS Intelligence Platform clients use a hierarchy of SAS folders to store metadata for content such as libraries, tables, OLAP schemas, jobs, information maps, and reports. The initial structure provides private folders for individual users and provides a separate area for shared data. Within these folders, you should create a customized folder structure that meets your specific needs. For details, see "Working with SAS Folders" in Chapter 17 of *SAS Intelligence Platform: System Administration Guide*. *Note:* Be sure to secure access to the folders as described in the *SAS Intelligence Platform: Security Administration Guide*.

Optional Setup Tasks

It might be necessary for you to modify your initial configuration to meet specific requirements in your environment. Optional administration and configuration tasks include the following.

Table 6.5 *Optional Setup Tasks*

Task	Description
Install sas.servers as a boot script.	On UNIX machines, you can choose to install the sas.servers script as a boot script so that the SAS servers will start automatically when you start the machine. The comments in the sas.servers script contain installation instructions that are specific to your operating environment. For details, see "Using the sas.servers Script on UNIX or z/OS to Start or Stop All Servers" in Chapter 5 of *SAS Intelligence Platform: System Administration Guide*.
Optimize the performance of the metadata server.	To optimize the performance of the metadata server, you might want to adjust the maximum number of threads used by the server. See "Configuring the Number of Threads Used by the Metadata Server" in Chapter 14 of *SAS Intelligence Platform: System Administration Guide*. For other performance-related tasks, see "Managing Metadata Server Memory" in Chapter 15 of *SAS Intelligence Platform: System Administration Guide*.

Task	Description
Modify the configuration of your processing servers.	The following are some server configuration changes that you might want to make for performance optimization or other reasons: • Define a cluster of load-balanced workspace servers in order to balance a load across workspace servers that you have installed on multiple hosts. This type of configuration is most useful when you have a large number of users (such as data integration specialists) using a workspace server for relatively long-running jobs. For details, see "Understanding Server Load Balancing" in Chapter 7 of *SAS Intelligence Platform: Application Server Administration Guide*. • Modify load balancing or algorithms for stored process servers and pooled workspace servers. For details, see "Understanding the Load-Balancing Algorithms" in Chapter 7 of *SAS Intelligence Platform: Application Server Administration Guide*. • If your SAS server metadata contains characters other than those typically found in the English language, then you must start your SAS server with an ENCODING= or LOCALE= system option that accommodates those characters. For details, see "Encoding and Locale Information" in the *SAS Intelligence Platform: Application Server Administration Guide*. • If you will be submitting large jobs (for example, JAVA GRAPH jobs) on z/OS servers, then you might need to specify a larger region size. For details, see "Managing Memory" in the *SAS Companion for z/OS*.
Optimize Web application performance.	For information about configuring middle-tier components for better efficiency and performance, see "Best Practices for Middle-Tier Configuration" in Chapter 2 of *SAS Intelligence Platform: Middle-Tier Administration Guide*.
Adjust server logging.	You can change your server configurations to obtain additional logging information for troubleshooting, performance management, or other purposes. For details, see "Administering Logging for SAS Servers" in Chapter 9 of *SAS Intelligence Platform: System Administration Guide* and *SAS Logging: Configuration and Programming Reference*.
Enable job and report scheduling.	To enable SAS scheduling features, you can install and configure scheduling software, configure operating system scheduling, or configure in-process scheduling. For details, see *Scheduling in SAS*.
Increase Java heap memory allocation for desktop applications.	To process large amounts of data, you might need to modify the Java heap memory allocation that is configured for SAS Management Console, SAS Data Integration Studio, SAS OLAP Cube Studio, and SAS Information Map Studio. see "Managing the Java Heap Used By Desktop Applications" in Chapter 2 of *SAS Intelligence Platform: Desktop Application Administration Guide*.
Set up change management for SAS Data Integration Studio users.	If you want to implement change management for SAS Data Integration Studio, then you must set up project repositories and at least one change-managed folder. For details, see Chapter 5, "Administering SAS Data Integration Studio," in *SAS Intelligence Platform: Desktop Application Administration Guide*.
Collect ARM log information for SAS Data Integration Studio batch jobs.	If you want to collect ARM log information for SAS Data Integration Studio jobs that are run on a batch basis, then you must enable logging for the batch server that executes the jobs. For details, see "Collecting ARM Log Information for SAS Data Integration Studio Jobs" in Chapter 9 of *SAS Intelligence Platform: System Administration Guide*.

Ongoing System Administration Tasks

The following table lists important system administration tasks that you need to perform on an ongoing basis to keep the SAS Intelligence Platform operational.

Table 6.6 *Ongoing System Administration Tasks*

Task	Documentation Reference
Start, stop, pause, resume, and refresh the servers that are used in the system.	"Operating Your Servers" in Chapter 5 of *SAS Intelligence Platform: System Administration Guide*
Check the status of a server of or of a metadata repository.	"Checking the Status of Servers" in Chapter 6 of *SAS Intelligence Platform: System Administration Guide*
Monitor the activity of servers.	"Monitoring the Activity of SAS Servers" in Chapter 8 of *SAS Intelligence Platform: System Administration Guide*
Perform regular full backups of the metadata server.	"Best Practices for Backing Up and Restoring Your SAS Content" in Chapter 11 of *SAS Intelligence Platform: System Administration Guide*
Use server logs and configure logging options.	"Administering Logging for SAS Servers" in Chapter 9 of *SAS Intelligence Platform: System Administration Guide* and *SAS Logging: Configuration and Programming Reference*
Create a new metadata repository.	"Managing SAS Metadata Repositories" in Chapter 16 of *SAS Intelligence Platform: System Administration Guide*
Promote individual metadata objects or groups of objects.	"Promotion Tools Overview" in Chapter 18 of *SAS Intelligence Platform: System Administration Guide*

Note: The preceding table includes only the tasks that are documented in this guide. Other important administration tasks are described in the following documents:

- *SAS Intelligence Platform: Security Administration Guide*. You can use Appendix 2, "Checklist for a More Secure Deployment," in *SAS Intelligence Platform: Security Administration Guide* to ensure that your environment remains secure on an ongoing basis.

- *SAS Intelligence Platform: Data Administration Guide*.

- *SAS Intelligence Platform: Application Server Administration Guide*.

- *SAS Intelligence Platform: Desktop Application Administration Guide*.

- *SAS Intelligence Platform: Middle-Tier Administration Guide*.

- *SAS Intelligence Platform: Web Application Administration Guide*.

- *Scheduling in SAS*.

- *SAS/SHARE User's Guide*.

- *SAS/CONNECT User's Guide*.

To access these documents, go to `http://support.sas.com/93administration`.

Best Practices for Ensuring the Integrity of Your System

Allow Only the Metadata Server to Access Your Metadata Repositories

The **MetadataRepositories** and **rposmgr** subdirectories, which are located in the SAS configuration directory, are critical to the operation of your system. These data sets contain metadata that defines your servers, users, access levels, enterprise data sources, and data structures. They also contain metadata for resources that are created and used by SAS applications, including information maps, OLAP cubes, report definitions, stored process definitions, and jobs.

To safeguard the integrity of your system:

- Never move, delete, modify, or directly read the data sets in the **MetadataRepositories** and **rposmgr** directories. These data sets should be accessed only by metadata server processes.

- Do not place other files in these directories.

- Maintain a daily schedule of metadata server backups, as described in "Backing Up and Recovering the SAS Metadata Server" in Chapter 12 of *SAS Intelligence Platform: System Administration Guide*.

Use Best Practices for Working with SAS Folders

The folders that appear in the **Folders** tab of SAS Management console are used by client applications to store business intelligence content and system information. Inappropriate renaming, deleting, or moving of these folders or their contents could cause client applications to malfunction.

When interacting with folders in SAS Management Console, be sure to follow the best practices that are provided in "Working with SAS Folders" in Chapter 17 of *SAS Intelligence Platform: System Administration Guide*. If you need to move or copy the contents of these folders, use the procedures that are provided in "Promotion Tools Overview" in Chapter 18 of *SAS Intelligence Platform: System Administration Guide*.

Use Usermods Files When Customizing Autoexec Files, Server Configuration Files, and Startup Scripts

If you need to customize a configuration file, autoexec file, or start-up script for a SAS server, do not directly modify the file or script. Instead, add your customizations to the corresponding file that is named **server-name**_usermods.cfg, autoexec_usermods.sas, **server-name**_usermods.bat, or **server-name**_usermods.sh.

Use of these files prevents your customizations from being overwritten when a new SAS release is installed.

Appendix 1

Configuration Options by Prompt Level

Overview of Configuration Options by Prompt Level

Shortly after you begin running the SAS Deployment Wizard to interactively install and initially configure SAS, you will be asked to choose between three wizard prompting levels:

Express
    displays the minimum number of wizard pages needed to complete the SAS configuration.

Typical
    displays the basic set of wizard pages needed to complete the SAS configuration.

Custom
    displays all the wizard pages needed to complete the SAS configuration.

Figure A1.1 *Select Configuration Prompting Level Page*
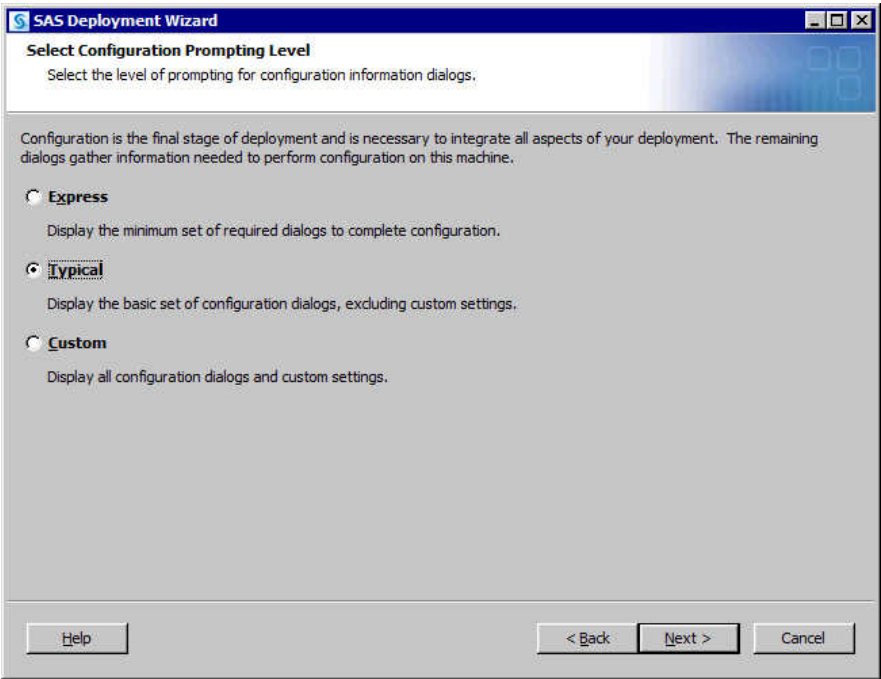
The table in "Configuration Options by Prompt Level" on page 144 lists the SAS Deployment Wizard pages found in these prompting levels.

Note: If you are deploying the SAS Framework Data Server, then the SAS configuration path should be a path local to the machine. The configuration path should not be on an NFS shared disk. If you want to put your configuration path on a shared disk, then you must make sure that you specify a local path for the Framework Data Server content directory. You can set the content directory on the Framework Data Server Invocation Options page. This option is available only on the custom configuration prompting level.

Configuration Options by Prompt Level

The following table lists the configuration options and the prompt level in which they display for the SAS Intelligence Platform only. Depending on your configuration, you might see differences for the prompt level in which a particular option displays. This is one example of a prompt level and configuration option mapping for a sample configuration.

Note: The configuration options that you encounter depend on which SAS products are identified in your deployment plan, and, in multiple machine deployments, the machine that you are currently deploying.

Table A1.1 *Configuration Options by Prompt Level*

Configuration Option in the SAS Deployment Wizard	Prompt Level That Displays the Option		
	Express	**Typical**	**Custom**
Configuration prompting level on page 106[*]	X	X	X
Configuration directory and level on page 107[*]	X	X	X
Migration on page 108[*]	X	X	X
Type of deployment accounts on page 109[*]	X	X	X
Installer account credentials on page 109[*]	X	X	X
Metadata server port and host name[**]	X	X	X
Unrestricted administrator account credentials on page 109[*]	X	X	X
Trusted user account credentials on page 109[*]	X	X	X
Anonymous Web user account credentials on page 110[*]	X	X	X
SAS spawned server account credentials on page 110[*]	X	X	X
E-mail server information on page 111[*]	X	X	X
E-mail addresses	X	X	X
E-mail server authentication credentials	X	X	X
Web application server: managed server name and ports on page 113[*]	X	X	X
SAS Web Infrastructure Platform JDBC connection credentials on page 115[*]	X	X	X
Web application server administrator on page 116[* ***]	X	X	X
WebSphere application server node name, node agent name, and profile name on page 116[*]	X	X	X
Web application server dependencies	X	X	X
SAS Web Application Themes dependencies	X	X	X
SAS Web Report Studio scheduling user (Platform LSF only)	X	X	X
SAS Web Report Studio dependencies	X	X	X

Configuration Option in the SAS Deployment Wizard	Prompt Level That Displays the Option		
	Express	**Typical**	**Custom**
SAS BI Dashboard dependencies	X	X	X
SAS Information Delivery Portal JPS extension dependencies	X	X	X
SAS Help Viewer metadata configuration dependencies	X	X	X
SAS Web Infrastructure Platform dependencies	X	X	X
SAS Information Delivery Portal dependencies	X	X	X
SAS Web Infrastructure Platform dependencies	X	X	X
SAS BI Portlets dependencies	X	X	X
SAS Flex Application Themes dependencies	X	X	X
SAS Web Infrastructure Platform Extensions for BI Dashboard	X	X	X
Local machine name on page 107 *		X	X
Windows options: create shortcuts option		X	X
Windows shortcuts scope		X	X
Integrated Windows authentication (IWA) on page 108*		X	X
Anonymous Web access on page 110*		X	X
First user display name and account credentials		X	X
Object spawner port		X	X
Object spawner port bank ports		X	X
SAS Application Server: server context on page 111*		X	X
Workspace server port		X	X
Metadata utility workspace server port on page 111*		X	X
Pooled workspace server port on page 112*		X	X
Stored process server bridge port		X	X
Stored process server MultiBridge connection ports		X	X

Configuration Option in the SAS Deployment Wizard	Prompt Level That Displays the Option		
	Express	Typical	Custom
OLAP server port		X	X
SAS/SHARE server port		X	X
SAS/CONNECT spawner port		X	X
Framework Data Server port on page 112*		X	X
Framework Data Server transactional database files		X	X
SAS DATA step batch server deployed jobs information		X	X
Metadata utility SAS DATA step batch server deployed jobs information on page 112*		X	X
Operating System Services Scheduling Server port		X	X
Deployment Tester port and JUnit JAR file		X	X
Web application server automatic configuration on page 113*		X	X
SAS Remote Services application host name and port		X	X
Event broker HTTP port and admin port		X	X
Web application server automatic deployment on page 115*		X	X
SAS Web Application Themes host name, protocol, and port		X	X
IP multicast address, UDP port, TTL, authentication token option on page 117*†		X	X
SAS Web Report Studio enable clustering support		X	X
Enable SAS Web Report Studio scheduling on page 118*		X	X
SAS Web Report Studio in-process scheduling ports		X	X
BI Web Services: new Web services deployment method		X	X
SAS Content Server repository directory on page 118*		X	X
SAS Information Delivery Portal samples		X	X

Configuration Option in the SAS Deployment Wizard	Prompt Level That Displays the Option		
	Express	**Typical**	**Custom**
Database type for SAS Web Infrastructure Platform on page 114[*]		X	X
SAS Web Infrastructure Platform database properties on page 114[*]		X	X
SAS Web Infrastructure Platform database JDBC driver jars directory on page 115[*]		X	X
SAS Web Infrastructure Platform: Database Metadata on page 115[*]		X	X
WebLogic Web application server node manager host name and port		X	X
Web application server administration server name, port, and secured port (WebLogic and WebSphere only)		X	X
WebSphere application server deployment manager profile name, node name, and cell name		X	X
WebSphere application server deployment manager SOAP and RMI ports and timeouts		X	X
Web application server enable administrative security		X	X
WebSphere application server node SOAP port and RMI port		X	X
SAS WebParts for Microsoft SharePoint automatic deployment		X	X
SAS Flex Application Themes host name, port, and protocol		X	X
SAS BI Portlets Portal server		X	X
DataFlux Data Management Server on page 118[*]		X	X
DataFlux Data Management Server: Server Component Name on page 118[*]		X	X
Select products to configure[††]			X
Authentication domain on page 108[*]			X
Windows options: run as managed scripts or services on page 108[*]			X

	Prompt Level That Displays the Option		
Configuration Option in the SAS Deployment Wizard	**Express**	**Typical**	**Custom**
Metadata server: server librefs			X
Metadata server name and logical name on page 108[*]			X
Metadata server log filename and invocation options			X
Metadata server foundation repository			X
Metadata server Windows service information			X
SAS BI Web Services authentication method on page 109[*]			X
SAS Spawned Servers account: enable local security policy settings			X
SAS First User account: enable local security policy settings			X
SAS General Servers group			X
SAS Framework Data Server Admins group			X
SAS BI Web Services Users group			X
Common directories for logs, users, and temporary space on page 110[*]			X
Metadata server encryption level and algorithm on page 110[*]			X
Client-side connection profile credentials policy on page 111[*]			X
Object spawner name and host name			X
Object spawner object name in metadata			X
Object spawner invocation options and log filename			X
Object spawner Windows service information			X
SAS Application Server librefs			X
Workspace server name, logical name, and host name			X
Workspace server invocation options and log filename			X

Configuration Option in the SAS Deployment Wizard	Prompt Level That Displays the Option		
	Express	**Typical**	**Custom**
Metadata utility workspace server name, logical name, and host name on page 111[*]			X
Metadata utility workspace server invocation options and log filename			X
Pooled workspace server name, logical name, and host name on page 112[*]			X
Pooled workspace server invocation options and log filename			X
Stored process server name, logical name, and host name			X
Stored process server invocation options and log filename			X
OLAP server name, logical name, schema name, and host name			X
OLAP server invocation options and log filename			X
OLAP server Windows service information			X
SAS/SHARE server name and host name			X
SAS/SHARE server: server component name			X
SAS/SHARE server invocation options, server short name, and log filename			X
SAS/SHARE server Windows service information			X
SAS/CONNECT server name and logical server name			X
SAS/CONNECT server invocation options and log filename			X
SAS/CONNECT spawner name and host name			X
SAS/CONNECT spawner server component name			X
SAS/CONNECT spawner invocation options and log filename			X
SAS/CONNECT spawner Windows service information			X
Framework Data Server name and host name on page 112[*]			X

Configuration Option in the SAS Deployment Wizard	Prompt Level That Displays the Option		
	Express	Typical	Custom
Framework Data Server content directory, invocation options and log filename			X
Framework Data Server Windows service information			X
SAS DATA step batch server name, logical name, invocation options, and deployed jobs information			X
Metadata utility SAS DATA step batch server name, logical name, invocation options, and deployed jobs information on page 112[*]			X
Operating System Services name and host name			X
Operating System Services Scheduling Server additional SAS invocation options, object server parameter, and log filename			X
Deployment Tester host name			X
Query cache library directory and libref on page 112[*]			X
Output management library information on page 112[*]			X
Web application server administration server protocol and additional JVM options			X
WebSphere application server protocol for deployment manager - node agent protocol and ports			X
Secure JMS resources (WebLogic and JBoss only)			X
Web application server: proxy information on page 116[*]			X
WebSphere application server node additional JVM options on page 116[*]			X
Web application server: configure multiple managed servers on page 113[*]			X
WebLogic Web application server domain path and home directory			X
Web application server: managed server protocol and additional JVM options on page 113[*]			X
Web application server restrictive policy files (WebSphere and JBoss only)			X

	Prompt Level That Displays the Option		
Configuration Option in the SAS Deployment Wizard	**Express**	**Typical**	**Custom**
SAS Remote Services Windows service information			X
SAS Remote Services JVM settings on page 117*			X
SAS Web Report Studio upgrade reports			X
SAS Web Report Studio deployment instance name (WebLogic and WebSphere only)			X
SAS Web Report Studio description and context root			X
SAS BI Dashboard context root			X
SAS BI Web Services: completion code values, dynamic prompt validation, execution time-out, and anonymous execution			X
BI Web Services: new Web services base namespace, temp directory, and delete temp files			X
SAS Information Delivery Portal banner title and menu display options			X
SAS Information Delivery Portal unchallenged access on page 117*			X
SAS Information Delivery Portal and SAS Package Viewer context root			X
SAS BI Portlets editing and viewing interfaces			X
SAS BI Portlets and SAS JSR 168 Remote Portlets context roots			X
SAS Flex Application Themes host name, port, and protocol			X
SAS Web Parts for Microsoft SharePoint name, port, directory, and application pool			X
SAS Web Parts for Microsoft SharePoint URLs, installation directory, and user ID on page 118 *			X

* An asterisk (*) next to a configuration option indicates that more information is available later in this document. See the SAS Deployment Wizard online Help for information about all options.

** Option available for the server tier on Typical and Custom prompt levels only.

*** Option displays during express for WebLogic deployments only.

† Option displays during express and typical prompting when the configuration directory and level pre-exists.

†† Option displays during express and typical prompting whenever the middle tier is deployed.

Appendix 2
Troubleshooting Your Initial SAS 9.3 Deployment

Overview of Troubleshooting Your Initial SAS 9.3 Deployment

The SAS Deployment Wizard performs two major functions. Using inputs that you have provided, the wizard installs SAS, and then initially configures SAS. There are many components to a SAS Intelligence Platform deployment, but if one component happens not to deploy properly, it does not mean that you have to repeat the entire deployment. In most cases you can continue with the rest of the SAS deployment, and later troubleshoot the component that failed to deploy.

If you encounter a configuration error while running the SAS Deployment Wizard, follow these steps:

1. Read the configuration alert box and, leaving the alert box displayed, take any steps that it suggests.

2. After you have performed the steps, go back to the configuration alert box and click **Retry**.

3. If the configuration alert box re-appears and you are unable to resolve the issue, keep the deployment wizard as it is, and contact SAS Technical Support.

Figure A2.1 Configuration Troubleshooting Flowchart
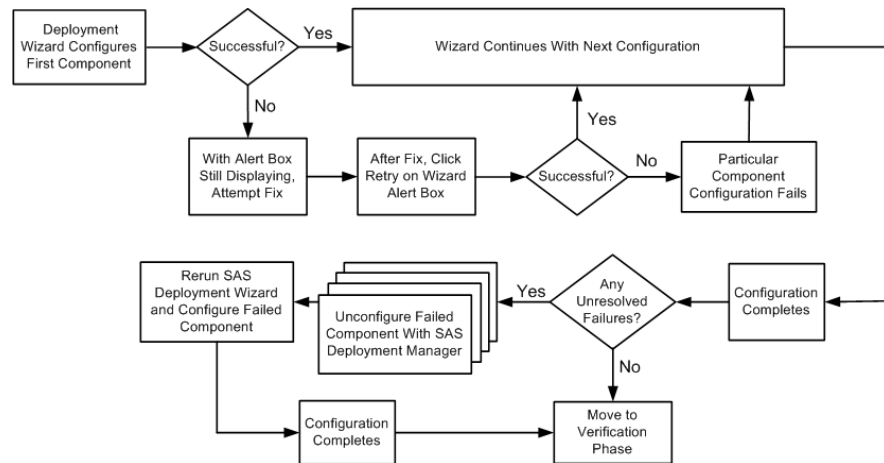
There can be situations when the configuration failed before the SAS Deployment Manager is properly configured. When this occurs, running the deployment manager is not an option. In these situations, you must do the following:

- Stop the metadata server (if it is running).

- Restore the most recent backup of the metadata repository and repository manager that you created before deploying.

- Restore the most recent backup of the Web application server directories.

- If any servers that failed to configure were installed as services on Windows, manually remove their service definitions.

  For more information, see your Microsoft Windows documentation.

- Manually delete the configuration directories for the SAS components that failed to configure.

The following topics are contained in this section:

Review SAS Deployment Tool Documents, Reports, and Logs

During configuration of SAS 9.3 the SAS automated deployment tools create various documents, reports, and logs that can help you identify any remaining configuration tasks and errors. Use the following documents to perform any manual configuration steps and correct any configuration errors:

- Instructions.html

  contains a list of SAS manual steps that must be performed to complete your deployment. **Instructions.html** resides under the SAS configuration directory in the **Lev*n*/Documents** subdirectory (for example: **C:\SAS \Config92\Lev1\Documents**).

- DeploymentSummary.html

  contains a list of the deployment tasks performed by the SAS Deployment Wizard and a brief status for each. The deployment summary is one source for a list of all the SAS products installed and configured in addition to information such as servers started, Web applications built, and Web applications deployed. `DeploymentSummary.html` resides under the SAS configuration directory in the `Levn/Documents` subdirectory (for example: `C:\SAS\Config \Lev1\Documents`).

- ConfigurationErrors.html

  contains a list of configuration errors that require further attention. `ConfigurationErrors.html` resides under the SAS configuration directory in the `Levn/Documents` subdirectory (for example: `C:\SAS\Config \Lev1\Documents`).

- UpdateInstructions.html

  contains a list of SAS manual steps that must be performed to complete adding maintenance to your deployment. `UpdateInstructions.html` resides under the SAS configuration directory in the `Levn/Documents` subdirectory (for example: `C:\SAS\Config92\Lev1\Documents`).

- Configuration logs (as needed)

  provide a finer list of errors for each SAS component that the SAS Deployment Wizard migrates and configures. There is one log file for each SAS component. The configuration logs reside under the SAS configuration directory in the `Levn/Logs/ Configure` subdirectory (for example: `C:\SAS\Config\Lev1\Logs \Configure`).

- SDW_*YYYY-MM-DD-HH-MM-SS*.log

  logs SAS Deployment Wizard messages, which can be used for general troubleshooting. The deployment wizard log is written to the following path:

  - Windows:

    `\Users\`*user*`\AppData\Local\SAS\SASDeploymentWizard`

  - Windows (Windows XP and earlier):

    `\Documents and Settings\`*user*`\Local Settings\Application Data\SAS\SASDeploymentWizard`

  - UNIX:

    home-directory`/.SASAppData/SASDeploymentWizard`

- SDM_*YYYY-MM-DD-HH-MM-SS*.log

  logs SAS Deployment Manager messages, which can be used for general troubleshooting. The deployment manager log is written to the following path:

  - Windows:

    `\Documents and Settings\`*user*`\Local Settings\Application Data\SAS\SASDeploymentWizard\9.3`

  - Windows (Vista only):

    `\Users\`*user*`\AppData\Local\SAS\SASDeploymentWizard`

  - UNIX:

    home-directory`/.SASAppData/SASDeploymentWizard`

Troubleshooting the SAS Server Tier

The following table lists some SAS server-tier errors and what to do to resolve them.

Table A2.1 *Troubleshooting the SAS Server Tier*

Error	Explanation	Resolution
When you attempt to run a SAS server for the first time, you receive an error message about the IOMServerAppender not finding a location for storing temporary utility files.	There is no temporary directory defined on the host machine's operating system.	Use the method appropriate for the server machine's operating system to define a temp directory. For more information, see "IOMServerAppender" in *SAS Logging: Configuration and Programming Reference*.
Pooled workspace server fails to start during the configuration of SAS Web Infrastructure Platform.	On Windows, the SAS installer might not have domain-qualified the SAS Spawned Servers user account (sassrv). This account is entered as a login in the SAS General Servers group, so it is required to have a domain prefix as are all Windows logins. Without domain qualifying the login, connections by this account become PUBLIC connections. By default, PUBLIC users cannot access the repository, which prevents the pooled workspace server from launching successfully. On UNIX, there might be a problem with the host name value returned by TCP.	On Windows, using SAS Management Console, edit the login associated with the SAS General Servers group and add a domain to it (for example: myhost\sassrv). You can edit logins in the **Plug-ins** tab of SAS Management Console (**User Manager** ⇨ **SAS General Servers** ⇨ **Accounts** ⇨ **Edit**). On UNIX, modify **/etc/hosts** or use the **-hostknownby** option. For more information, see "General Options" in Chapter 12 of *SAS Intelligence Platform: Application Server Administration Guide*.
You cannot validate the logical workspace server from SAS Management Console (SASApp) using the Server Manager plug-in.	By default, the unrestricted user is a SAS internal account. The workspace server needs an operating system user account and an identity in metadata to be able to authenticate itself to the machine on which it runs.	Re-try the validation from SAS Management Console. You should be prompted for user account credentials. Enter credentials for a user account that the workspace server can authenticate and that has (on Windows) the **Log in as a batch job** user rights. One account that meets these requirements is the SAS Spawned Servers account (sassrv).

Error	Explanation	Resolution
After you have updated the user's credentials to allow access, you are denied access when trying to connect to or validate a server or spawner.	The credentials cache must be cleared before you try to connect or validate again.	To clear the credentials cache, in SAS Management Console, click **File** ⇨ **Clear Credentials Cache**. If the object spawner denies access to a server because of the lack of ReadMetadata permissions, and the user is then granted the needed permission, you must reset the object spawner's authorization cache before the user tries to connect again. To do so, expand the Server Manager tree in SAS Management Console. Next, expand the object spawner, right-click the host node, and choose **Connect** in the pop-up menu. After you have connected, right-click the host node again, and choose **Refresh Spawner** in the pop-up menu.
Unable to start a pooled workspace server *and* unable to start a stored process server.	Most likely, something is wrong with the object spawner. The metadata server might not be able to authenticate the object spawner.	Make sure that the object spawner is running. For more information, see Chapter 5, "Operating Your Servers," in *SAS Intelligence Platform: System Administration Guide*. If you cannot start the object spawner, make sure that the metadata server is running. Check the log for the object spawner and determine whether the spawner is able to find the server's definition. For more information, see "Using SAS Management Console to Monitor SAS Servers" in Chapter 8 of *SAS Intelligence Platform: System Administration Guide*. Also check the event log on Windows or the syslog on UNIX or z/OS. You can correct the credentials used to authenticate the spawner in the *SAS-configuration-directory***/ObjectSpawner/metadataConfig.xml** file, or reconfigure the spawner using the SAS deployment tools. For more information, see "Overview of Managing Your SAS Deployment" on page 161. Make sure that no one has assigned user admin capabilities to the SAS Trusted User account (sastrust@saspw, by default). On UNIX, check the Object Spawner log just after it starts for an entry similar to: `Objspawn is executing on host machine.name.domain.com (10.101.0.98)`. If you see something similar to: `Objspawn is executing on host localhost (127.0.0.1)` or, if you see a host name that you cannot ping from a remote machine, you might need to replace the **-dnsMatch** option with the **-hostknownby** option. Refer to the following SAS Note: **http://support.sas.com/kb/42/905.html**.
You cannot start your SAS server.	The file sas.servers might not be automatically generated. This does not imply any issue with your configuration and does not indicate something is wrong.	Generate the sas.servers file manually by running *SAS-configuration-directory***/data/SAS/BIServer/Lev***n***/generate_boot_scripts.sh**. For more information, see "Using the sas.servers Script on UNIX or z/OS to Start or Stop All Servers" in Chapter 5 of *SAS Intelligence Platform: System Administration Guide*.

Error	Explanation	Resolution
You see an error message about the location of the JUnit JAR file not being specified for SAS Deployment Tester.	The SAS Deployment Tester tests other products that use JUnit for validation. Without JUnit, these products might operate properly, but you will not be able to validate them using the SAS Deployment Tester.	On Windows, The JUnit JAR is available from the Third-Party Software Downloads site at: `http://support.sas.com/resources/thirdpartysupport/v93/othersw.html#tab_junit`. Place the JUnit JAR in this location: `C:\junit3.8.1\junit.jar`. On UNIX, modify `provider.config` in *SAS-configuration-directory*`/Lev1/DeploymentTesterServer/Config` and update the `ReadOnlyVar._junitJar` parameter (for example, `ReadOnlyVar._junitJar=/apps/sas/third_party/junit/junit4.8.1/junit-4.8.1.jar`).
A Deployment Tester error message in the Windows Event Viewer reads: `System error 1067`	The Deployment Tester cannot start because it is configured to run as a Windows Local Service instead of a Local System account.	The workaround is to use the Windows Services snap-in to change the Deployment Tester Service logon from LocalService to LocalSystem. For more information, see `http://tsdsrv05.unx.sas.com:7777/iw/docs/sasnotes/fusion/35/418.html`.

Troubleshooting SAS Web Applications

The following table lists some SAS Web application errors and what to do to resolve them.

Table A2.2   *Troubleshooting the SAS Web Applications*

Error	Explanation	Resolution
SAS Web Report Studio or the SAS Information Delivery Portal displays a "Cannot find server" error.	Either your servlet container or Web application server is not running. There is problem with the URL that you are using to start the application.	Make sure that your servlet container or Web application server is running. If it is not running, start it. This will probably solve the problem. If the server is already running, the problem could be with the URL that you are using to start the Web application. Use the correct URL: **http://***host-name***:***port-number***/***application-name*. Make sure that the host name is the fully qualified name of the host on which your servlet container or Web application server is running. Make sure that the port number identifies the port on which the server is listening. For the JBoss Application Server, this will normally be port 8080. Finally, make sure that the application name in the URL matches the actual name of the Web application (including case).
Each time your Web application requests a new page, there is a long delay.	When a Java Server Page (JSP) is requested for the first time, you can expect a significant delay. When all of your JSPs have been converted to compiled servlets, the problem will be resolved.	Tune your servlet container or Web application server. For example, if you are using the WebLogic Server, the server might be checking (on a per application basis) for updated JSPs and updated compiled servlets. You can suppress these checks by setting an application's JSPPageCheck and ServletReloadCheck properties to -1. See your server vendor's documentation for similar tips.
The SAS Information Delivery Portal displays a "Could not authenticate user" error.	The user is not registered in the metadata repository. On Windows, if the user that is trying to log on is registered in the metadata, but the user name is not domain qualified, the user will not be able to log on.	In SAS Management Console, add a login to the Person object that contains at least a user name. On Windows, make sure the user name has the form *host\user-ID* or *domain\user-ID*. For more information, see "About User Administration" in Chapter 2 of *SAS Intelligence Platform: Security Administration Guide*.
SAS stored processes run from the SAS Add-In for Microsoft Office, but do not run from the SAS Information Delivery Portal.	The SAS Services Application might not be running.	Start the following in this order: WebDAV Server, SAS Services Application, and your servlet container or Web application server. For more information, see Chapter 5, "Operating Your Servers," in *SAS Intelligence Platform: System Administration Guide*.

Error	Explanation	Resolution
You are unable to start the SAS Services Application.	Another application might be using the same port as the SAS Services Application (by default, 5091).	Configure the SAS Services Application to listen on a different port.
You receive a server error when accessing the Help menu from a SAS Web application.	SAS Help Viewer Metadata Configuration is not configured.	Rerun the SAS Deployment Wizard to install and configure SAS Help Viewer Metadata Configuration. For more information, see "Install and Configure SAS Interactively" on page 98.
An error page appears when you access the Help menu from a SAS application or the Help menu item for a SAS application does not display.	The online Help for the SAS application was not installed or the SAS Help Viewer Metadata Configuration Web application was not rebuilt after the online Help was installed.	Verify that the online Help was installed. If not, install it using the SAS Deployment Wizard. Once the Help is installed, rebuild the SAS Help Viewer Metadata Configuration Web application using the SAS Deployment Manager and redeploy the SAS Help Viewer Metadata Configuration EAR. For more information, see "Install and Configure SAS Interactively" on page 98 and Appendix 7, "Rebuilding the SAS Web Applications," in *SAS Intelligence Platform: Middle-Tier Administration Guide*.
The SAS Deployment Wizard displays a message similar to the following: `Configuration Update Failure The update was not successful for one or more products in the following configuration directory: /myconfig/Lev1 Would you like to retry the update for this configuration directory?`	The deployment wizard is running in update mode, and after the installations are updated, the wizard iterates over all the configuration directories to run the deployment manager to update each one. If you encounter an error or if you cancel an update before it completes, the deployment wizard displays this failure message.	Stop the SAS Application Servers (for example, the object spawner) and the Web application servers (JBoss) before clicking **Retry**. Clicking **Retry** reconfigures all products, not just the one that failed. (Metadata does not need to be restored to a pre-configuration backup to succeed.)

Managing Your SAS Deployment

Overview of Managing Your SAS Deployment

The sections that follow discuss how to use the SAS 9.3 deployment tools to add, update, or configure a SAS product, remove a SAS product configuration, and renew your software license for certain SAS solutions.

For information about removing a SAS installation, see "Overview of Uninstalling the SAS Intelligence Platform" on page 209.

The following topics are contained in this section:

Adding, Updating, and Upgrading SAS Software

Overview of Adding, Updating, and Upgrading SAS Software

The following topics are contained in this section:

What Is Adding, Updating, and Upgrading?

This document uses the terms "adding," "updating," and "upgrading" in the following ways.

- "Adding" refers to installing and configuring a SAS product that is new to your system. Here are some common scenarios:
  - You ordered the SAS product but did not install it.
  - You are deploying new products from a new SAS order.

- "Updating" refers to installing and configuring a SAS product with a maintenance release. Information related to updates resides mainly in *SAS 9.3 Guide to Software Updates*.

- "Upgrading" refers to installing and configuring new versions of SAS products that are already deployed on your system (for example, upgrading to SAS Web Report Studio 4.3 from version 4.2). Upgrading should not be confused with migration or promotion.

For more information, see *SAS 9.3 Guide to Software Updates*.

Summary of Adding, Updating, and Upgrading SAS Software

When you are adding, updating, or upgrading your SAS 9.3 deployment, the SAS Deployment Wizard is able to determine whether the order from which you are running the wizard contains SAS software with a newer, older, or identical release level than what is already deployed in the SAS installation directory (commonly referred to as SAS Home).

If the wizard determines that there is newer SAS software in the current order than what is already deployed, then the wizard automatically goes into *Update mode*. Update mode forces you to install updates to your software before you can perform any other deployment task. For example, if you are adding new products or language support to an existing SAS deployment, you will install those in an additional SAS Deployment Wizard session, after the wizard (in Update mode) has first updated the products on your machine to match the versions contained in your SAS order.

CAUTION:
Consult *SAS 9.3 Guide to Software Updates* before performing *any* SAS updates.

For more information, see the following:

How the SAS Deployment Wizard Adds, Updates, and Upgrades Software

This topic describes in greater detail how the SAS Deployment Wizard adds, updates, and upgrades SAS software.

The wizard compares the release version of the SAS software in the current order to the SAS software that is deployed on the machine. Three possibilities exist:

- The software in the order has a *newer* release level than the software deployed on the machine.
- The software in the order has an *older* release level than the software deployed on the machine.
- The software in the order has an *identical* release level as the software deployed on the machine.

Upgrades and updates consist of a new version or an incremental delta update (also referred to as maintenance) to an installed product. If the deployment wizard detects that one or more products in the order have a *newer* release level than any products deployed in the specified SAS Home on the machine, the wizard goes into Update mode. (SAS Home is shorthand for the SAS installation directory (for example, `C:\Program Files\SAS`). The wizard displays an updates page of all the products deployed on the machine for which there are updates in the current order.
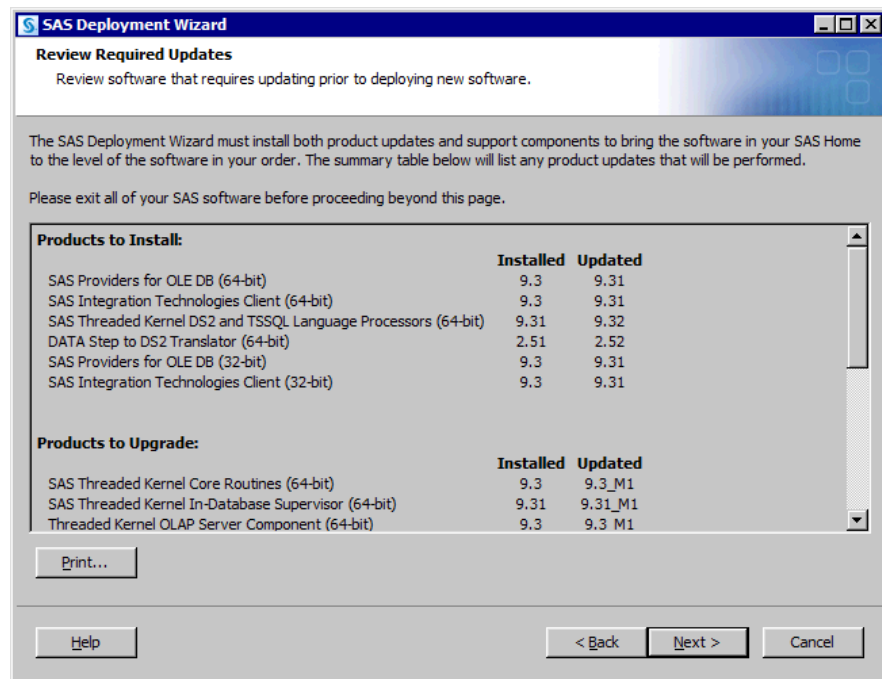
The deployment wizard updates page is broken into two sections that list new product versions and new product delta updates (or maintenance). In the example of the updates page shown earlier, SAS Providers for OLE DB (64–bit) represents a new product version (for example, 9.3 to 9.31). SAS Threaded Kernel Core Routines (64–bit) represents a delta update (for example, 9.3 to 9.31_M1). If you choose to proceed with your deployment from this order, to the specified SAS Home, the wizard requires that you install these updates to bring your existing deployment to the release level from which your new order was mastered. When you click **Next**, the wizard automatically upgrades the products to the release levels that are shown on the updates page.

CAUTION:
   Consult *SAS 9.3 Guide to Software Updates* before performing *any* SAS updates.

When running in Update mode, the wizard displays no deployment plan, SAS installation data file, or language pages down this path. The wizard simply installs the newest versions and delta updates of the product set already deployed in the specified SAS Home. If the update contains updated language support for a specific product (such as, SAS, SAS Enterprise Guide, and SAS Add-In for Microsoft Office), the wizard installs only the update for the languages previously installed. If you are adding new products or language support to an existing SAS deployment, you will install those in an additional SAS Deployment Wizard session, after the update is installed and any customization or validation is performed.

If the deployment wizard detects that one or more products in the software order has an *older* release level than any products deployed in the specified SAS Home on the machine, the wizard does *not* go into Update mode. Instead, the wizard presents you with an alert box listing those products in your order that are older than the ones deployed on your machine.

Warning ✕

⚠ The SAS Deployment Wizard has detected that your SAS Home location contains the following software, which is newer than what is included in the order you are attempting to deploy. Software being deployed to an existing SAS Home must be as current as or newer than the products in that SAS Home.

SAS Client Connection Profile Configuration 5.1
SAS Enterprise Guide Server Data 5.1

[OK]

SAS wants to make sure that you are always installing software from an order corresponding to a release level that is identical to or newer than the one used to originally deploy your SAS software. Your options are to use a different software order, designate a different SAS Home directory, or uninstall the products that are newer.

If the deployment wizard detects that all the products in the order have an *identical* release level to all products deployed in the specified SAS Home on the machine, the wizard does *not* go into Update mode. Instead, the wizard presents pages that enable you to perform normal deployment tasks such as deploying products, installing additional software, and so on.

The following diagram summarizes how the SAS Deployment Wizard manages deploying products, installing additional software, and applying updates:

Figure A3.1   *SAS Deployment Wizard Flowchart*
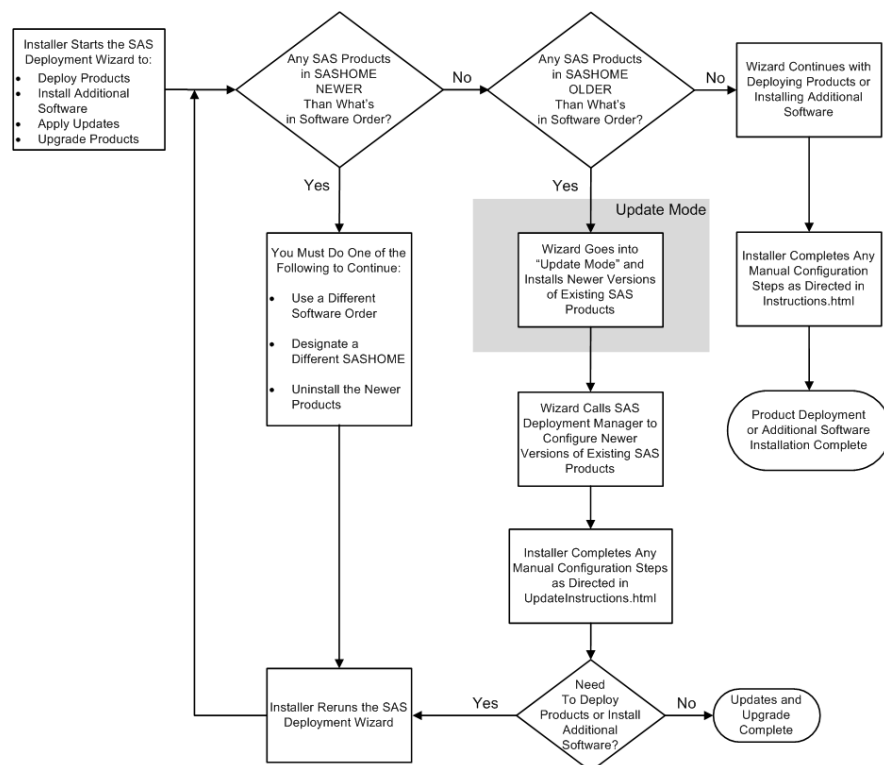
Remove Update Backup Files

Whenever the SAS Deployment Wizard upgrades or updates software on a machine, it creates a backup copy of the software being updated. After you apply the updates, you

can use the SAS Update File Cleanup Utility to remove the backup copies to reclaim disk space. To remove update backup files, follow these steps:

CAUTION:

Consult *SAS 9.3 Guide to Software Updates* before performing *any* SAS updates.

1. Log on as the SAS Installer user to the machine on which the SAS updates were applied.

2. From an operating system prompt, change to the *SAS-install-directory***/ InstallMisc/MIT** subdirectory.

   For example, issue one of the following commands:

   - UNIX:

     cd **/opt/sas_93/InstallMisc/MIT**

   - Windows:

     cd **\Program Files\SAS\InstallMisc\MIT**

   - z/OS:

     cd **/usr/lpp/SAS/SAS_93/InstallMisc/MIT**

3. Enter the following command appropriate for your operating system:

   - UNIX and z/OS:

     ./cleanup.sh

   - Windows:

     cleanup.bat

   The SAS Update File Cleanup Utility window appears.
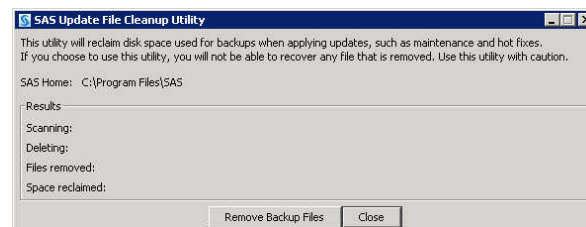
4. Click **Remove Backup Files**.

   The utility sweeps through the SAS Home directory structure and deletes backup files.
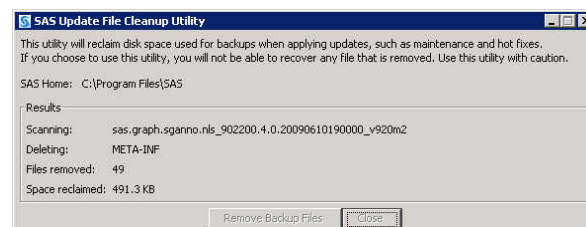
   When the deletion process is complete, the Complete alert box displays.
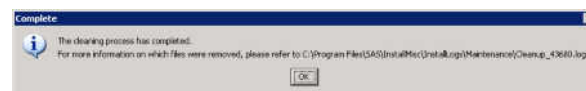
5. Click **OK**.

The cleanup utility logs which files and directories that it removes in the following location: *SAS-install-directory*
/InstallMisc/InstallLogs/Maintenance/Cleanup_*nnnnn*.log.

Specify a Different JRE

During a first-time SAS 9.3 deployment, the SAS Deployment Wizard prompts you for the version of the Java Runtime Environment (JRE) that you want to use with the SAS Java applications. Your options are to have the deployment wizard install a JRE that SAS has certified to run with SAS 9.3, or to point to a JRE that you have already installed.
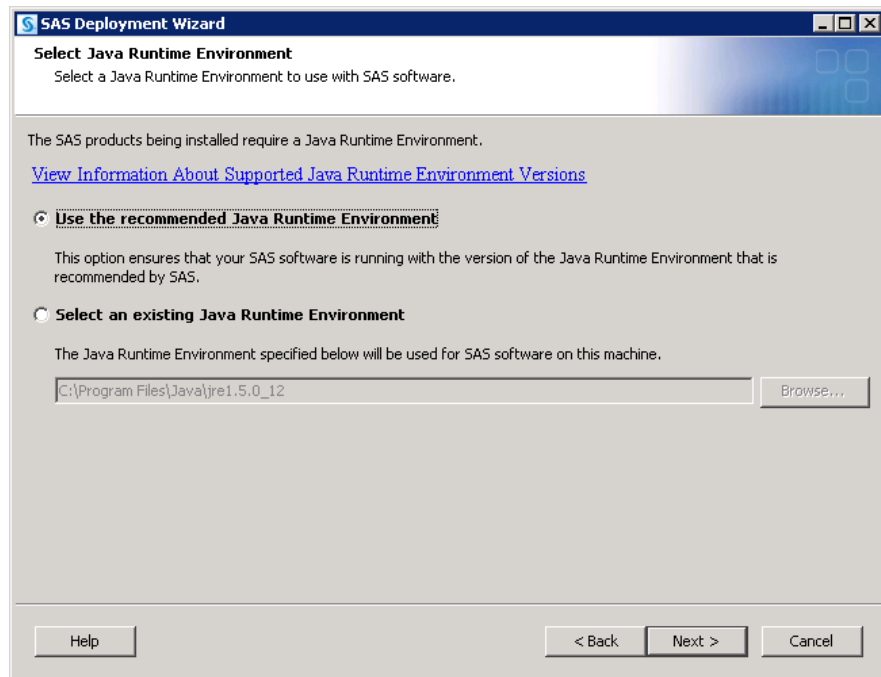
In most situations where you are updating or adding a product to SAS 9.3, the deployment wizard does *not* prompt you for a JRE. However, you can override this behavior. To specify a different JRE with which to run SAS Java applications, follow these steps:

1. Log on to the machine on which you run SAS Java applications using the SAS Installer user.

   For more information, see "Required External User Accounts for SAS" on page 8.

2. Run the deployment wizard using its command line invocation and add the option **-forcejreprompt** (for example, **setup.exe -forcejreprompt**).

   For more information, see Step 9 on page 99 in the topic, "Install and Configure SAS Interactively."

3. During your deployment wizard session, you should see the Select Java Runtime Environment page that prompts you for a JRE path.

4. After the deployment wizard has finished executing, change to the SAS installation directory (SAS Home) (for example, **C:\Program Files\SAS**).

5. Open sassw.config in a text editor and update the JREHOME property with the path to the new JRE that you want to use.

   For example:

   ```
   JREHOME=C:\Program Files\Java\jre6\bin\java.exe
   ```

6. There are additional steps that should be performed when changing the JRE to ensure that all affected areas are updated appropriately. Fore more information, see the "Configuring SAS 9.3 to Use an Alternative Java Runtime Environment or Java Development Kit " Web page at: **http://support.sas.com/resources/ thirdpartysupport/v93/AlternateJRE.html**.

Adding SAS Products

Overview of Adding SAS Products

The following topics are contained in this section:

- "About SAS Software Orders and SAS Software Depots" on page 169
- "Add SAS Products That Do Not Require Configuration" on page 169
- "Add SAS Products That Require Configuration" on page 174

The SAS Deployment Wizard enables you to change your SAS 9.3 deployment. Here are some of the most common scenarios:

1. configuring new products from your initial SAS 9.3 order.

   For one reason or another, you ordered the software and did not install it. Or you installed the software, but chose not to configure it.

2. deploying additional products from a new SAS 9.3 order.

   The additional products are not a part of your original SAS 9.3 order. So you made another order and now have to download and deploy the new order.

3. re-installing and reconfiguring (redeploying) a SAS product.

   You want to move the SAS product to a new machine.

4. applying updates (maintenance) to a SAS product that requires also updating its configuration.

   For some reason, you were unable to finish applying the updates and you need to rerun the SAS Deployment Manager to complete the updates to your configuration.

Most SAS products require that you install and configure them in a two-step process: You shut down the SAS server and middle tiers and run the SAS Deployment Wizard to install the new products. Then, you restart the SAS server and middle tiers and rerun the deployment wizard to configure the newly installed products.

A few products, such as SAS Drivers for ODBC, do not require the configuration step. You simply shut down the SAS server and middle tiers, install the new products, and then restart what you shut down.

About SAS Software Orders and SAS Software Depots

A *SAS Software Depot* is a file system that consists of a collection of SAS installation files that represents one or more orders. The 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 depot contains the SAS Deployment Wizard executable, one or more deployment plans, SAS installation data files, order data, and product data.

A SAS Software Depot is designed to contain your initial SAS 9.3 software order and additional orders that you make in the future. When you download your additional order to your pre-existing software depot, you download only those products that you do not already have. If you are downloading an additional order and creating a new software depot, then your download time could be longer.

When you add a new SAS software order to your pre-existing SAS Software Depot, you run the SAS Download Manager and specify the location of the original depot. For more information, see "Create a Depot By Using the SAS Download Manager" on page 31.

If you decide that you want to create a new SAS Software Depot for your new software order, you also run the SAS Download Manager. However, first make sure that you have fulfilled the necessary requirements described in "Prerequisites for Creating a SAS Software Depot" on page 30.

Add SAS Products That Do Not Require Configuration

Some SAS products such as SAS/ACCESS Interface to Oracle do not require the SAS Deployment Wizard to configure them. If the products that you are adding to your SAS deployment do not require configuration, follow these steps:

1. Verify that you have installed all the necessary third-party software outlined in "About Installing Third-Party Products" on page 62.

   Note: During the SAS installation, the SAS Deployment Wizard prompts you for paths to the requested third-party software. You must have the necessary third-party software installed on the current machine, or the SAS Deployment Wizard will *not* let you continue with the installation. In this situation, you will have to end the SAS Deployment Wizard session and install the required third-party software before you can continue.

2. Make sure that your SAS Software Depot is accessible to all the machines on which you are installing SAS. If this is not possible, then you will have to copy the entire depot to a location that the target machine can access.

   For information about copying your depot to a location that is not on your network, see "Create a Disc Image of Your Order" on page 54.

3. If you are installing a SAS 9.3 product that is not a part of your original order, make sure that you have downloaded the additional order.

   For more information, see "About SAS Software Orders and SAS Software Depots" on page 169.

4. Shut down your SAS server and middle-tier servers.

   For more information, see Chapter 5, "Operating Your Servers," in *SAS Intelligence Platform: System Administration Guide*.

5. Log on to the machine as the SAS Installer user.

This is the user with which your SAS deployment was installed. For more information, see "Required External User Accounts for SAS" on page 8.

6. Start the SAS Deployment Wizard from the highest-level directory in your SAS Software Depot using the command appropriate for your operating system.

   Note: If you want to use a different Java Runtime Environment, you must invoke the deployment wizard with a special start up option, `-forcejreprompt`. For more information, see "Specify a Different JRE" on page 167.

Table A3.1   Start Up Commands for the SAS Deployment Wizard

Operating System	Command
Windows	`setup.exe -record -deploy`
UNIX	`setup.sh -record -deploy`
z/OS	`setup.rexx -record -deploy`
	To use a temporary directory other than `/tmp`, specify `-templocation` *new-temp-dir*.

For more information, see "Creating SAS Software Depots" on page 30.

You should see a welcome page similar to the following:

7. Select the language that you want the SAS Deployment Wizard to use when it displays text.

8. Select **Install SAS Software**.

9. If you have more than one SAS software order in your depot, the wizard prompts you to select the order that you want to install.

10. If the wizard detects that there are SAS software products in your order that are more recent than what you have deployed on your machine, then the wizard automatically goes into Update mode. For more information, see "Summary of Adding, Updating, and Upgrading SAS Software" on page 163.

    If you need to install product updates, then follow these steps:

    a. Install the updates using the SAS Deployment Wizard.

       CAUTION:

Consult *SAS 9.3 Guide to Software Updates* before performing *any* SAS updates.

b. When you are finished performing any required manual configuration steps, rerun the SAS Deployment Wizard.

11. On the Select Deployment Type page, choose one of the following options:

- **Install SAS Foundation and Related Software**

  This option provides a quick installation of *all* SAS Foundation and related software (such as SAS Enterprise Guide) without using a plan file. If you want to install one piece of SAS Foundation only, such as SAS/ACCESS Interface to Oracle, do *not* choose this option.

- **Install Additional Software**

  This option provides a list of available software from which you select what to install. Software installed using this option can be configured only manually.

  Note: If the product that you are adding is a SAS Foundation product, then select **Install Additional Software**. The subsequent page lists the SAS Foundation products from which you choose the product that you want to add.
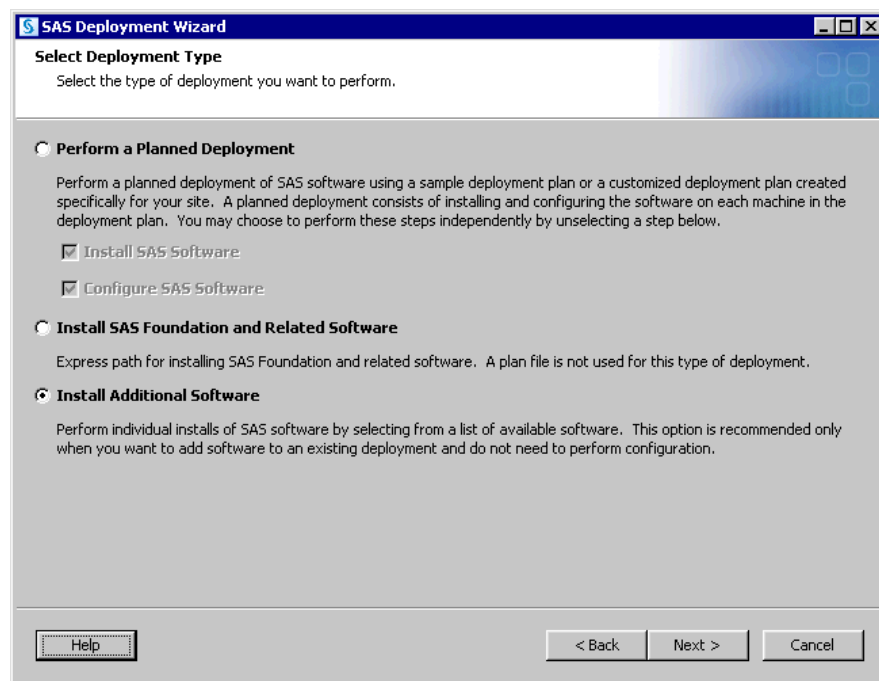
12. (UNIX and z/OS only) Specify the location (SAS Home) where you want to install SAS.

13. In the Select Products to Install page, select the products that you want to install.

Remember, that the deployment wizard will not configure any of your selections. The wizard only installs the software.
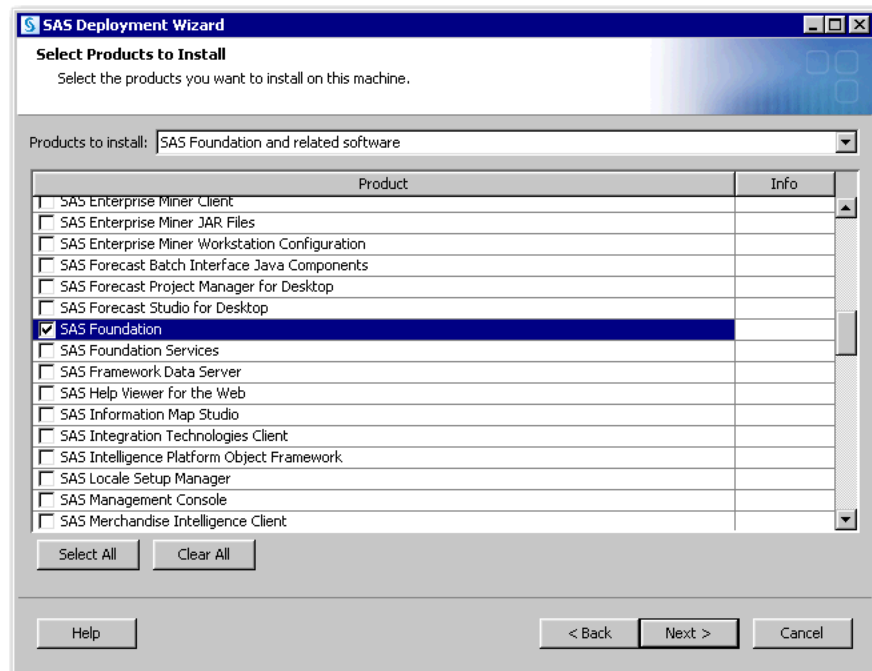
14. Some products listed on the Select Products to Install page include multiple sub-products, such as **SAS Foundation**, which you see on the next page. In these situations, select additional products, such as **SAS/ACCESS Interface to Oracle**, and click **Next**.
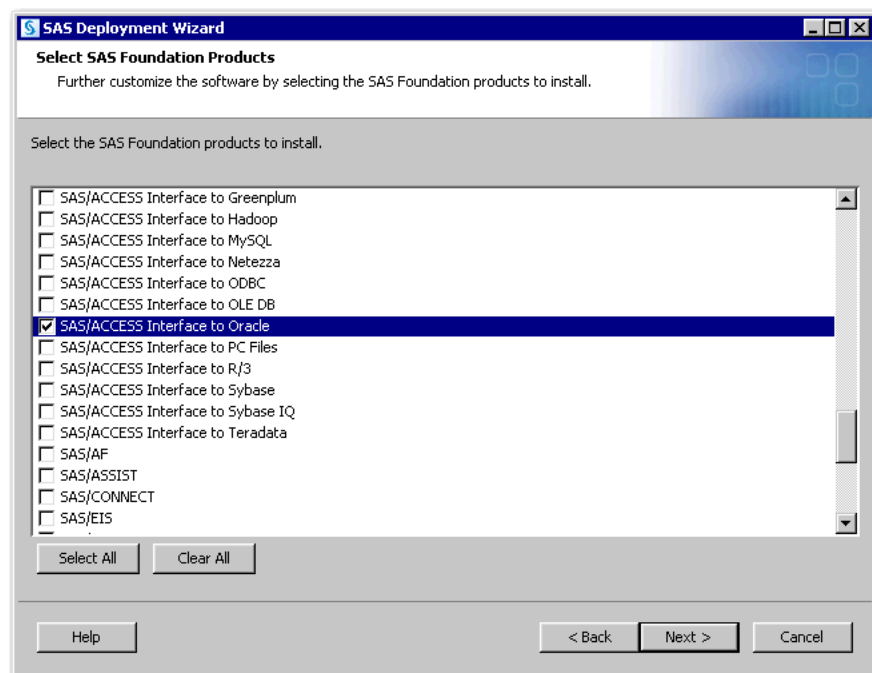
15. Specify the location of the SAS installation data file that contains information about the software that you have licensed for the current machine.

CAUTION:
   Be careful to use the correct installation data file that contains the SAS products that you are planning to install. Using an incorrect file can cause installation failure for SAS add-on products or other errors later when attempting to run SAS.

16. When you see the Deployment Summary page, the deployment wizard has finished collecting installation input. This is the last opportunity to go back and change any information that you have provided in previous pages before the wizard begins writing to your system.

    Make one of the following choices:

    • Select **Start** to begin installing SAS files to the current machine.

    • Select **Back** to navigate to earlier wizard pages to change installation information previously entered.

    • Select **Cancel** to terminate the wizard session. Note that you will lose installation information previously entered.
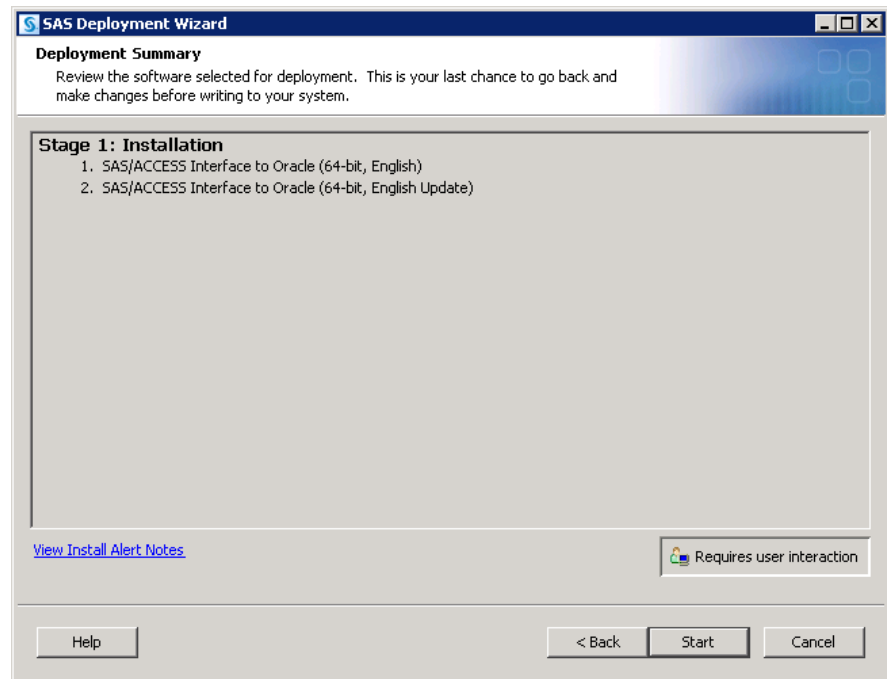
17. Provide the remaining information as the wizard prompts you for it. For more information, see "Install and Configure SAS Interactively" on page 98.

    When you see a page similar to the following, the SAS Deployment Wizard is finished:
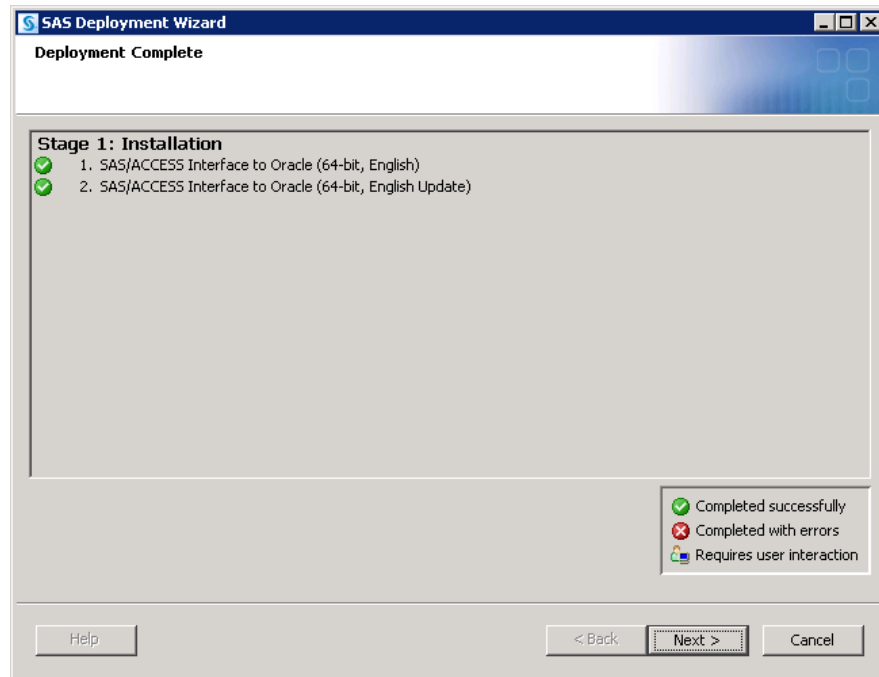
18. Click **Next** to go to the Additional Resources page.

19. Click **Finish** to close the deployment wizard.

20. Restart your SAS server and middle tiers.

    For more information, see Chapter 5, "Operating Your Servers," in *SAS Intelligence Platform: System Administration Guide*.

21. To verify that your SAS product was actually installed, please run a registry report. For more information, see **http://support.sas.com/kb/35/968.html**.

Add SAS Products That Require Configuration

Most SAS products that you add to your deployment require that you install and configure them in a two-step process: you shut down the SAS server and middle tiers and run the SAS Deployment Wizard to install the new products. Then, you restart the SAS server and middle tiers and rerun the deployment wizard to configure the newly installed products. If the products that you are adding to your SAS deployment require configuration, follow these steps:

1. Verify that you have installed all the necessary third-party software outlined in "About Installing Third-Party Products" on page 62.

   Note: During the SAS installation, the SAS Deployment Wizard prompts you for paths to the requested third-party software. You must have the necessary third-party software installed on the current machine, or the SAS Deployment Wizard will *not* let you continue with the installation. In this situation, you will have to end the SAS Deployment Wizard session and install the required third-party software before you can continue.

2. Make sure that your SAS Software Depot is accessible to all the machines on which you are installing SAS. If this is not possible, then you will have to copy the entire depot to a location that the target machine can access.

   For information about copying your depot to a location that is not on your network, see "Create a Disc Image of Your Order" on page 54.

3. If you are installing a SAS 9.3 product that is not a part of your original order, make sure that you have downloaded the additional order.

   For more information, see "About SAS Software Orders and SAS Software Depots" on page 169.

4. Make sure that you use a deployment plan that contains any add-on products as well as all original products for each machine that you are configuring.

   Table A3.2 *Where is My Deployment Plan?*

SAS 9.3 Products Being Added	Location of My Deployment Plan
Are part of my original SAS 9.3 order	In the `plan_files` directory in the original SAS Software Depot
Are on a machine where a SAS 9.3 server, middle tier, or data tier already resides	In the SAS configuration directory in the `Utilities` directory
Are part of my new SAS 9.3 order	In the `plan_files` directory in the SAS Software Depot

5. Shut down your SAS server and middle tier servers.

   For more information, see Chapter 5, "Operating Your Servers," in *SAS Intelligence Platform: System Administration Guide*.

6. If you have a multiple-machine SAS deployment, it is important to run the SAS Deployment Wizard using your new deployment plan on every machine, following this order:

   a. Metadata server

   b. SAS servers

   c. SAS data servers

   d. SAS middle-tier servers

   e. SAS clients

   If the SAS software requires updates, the deployment wizard will go into Update mode. When you have finished updating, rerun the wizard to install any additional SAS software that the new add-on product might require. Do this on each machine following the sequence earlier specified.

7. Log on to the machine as the SAS Installer user.

   This is the user with which your SAS deployment was installed. For more information, see "Required External User Accounts for SAS" on page 8.

8. Start the SAS Deployment Wizard from the highest-level directory in your SAS Software Depot using the command appropriate for your operating system:

   Note: If you want to use a different Java Runtime Environment, you must invoke the deployment wizard with a special start up option, `-forcejreprompt`. For more information, see "Specify a Different JRE" on page 167.

Table A3.3   *Start Up Commands for the SAS Deployment Wizard*

Operating System	Command
Windows	`setup.exe -record -deploy`
UNIX	`setup.sh -record -deploy`
z/OS	`setup.rexx -record -deploy` To use a temporary directory other than **/tmp**, specify **-templocation** *new-temp-dir*.

For more information, see "Creating SAS Software Depots" on page 30.

You should see a welcome page similar to the following:

9. Select the language that you want the SAS Deployment Wizard to use when it displays text.

10. Select **Install SAS Software**.

11. If you have more than one SAS software order in your depot, the wizard prompts you to select the order that you want to install.

12. If the wizard detects that there are SAS software products in your order that are more recent than what you have deployed on your machine, then the wizard automatically goes into Update mode.

    For more information, see "Adding, Updating, and Upgrading SAS Software" on page 162.

    If you need to install product updates, then follow these steps:

    a. Install the updates using the SAS Deployment Wizard.

       CAUTION:
       Consult *SAS 9.3 Guide to Software Updates* before performing *any* SAS updates.

    b. When you are finished performing any required manual configuration steps, rerun the SAS Deployment Wizard.

13. On the Select Deployment Type page, choose **Perform a Planned Deployment** and **Install SAS Software**.

Note: Make sure that **Configure SAS Software** is deselected.
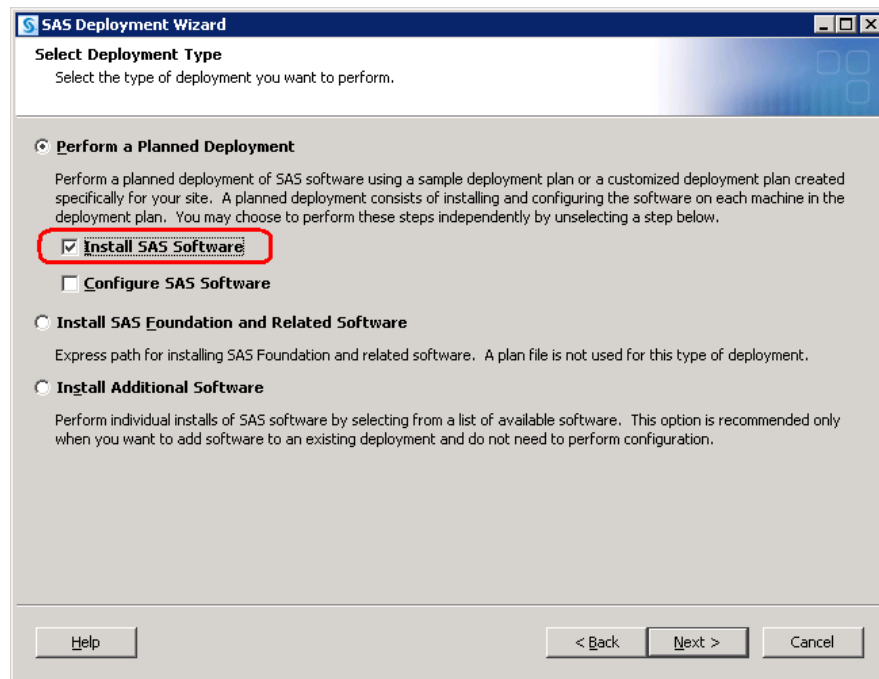
14. (UNIX and z/OS only) Specify the location (SAS Home) where you want to install SAS.

15. Specify the type of deployment plan that you are using.

- customized deployment plan

  Choose **Specify the full path to a customized deployment plan**, and then click **Browse** to navigate to the plan file.

- standard deployment plan

  Choose **Select a standard deployment plan**, and then choose the appropriate deployment plan in the drop-down list.
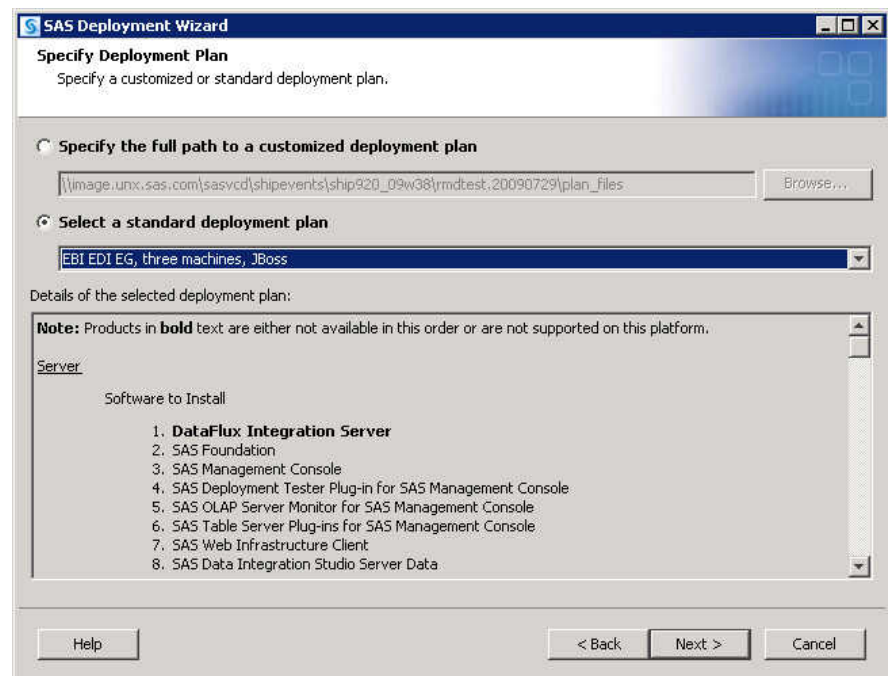
16. Select the machine on which you are installing, and select the SAS products that you want to install, by doing the following:

    a. Select the machine on which you are installing software from the **Machine** drop-down list.

       Note: If you are deploying SAS on multiple machines, make sure that you are following the process described in "Installation Order Rules for Multiple Machine Deployments" on page 81 .

    b. By default, all products displayed will be installed. Leave all products selected. If there are no product changes, then the deployment wizard will not re-install any pre-existing products.

17. If you are installing SAS on a Windows 64-bit operating system, you will see a wizard page that asks you which mode you want to install SAS Foundation in (32-bit or 64-bit mode). The advantage to installing SAS in 64-bit mode is that you can access memory beyond the four GB limit imposed by the 32-bit Windows operating system. For more information, consult the deployment wizard online Help.

18. Specify the location of the SAS installation data file that contains information about the software that you have licensed for the current machine.

    CAUTION:
    Be careful to use the correct installation data file that contains the SAS products that you are planning to install. Using an incorrect file can cause installation failure for SAS add-on products or other errors later when attempting to run SAS.

19. (z/OS only) Provide input for the following prompts:

    Note: For more information, see the *Configuration Guide for SAS 9.3 Foundation for z/OS*, available at: `http://support.sas.com/documentation/installcenter/en/ikfdtnmvscg/64313/PDF/default/config.pdf`.

    • **FTP Batch Generation**

      Specify the fully qualified host name or IP address of the z/OS mainframe machine on which you are deploying SAS. Also supply a valid user ID and password with which the SAS Deployment Wizard will FTP deployment information to the mainframe machine.

    • **Specify Jobcard Information**

      Specify the job account, programmer name, message class, message level, time, and region values. For more information, consult your z/OS documentation.

    • **Select Installation Action**

      Choose **B - Add products to existing SAS libraries**.

    • **Specify New Installation Qualifier**

      Specify the path where you want to install SAS. You can also choose to require Storage Management Subsystem (SMS) parameters. For more information, consult your z/OS documentation.

    • **Specify IBM's SMS Parameters**

      If you chose to require Storage Management Subsystem (SMS) parameters on the previous page, enter them here. For more information, consult your z/OS documentation.

    • **Specify Parameters**

These are all parameters that are used in various DD statements throughout the installation. For more information, consult your IBM JCL documentation.

- **Specify Entry Point**

  Specify the parameters for various ways that SAS can be run with different performance implications. Choose **SAS** (default ENTRY point) to run the unbundled configuration. Choose **SASB** to run the bundled configuration. Choose **SASLPA** to run the bundled configuration with some modules installed in the Link Pack Area (LPA).

- **Specify Parameters**

  Specify additional parameters for DD statements. VOLDISK designates the VOLSER that the installed data sets will go to. For more information, consult your IBM JCL documentation.

- **Specify Parameters**

  Specify parameters used for reblocking the SAS load modules to a library with an optimum block size.

20. Deselect any languages that you do not want SAS to support. By default, SAS attempts to support all languages that your machine's operating system is configured for.

21. Review the list of required third-party software that is required for the SAS software that you are installing on the current machine. (The list of third-party software depends on the SAS software that you are installing on the current machine.)

22. In the pages that immediately follow, be prepared to provide paths to these third-party applications. (The number of wizard pages varies depending on the SAS software that you are deploying on the current machine.)

    Note: You must provide valid paths to the requested third-party software, or the SAS Deployment Wizard will *not* let you continue with the installation.

23. The SAS Deployment Wizard has finished collecting installation input. This is the last opportunity to go back and change any information that you have provided in previous pages before the wizard begins writing to your system.

    Make one of the following choices:

    - Select **Start** to begin installing SAS files to the current machine.

    - Select **Back** to navigate to earlier wizard pages to change installation information previously entered.

    - Select **Cancel** to terminate the wizard session. Note that you will lose installation information previously entered.
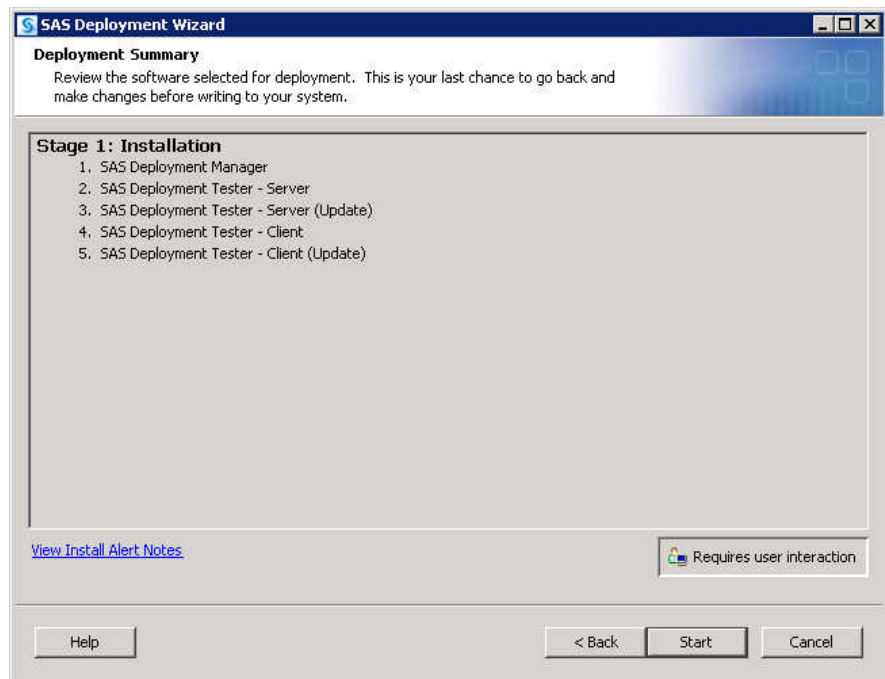
When you see a page similar to the following, the SAS Deployment Wizard is finished:
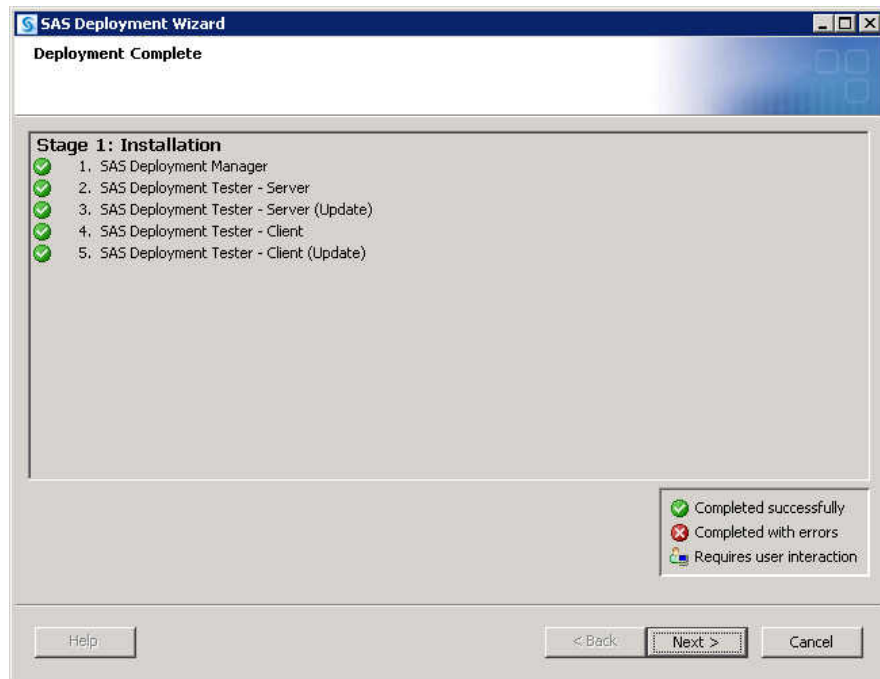
24. Click **Next** to go to the Additional Resources page.
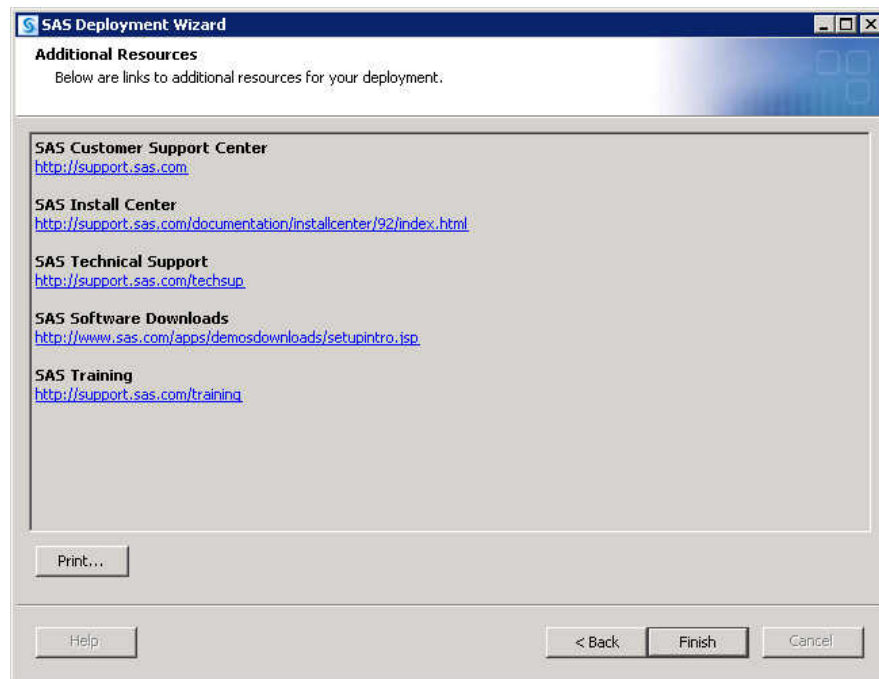
25. Click **Finish** to close the deployment wizard.

26. To configure the SAS products that you just installed, proceed to "Configure SAS Products" on page 182.

What Is Configuring and Unconfiguring?

This document uses the terms *configuring* and *removing a configuration* (unconfiguring) in the following ways.

- configuring

  In addition to installing products, the SAS automated deployment tools also configure products. In most deployment scenarios, you install and configure in one SAS Deployment Wizard session. But, because the deployment wizard enables you to separate installation and configuration into separate tasks, it is possible that you can install a SAS product and then configure it later by rerunning the wizard. Therefore, you *configure* SAS products that have been installed on your system that have not yet been configured.

  For more information, see "Configure SAS Products" on page 182.

  Your SAS configuration is affected when you add SAS products to deployment that require configuration.

  For more information, see "Configuring SAS Products" on page 182.

- removing a configuration

  Deleting one or more product configurations is referred to as removing a configuration. The following scenarios for removing SAS product configurations are common:

  - uninstalling a SAS product

- adding new SAS products that require you to remove the current configuration before configuring it again

- correcting configuration errors

For more information, see "Removing a SAS Configuration" on page 194.

Configuring SAS Products

About Configuring SAS Products

You can configure SAS products that are new to your deployment, or configure SAS products that you are updating or upgrading:

- "Configure SAS Products" on page 182
- "Configure Updated or Upgraded SAS Products" on page 189

Configure SAS Products

Follow these steps to use the SAS Deployment Wizard to configure SAS products that you have already installed.

1. Make sure that the machine where you want to add the new SAS 9.3 software contains the necessary user accounts, groups, and ports.

   For more information, see "Setting Up Users, Groups, and Ports" on page 5.

2. Back up your metadata repository and repository manager on the SAS Metadata Server machine. For more information, see Chapter 11, "Best Practices for Backing Up and Restoring Your SAS Content," in *SAS Intelligence Platform: System Administration Guide*.

3. Make a backup copy of your SAS 9.3 configuration directories by using your site-approved method. Your SAS configuration directories are all the child directories beneath the configuration path that was specified during the initial SAS 9.3 deployment on the Specify Configuration Information on page 107 wizard page.

4. If you are reconfiguring SAS Web Parts for Microsoft SharePoint that was deployed manually, read the following topic before proceeding: "Reconfiguring SAS Web Parts for Microsoft SharePoint" in Chapter 16 of *SAS Intelligence Platform: Web Application Administration Guide*.

5. Make sure that your SAS server and middle tiers are running. Your Web application server (JBoss, WebSphere Application Server, or WebLogic Server) should *not* be running.

   For more information, see "Operating Your Servers" in Chapter 5 of *SAS Intelligence Platform: System Administration Guide*.

6. Make sure that you use a deployment plan that contains any add-on products as well as all original products for the machine that you are configuring.

Table A3.4 Where is My Deployment Plan?

SAS 9.3 Products Being Added	Location of My Deployment Plan
Are part of my original SAS 9.3 order	In the **plan_files** directory in the original SAS Software Depot
Are on a machine where a SAS 9.3 server, middle tier, or data tier already resides	In the SAS configuration directory in the **Utilities** directory
Are part of my new SAS 9.3 order	In the **plan_files** directory in the SAS Software Depot

7. Log on to the machine on which you want to add the new SAS 9.3 products as the SAS Installer user. This is the user with which your SAS deployment was installed. For more information, see "Required External User Accounts for SAS" on page 8.

8. Start the SAS Deployment Wizard from the highest-level directory in your SAS Software Depot using the command appropriate for your operating system.

   Note: If you want to use a different Java Runtime Environment, you must invoke the deployment wizard with a special start up option, **-forcejreprompt**. For more information, see "Specify a Different JRE" on page 167.

Table A3.5 Start Up Commands for the SAS Deployment Wizard

Operating System	Command
Windows	**setup.exe -record -deploy**
UNIX	**setup.sh -record -deploy**
z/OS	**setup.rexx -record -deploy** To use a temporary directory other than **/tmp**, specify **-templocation** *new-temp-dir*.

For more information, see "Creating SAS Software Depots" on page 30.

You should see a welcome page similar to the following:

9. Select the language that you want the SAS Deployment Wizard to use when it displays text.

10. Select **Install SAS Software**.

11. If you have more than one SAS software order in your depot, the wizard prompts you to select the order that you want to configure.

12. If the wizard detects that there are SAS software products in your order that are more recent than what you have deployed on your machine, then the wizard automatically goes into Update mode.

    For more information, see "Adding, Updating, and Upgrading SAS Software" on page 162.

    If you need to install product updates, then follow these steps:

    a. Install the updates using the SAS Deployment Wizard.

       SAS 9.3 Guide to Software Updates.

    b. When you are finished performing any required manual configuration steps, rerun the SAS Deployment Wizard.

13. Select **Perform a Planned Deployment** and **Configure SAS Software**.

    Note: Make sure that **Install SAS Software** is deselected.
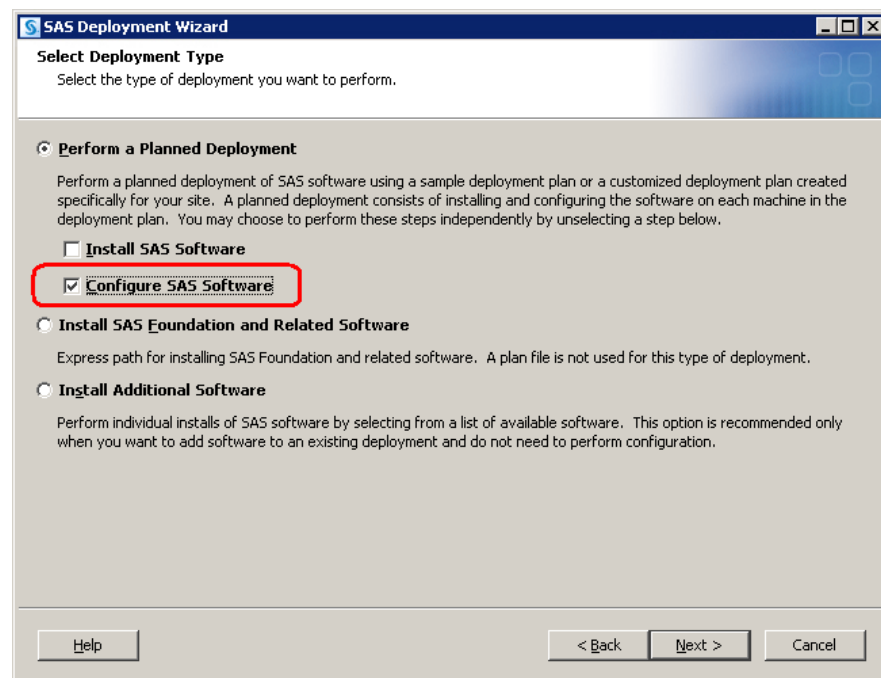
14. Specify the type of deployment plan that you are using.

    • customized deployment plan

      Choose **Specify the full path to a customized deployment plan**, and then click **Browse** to navigate to the plan file.

    • standard deployment plan

      Choose **Select a standard deployment plan**, and then choose the appropriate plan in the drop-down list.
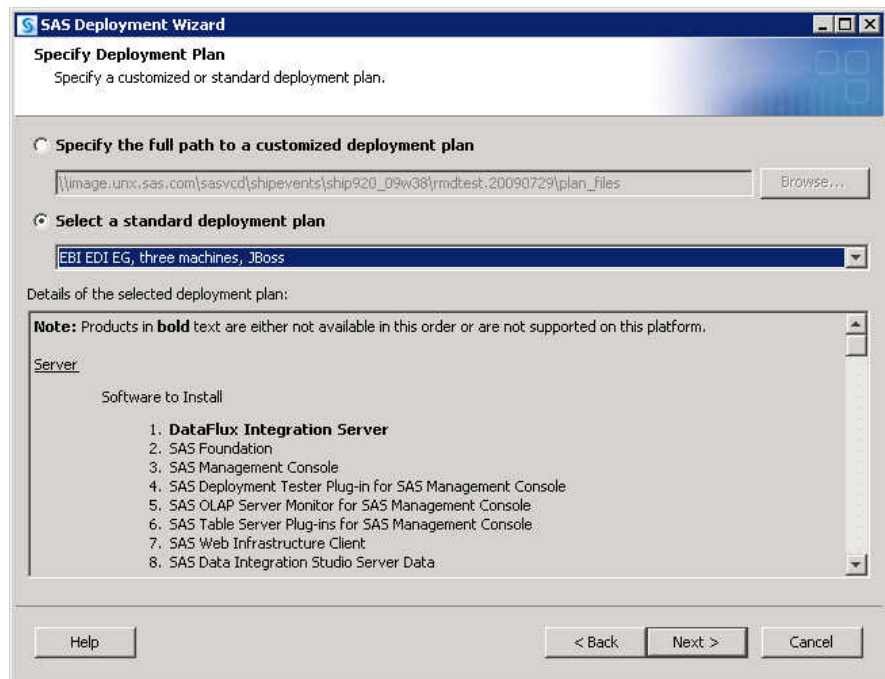
15. If there are multiple machines in your SAS deployment, select the machine on which you are configuring.

    The deployment wizard lists the SAS products in your order that should be installed on the machine.

16. Choose either the **Typical** or the **Custom** configuration prompting level. You want to be able to access the configuration page where you can set the SAS Metadata Server. The Express prompt level does not allow you to access this SAS server configuration setting.

    Note: When adding SAS 9.3 products that require configuring, make sure that you specify the metadata repository name if the one that you are using has a name other than the default (Foundation). To access the deployment wizard page to specify a custom repository name, choose the Custom configuration prompting level.

    Refer to "Overview of Configuration Options by Prompt Level" on page 143 for more information about the SAS Deployment Wizard prompting levels.

17. On the Specify Configuration Information page, specify the configuration directory and level for your current SAS deployment to which you are adding the new configuration.

18. If you are adding the products that you are configuring to an existing SAS deployment, you are asked to confirm your selection.

19. In the Select Products to Configure page, choose only those products that you want to configure on the machine.

    The SAS Deployment Wizard has queried the metadata about your current configuration and checked the appropriate products to be configured.

We recommend that you accept the product selections displayed on this page.

Note: Any time you configure your deployment, you must also configure your Web application server, even if your configuration does not involve your SAS middle tier. If you manually configured the Web application server when you deployed SAS 9.3, then configure it again manually. If the deployment wizard automatically configured your Web application server, then choose the automatic configuration option.
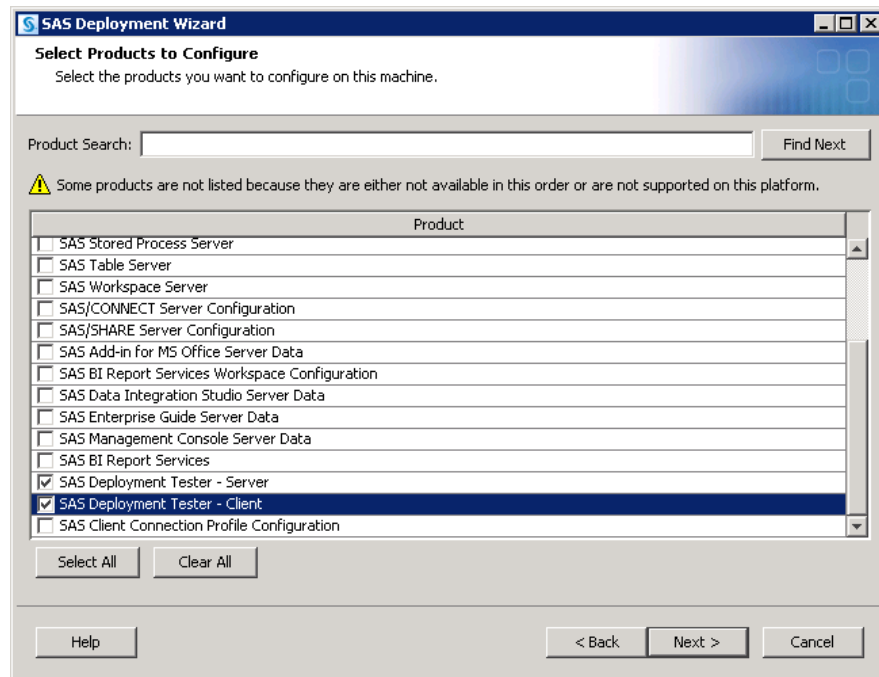
20. Provide the remaining configuration information as the wizard prompts you for it. (The actual number of configuration pages that you must provide input for depends on the prompt level that you chose.) For more information, see Step 9 on page 99 in the topic, "Install and Configure SAS Interactively."

21. When you see the Deployment Summary page, the deployment wizard has finished collecting configuration input. This is the last opportunity to go back and change any information that you have provided in previous pages before the wizard begins writing to your system.

    Make one of the following choices:

    • Select **Start** to begin writing the configuration to the current machine.

    • Select **Back** to navigate to earlier wizard pages to change configuration information previously entered.

    • Select **Cancel** to terminate the wizard session. Note that you will lose configuration information previously entered.
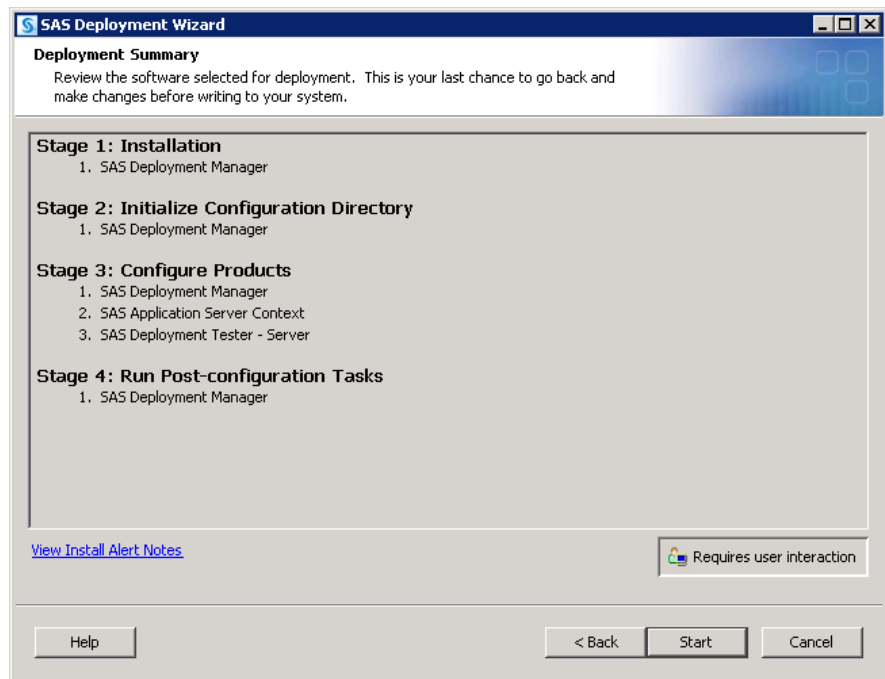
When you see a page similar to the following, the SAS Deployment Wizard is finished:

22. Click **Next** to go to the Additional Resources page.
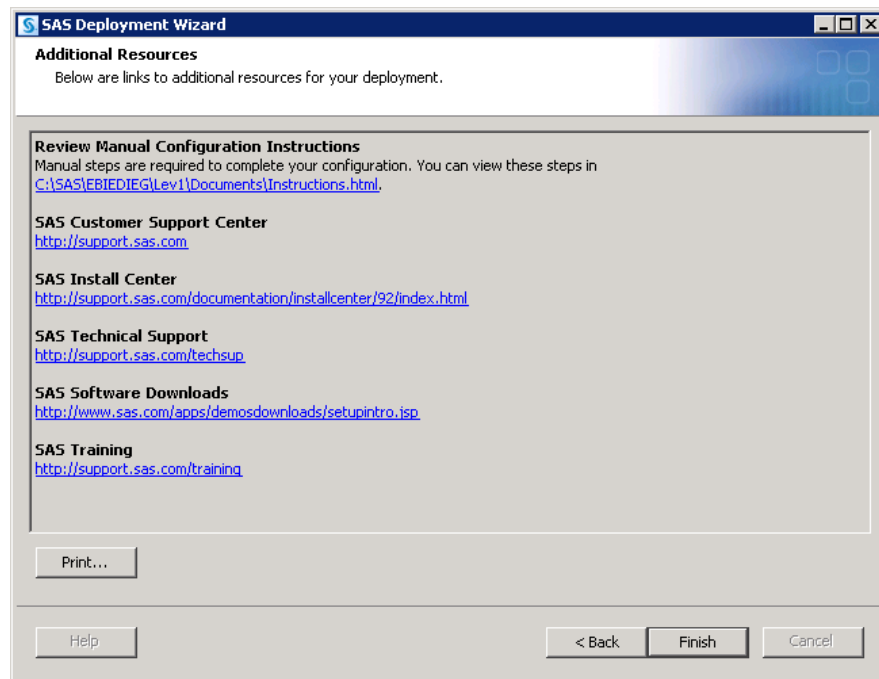
23. Click **Review Manual Configuration Instructions** and complete any necessary manual configuration steps.

    The SAS Deployment Wizard writes the Instructions.html file to the Documents directory on the SAS configuration path. For example:

    • UNIX and z/OS:

      `/opt/SAS/Lev1/Documents/Instructions.html`

    • Windows:

      `C:\SAS\Config\Lev1\Documents\Instructions.html`

   *Note:* The wizard backs up your previous Instructions.html file to the `Backup` subdirectory under the `Documents` directory on the SAS configuration path (for example, `C:\SAS\Config\Lev1\Documents\Backup\Instructions.html_`*YYYY-MM-DD-HH.MM*`.bak`).

24. Click **Finish** to close the deployment wizard.

25. When you are configuring SAS Web applications, restart the SAS Services Application (Remote Services).

    On Windows, you must restart the SAS Services Application (Remote Services) from a Windows command line, using the RemoteServices.bat -start command. For more information, see "Starting or Stopping the SAS Services Application (Remote Services)" in Chapter 5 of *SAS Intelligence Platform: System Administration Guide*.

26. For multi-machine deployments, back up your metadata repository and your SAS configuration directory before you run the SAS Deployment Wizard on the next machine called for by your deployment plan.

    • Make a backup copy of your SAS 9.3 configuration directories by using your site-approved method. Your SAS configuration directories are all the child directories beneath the path that you specified earlier in this procedure on the Specify Configuration Information wizard page.

- Back up your metadata repository and repository manager on the SAS Metadata Server machine. For more information, see Chapter 11, "Best Practices for Backing Up and Restoring Your SAS Content," in *SAS Intelligence Platform: System Administration Guide*.

27. When you are finished completing any manual configuration tasks, and you have made the necessary backups, repeat these steps listed in this topic on each machine defined in your deployment plan.

28. If you have installed or upgraded a SAS Web application that offers online Help, you will have to rebuild the SAS Help Viewer for Midtier Applications. For more information, see Appendix 7, "Rebuilding the SAS Web Applications," in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

29. When you are finished installing and configuring SAS on each machine called for in your deployment plan, proceed to the section, "Validate the SAS 9.3 Servers" on page 121.

    Note: If you encounter error messages about your SAS license expiring, you might need to perform another procedure to correct this. For more information, see "About Adding a SAS Solution to Your Deployment" on page 204.

Configure Updated or Upgraded SAS Products

Follow these steps to use the SAS Deployment Manager to configure SAS products for which you have already installed updates or upgrades.

Note: Starting with the March 2012 release of SAS 9.3, the SAS deployment wizard and the download manager can be run on operating systems that do not have windowing systems. For more information, see the *SAS Deployment Wizard and SAS Deployment Manager User's Guide* available at: **http://support.sas.com/documentation/installcenter/en/ikdeploywizug/64204/PDF/default/user.pdf**

1. Make a backup copy of your SAS 9.3 configuration directories by using your site-approved method. Your SAS configuration directories are all the child directories beneath the configuration path that was specified during the initial SAS 9.3 deployment on the Specify Configuration Information wizard page.

2. Back up your metadata repository and repository manager on the SAS Metadata Server machine. For more information, see Chapter 11, "Best Practices for Backing Up and Restoring Your SAS Content," in *SAS Intelligence Platform: System Administration Guide* .

3. Make sure that your SAS server and middle tiers are running.

   For more information, see Chapter 5, "Operating Your Servers," in *SAS Intelligence Platform: System Administration Guide* .

4. If you are reconfiguring SAS Web Parts for Microsoft SharePoint that was deployed manually, read the following topic before proceeding: "Reconfigure a Manual Deployment of SAS Web Parts for Microsoft SharePoint" in Chapter 16 of *SAS Intelligence Platform: Web Application Administration Guide* .

5. Log on to the machine on which you want to update the SAS product configuration as the SAS Installer user. This is the user with which your SAS deployment was installed and updated. For more information, see "Required External User Accounts for SAS" on page 8 .

6. On the host machine for the products whose configurations you are updating, navigate to SAS-installation-directory**/SASDeploymentManager/9.3** and launch **config.exe** (Windows), **config.sh** (UNIX), or **config.rexx** (z/OS). On Windows, you can use the shortcut on the **Start** menu.

7. In the SAS Deployment Manager, select **Update Existing Configuration**.
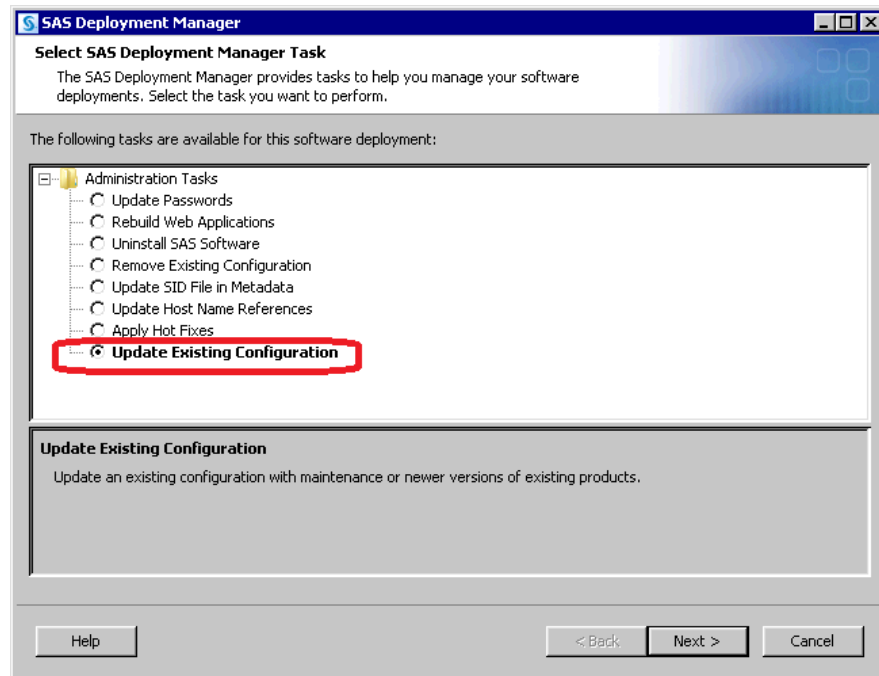
8. In the next page, specify the configuration directory and the level (for example, **Lev1**) that you want to update.

    Note: Any time that you configure your deployment, you must also configure your Web application server, even if your configuration does not involve your SAS middle tier. If you manually configured the Web application server when you deployed SAS 9.3, then configure it again manually. If the deployment wizard automatically configured your Web application server, then choose the automatic configuration option.

9. If you are running in a UNIX environment, restart the SAS Metadata Server:

    a. At a UNIX prompt, navigate to the directory where the SAS Metadata Server is configured.

    b. Enter **`./MetadataServer.sh start`** .

10. In the next page, enter the user ID and password for an unrestricted administrative user.

11. If you are configuring a SAS product that involves the WebSphere Web application server, you are prompted if you are using WebSphere Admin Security. Make your selection and click **Next**.

12. If you are using WebSphere Admin Security, then on the Web Application Server Administrator page, enter the user ID and password for the administrator and click Next.

13. When you see the Summary page, the deployment manager has finished collecting configuration input. This is the last opportunity to go back and change any information that you have provided in previous pages before the manager begins writing to your system.

   • Select **Start** to begin writing the configuration to the current machine.

   • Select **Back** to navigate to earlier manager pages to change configuration information previously entered.

   • Select **Cancel** to terminate the manager session. Note that you will lose configuration information previously entered.
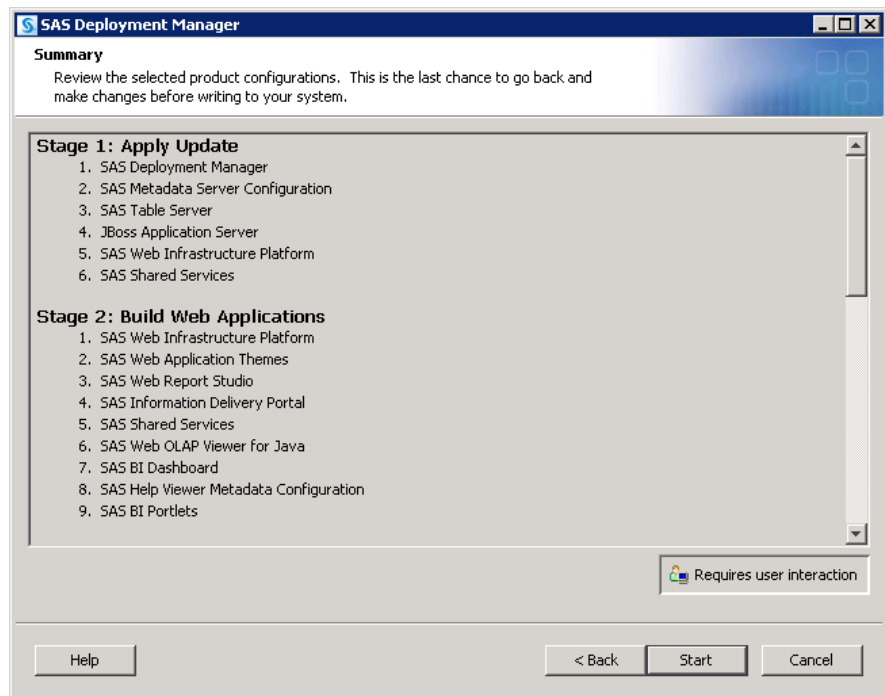
During the configuration process, SAS automatically restarts your SAS servers, configures your Web application servers, and rebuilds and redeploys your SAS Web applications.

When you see a page similar to the following, the SAS Deployment Manager is finished:
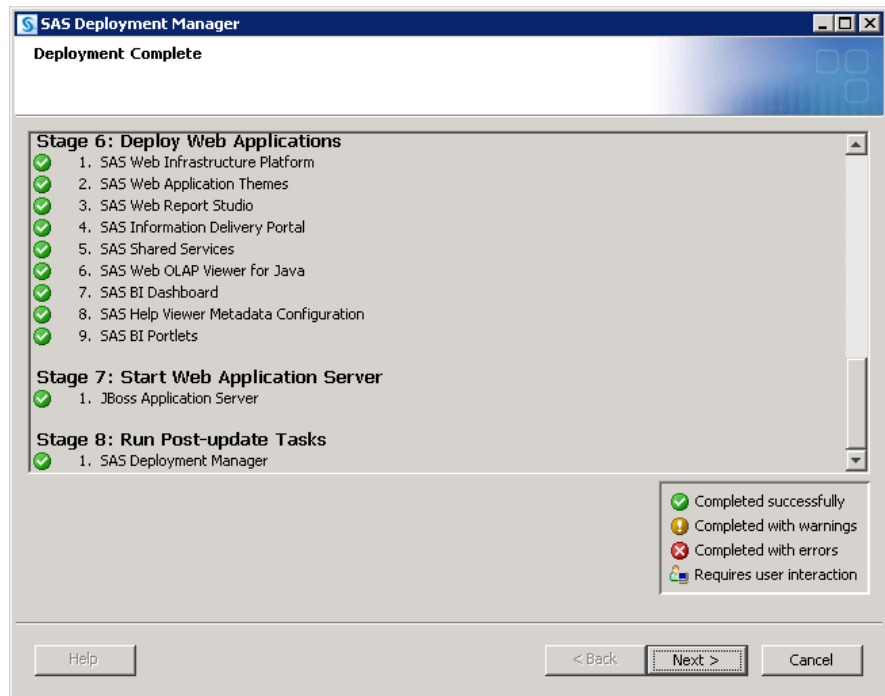
14. Click **Next** to go to the Additional Resources page.
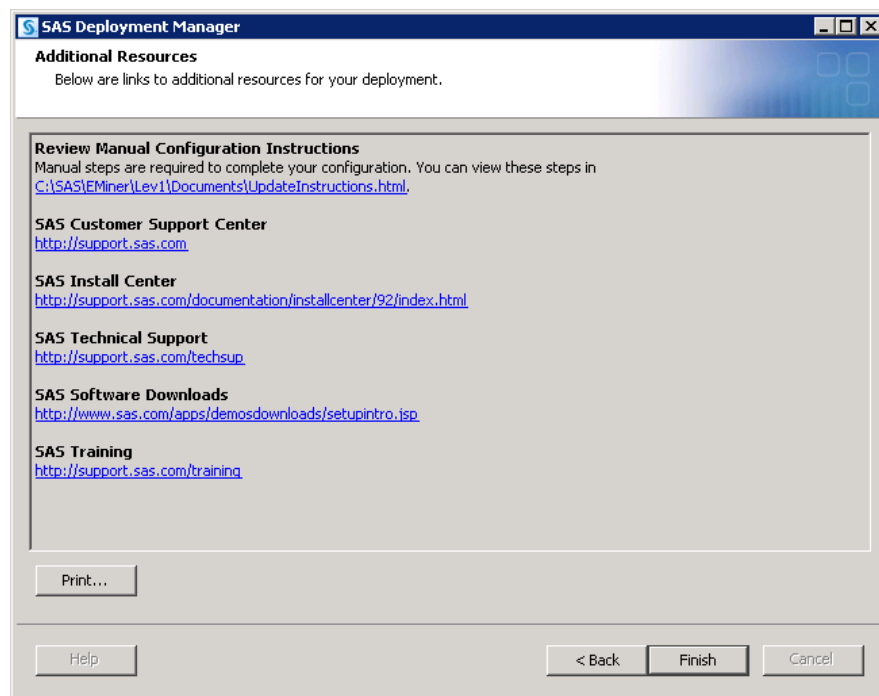
15. If your configuration:

- encountered errors

   The first link on the Additional Resources page goes to the ConfigurationErrors.html file. Click this link and follow the instructions to debug your configuration.

- encountered no errors

The first link on the Additional Resources page goes to the UpdateInstructions.html file. Click this link and follow the instructions to complete any manual steps necessary to complete your configuration.

The SAS Deployment Manager writes its HTML pages to the Documents directory on the SAS configuration path. For example:

- UNIX and z/OS:

  /opt/SAS/Lev1/Documents/UpdateInstructions.html

- Windows:

  C:\SAS\Config\Lev1\Documents\UpdateInstructions.html

  Note: The manager backs up your previous HTML files to the Backup subdirectory under the Documents directory on the SAS configuration path (for example, C:
  \
  SAS\Config\Lev1\Documents\Backup\UpdateInstructions.html_
  *YYYYMM-DD–HH.MM***.bak**).

16. Click **Finish** to close the deployment manager.

    Detailed log messages are written to a file called *product-name***_updateConfigure_date-and-time.log**, where *product-name* identifies the product that was configured. The deployment manager writes this file to *SAS-configuration-directory***\Levn\Logs\Configure**.

Removing a SAS Configuration

Overview of Removing a SAS Configuration

The following topics are contained in this section:

The Remove Existing Configuration feature of the SAS Deployment Manager provides an automated way to remove one more products of a SAS Intelligence Platform configuration from your environment. With this feature, you can remove the configurations of all SAS products or just selected products from a machine. You can remove configuration information only, or you can also remove associated user-created content. (For more information about the other Deployment Manager features, see "Overview of SAS Deployment Manager and SAS Web Administration Console" in Chapter 2 of *SAS Intelligence Platform: System Administration Guide*.)

Note: You can automate running the deployment manager when you need to perform the same configuration action on many machines in your deployment. The deployment manager uses the same record and playback mechanism as the SAS Deployment Wizard to perform a non-interactive, silent configuration. For more information, see "Overview of Automating the SAS Installation on Multiple Machines" on page 124.
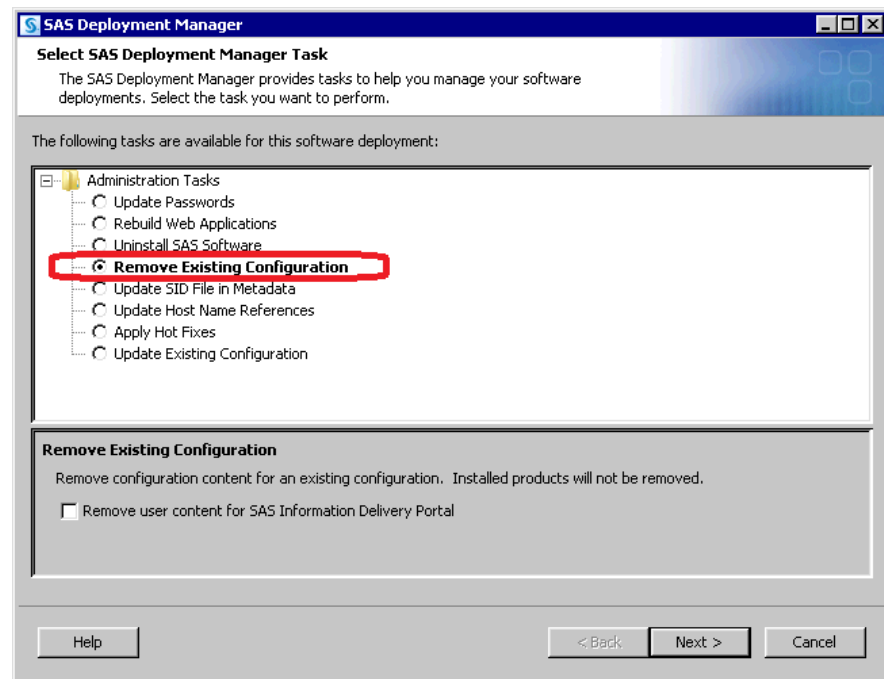
Note: The SAS Deployment Manager does not uninstall or otherwise affect the SAS
   software that is located in the SAS installation directory. To uninstall SAS software,
   see "Overview of Uninstalling the SAS Intelligence Platform" on page 209.

The Remove Existing Configuration feature of the SAS Deployment Manager is useful
for the following purposes:

- to remove a product that you will no longer be using

- to move a product (for example, a SAS Application Server) from one machine to
  another. In this situation, you would do the following:

  1. Use the SAS Deployment Manager to remove the product's (and any dependent
     product's) configuration from the first machine.

  2. Use the SAS Deployment Wizard to install and configure the product on the
     second machine.

- to recover from errors in the initial configuration of a product or to implement
  different configuration options for a product. In these situations, you would do the
  following:

  1. Use the SAS Deployment Manager to remove the product's configuration.

  2. Use the SAS Deployment Wizard to configure the product on the same machine,
     and select different configuration options than you selected previously.

When you remove a product's configuration, the SAS Deployment Manager performs
the following tasks:

- stops the product (or the associated service) if it is running, as well as any dependent
  products (or associated services). For example:

  - If you are removing the configuration of a running OLAP server, then it stops the
    server. If the server is installed as a Windows service, then it stops the service.

  - If you are removing the configuration of a running metadata server, then it stops
    the server (or the associated Windows service). It also stops any running servers
    and services that depend on the metadata server, OLAP servers, stored process

servers, framework data servers, workspace servers, pooled workspace servers, batch servers, SAS/SHARE servers, and SAS/CONNECT servers.

Note: The SAS Deployment Manager does not stop the object spawner. You must do this manually.

- If you are removing the configuration for SAS Foundation Services, then it stops the SAS Services Application (Remote Services) or the associated Windows service.

• deletes metadata objects that contain the product's configuration information. For example, if you remove a server configuration, then the server's metadata definition is removed and the server no longer appears in the Server Manager tree in SAS Management Console.

• on Windows systems, deletes shortcuts that are associated with the product. For example, if you remove a server configuration, then any shortcuts for starting, stopping, pausing, or resuming the server are deleted.

• on Windows systems, deletes the service (if applicable) that is associated with the product. For example, if you remove a server configuration, and if the server runs as a Windows service, then the service is removed.

• deletes configuration files and directories that are associated with the product. For example, if you remove the configuration for a SAS OLAP server, then the server's configuration directory, files, scripts, **sasusers** directory, and logs directory are deleted. The only exception is sasv9_usermods.cfg, which is retained if its contents have changed since the initial installation.

• deletes site-specific portal content if you are removing the configuration for the SAS Information Delivery Portal and if you select the option to **Remove user content for SAS Information Delivery Portal**. The content that is removed includes portal pages; portlets; changes to page navigation, page layout, and package sort order; and other similar customizations.

• determines whether other products in your deployment depend on the removed products. If dependent products exist, and if you have not selected those products for removal, then the SAS Deployment Manager prompts you to remove them. For example, the SAS BI Dashboard depends on the SAS Information Delivery Portal. If you choose to remove the configuration for the SAS Information Delivery Portal, but you do not also choose to remove the configuration for the SAS BI Dashboard, then the SAS Deployment Manager prompts you to include it for removal. For more information about dependencies, see "Identify Dependent SAS Products" on page 198.

• creates an HTML page that lists the items that were removed and describes any additional manual tasks that you need to perform. The page is created in a temporary location. You should save it to a permanent location on your network or file system.

• writes detailed log messages to a file called *product-name*_**unconfigure**_*date-and-time*, where *product-name* identifies the product that was removed. The deployment manager writes this file to *SAS-configuration-directory***Lev***n***Logs\Configure**.

Summary of Steps for Removing a SAS Configuration

Here is a summary of the steps that you should take when removing a configuration:

1. Determine which products' configurations to remove.

2. Determine which products depend on the products that you are removing. You will need to remove the configuration for each of these products. For details, see "Identify Dependent SAS Products" on page 198.

3. Remove SAS product configurations in reverse order in which they were installed:

   a. Remove SAS client configurations first.

   b. Remove the middle tier with other Web applications (such as SAS BI Dashboard, SAS Web Report Studio, and so on).

   c. Remove the middle tier with SAS Web Infrastructure Platform.

   d. Remove the middle tier with SAS Foundation Services (that is, Remote Services).

   e. Remove the SAS application servers (such as workspace or stored process servers) on machines other than the metadata server machine.

   f. Remove the metadata server last.

4. For each product that you plan to remove, identify the machine where it is installed.

   Note: On Windows, in order to run the SAS Deployment Manager, you must be a member of the machine's Windows Administrator group.

   In a single-machine installation, you can remove the configurations of multiple products as well their dependent products in a single execution of the SAS Deployment Manager.

   In a multiple-machine installations, you should remove middle-tier products first. Then remove products on the SAS server tier. If you are removing the metadata server, you should remove it last.

5. Create a complete backup of your system before removing a configuration. This backup should include a correct backup of the metadata server. (See Chapter 11, "Best Practices for Backing Up and Restoring Your SAS Content," in *SAS Intelligence Platform: System Administration Guide*.) This step is important because it is not possible to undo the removal of a configuration.

6. If you are removing a server, you might want to stop the server (or its associated service), although this is not required. However, you must stop the object spawner if you are removing one of the servers that it runs.

   Note: The only exception is the metadata server, which must be running.

7. If you are unconfiguring a SAS Web application, then depending on the operating system and the Web application server that you are using, do the following:

   • JBoss:

     Always stop the JBoss Web application server before unconfiguring any of the SAS Web applications.

   • WebLogic:

     • On UNIX, keep the WebLogic Web application server running while unconfiguring the SAS Web application.

     • On Windows, always stop the WebLogic Web application server before unconfiguring any of the SAS Web applications. (Make sure that the WebLogic Node Manager is running.)

   • WebSphere:

Ensure that the WebSphere Deployment Manager (dmgr) server and nodeagent server are running while unconfiguring the SAS Web application. All application servers (for example, SASServer1) should be stopped.

8. If you are unconfiguring a SAS middle tier on UNIX, first stop SAS Remote Services before running the SAS Deployment Manager.

9. When all of the preparatory steps are complete, follow the steps that are described in "Remove a Configuration" on page 201.

Identify Dependent SAS Products

If you remove the configuration of a product that another product depends on, then the dependent product would not be able to function. Therefore, when you remove a product's configuration, the SAS Deployment Manager requires that you also remove the configurations of any dependent products.

Product dependencies are shown in the following table. If you remove the configuration for a product in the left column, then you must also remove the configurations for all of the products that are in the right column opposite that product. For example:

- If you remove the SAS BI Dashboard configuration, then you do not need to remove any other products. No products depend on the SAS BI Dashboard.

- If you remove the SAS BI Report Services Workspace Configuration, then you must also remove the following dependent products: BI Report Services, SAS BI Dashboard, SAS Web Report Studio, and SAS Web Report Viewer.

- If you remove the SAS Metadata Server configuration, then you must remove all other products.

Table A3.6 Dependencies in the SAS Intelligence Platform

Product	Dependent Products[*]
SAS BI Report Services	None
DataFlux Data Management Server	None
SAS BI Dashboard Configuration Data	None
SAS BI Lineage Scheduling Server	None
SAS BI Portlets	None
MySQL Database Server	SAS Web Infrastructure Platform database (unless SAS Web Infrastructure Platform database is using the SAS Framework Data Server) SAS Solutions Services
Platform Process Manager	SAS Web Report Studio and SAS BI Dashboard (if report scheduling is enabled via Platform Process Manager)

Product	Dependent Products[*]
Logical server processes in the SAS Application Server Context	All products except Platform Process Manager
SAS BI Dashboard	None
SAS BI Report Services Workspace Configuration	BI Report Services SAS Web Report Studio
SAS Foundation Services	Web application server (JBoss, WebLogic, or WebSphere) SAS BI Dashboard SAS Help Viewer Metadata Configuration SAS Information Delivery Portal SAS Information Delivery Portal JPS Extension SAS Web Infrastructure Platform database SAS Web Report Studio SAS Web Infrastructure Platform SAS Themes SAS BI Portlets SAS Enterprise Miner Mid-Tier SAS Web Infrastructure Platform Extensions for BI Dashboard
SAS Grid Manager Control Server Configuration	SAS Grid Manager Node Configuration
SAS Grid Manager Control Server Configuration (with other grid middleware)	SAS Grid Manager Node Configuration (with other grid middleware)
SAS Information Delivery Portal	SAS BI Dashboard SAS BI Portlets SAS Web Infrastructure Platform database
SASMeta - Logical Metadata Server	All products

Product	Dependent Products[*]
SAS Object Spawner	BI Report Services
	Operating System Scheduling Server
	SAS BI Dashboard
	SAS BI Report Services Workspace Configuration
	SAS Pooled Workspace Server
	SAS Web Infrastructure Platform database
	SAS Stored Process Server
	SAS Web Report Studio
	SAS Workspace Server
SAS Pooled Workspace Server	SAS BI Dashboard
	SAS BI Report Services Workspace Configuration
	SAS Web Infrastructure Platform database (if used by SAS Framework Data Server)
SAS Web Infrastructure Platform database	None
BI Report Services	None
Web Report Studio	None
SAS Solutions Services	None
SAS Stored Process Server	None
SAS Framework Data Server Configuration	SAS Web Infrastructure Platform database and SAS Web Infrastructure Platform and, all its dependent products.(unless SAS Web Infrastructure Platform database is using MySQL Database Server)
SAS Web Infrastructure Platform	SAS BI Dashboard
	SAS BI Portlets
	SAS Information Delivery Portal
	SAS Web Report Studio
	SAS Themes
SAS Enterprise Miner Mid-Tier	None
SAS Web Report Studio	SAS Information Delivery Portal
	SAS BI Dashboard
	SAS BI Portlets

Product	Dependent Products[*]
SAS Workspace Server	SAS BI Dashboard
	SAS BI Lineage Server
SAS Flex Application Themes	None
Web application server (JBoss, WebLogic, or WebSphere)	SAS BI Dashboard
	SAS BI Portlets
	SAS Help Viewer for Midtier Applications
	SAS Information Delivery Portal
	SAS Web Infrastructure Platform database
	SAS Web Report Studio
	SAS Web Infrastructure Platform
	SAS Themes

[*] These products depend on the product in column 1. Therefore, they must be removed if the product in column 1 is removed.

Note: On z/OS, using the SAS Deployment Manager to remove a Web Application Server Network Deployment configuration also removes the Web application server itself from the node. In the third maintenance release of SAS 9.2, the SAS Deployment Wizard does not support configuring a WebSphere Application Server on z/OS. Therefore, contact your WebSphere System Administrator to redefine the node's Web application servers after unconfiguration.

When you remove a product's configuration, the SAS Deployment Manager checks to see whether your deployment plan includes any products that depend on that product. If dependent products exist, and if you have not selected those products for removal, then the SAS Deployment Manager prompts you to remove them.

Remove a Configuration

In a single-machine installation, you can remove the configurations of multiple products as well their dependent products in a single execution of the SAS Deployment Manager.
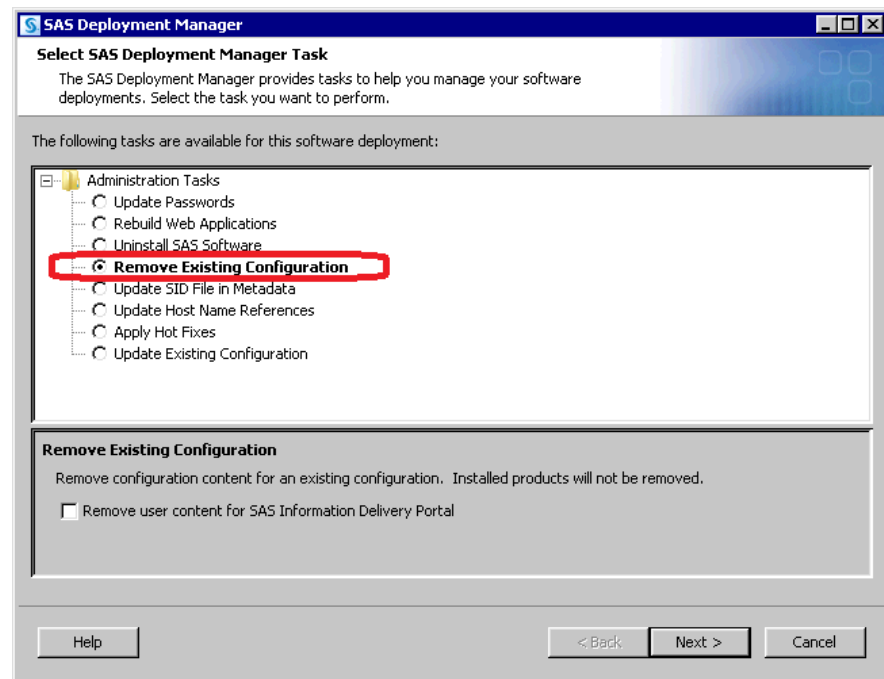
In a multiple-machine installations, you should remove middle-tier product configurations first. Then remove product configurations on the SAS server tier. If you are removing the metadata server configuration, then you should remove it last.

Note: When removing a configuration, the SAS Deployment Manager does not delete any configuration log files associated with the configuration. However, server log files are removed.

Follow these steps to run the SAS Deployment Manager to remove the configurations from each machine:

1. Make sure that you have completed the preparatory steps that are described in .

   Note: On Windows, in order to run the SAS Deployment Manager, you must be a member of the machine's Windows Administrator group.

2. Make sure that you have are removing the SAS configurations in the sequence specified in .

3. On the host machine for the products whose configurations you are removing, navigate to *SAS-installation-directory***/SASDeploymentManager/9.3** and launch **sasdm.exe** (Windows), **sasdm.sh** (UNIX), or **sasdm.rexx** (z/OS). On Windows, you can use the shortcut on the **Start** menu.

4. In the SAS Deployment Manager, select **Remove Existing Configuration**.

   If you are removing the SAS Information Delivery Portal, then you can also select the option to remove user content that is associated with the portal. If you select this option, the SAS Deployment Manager removes portal pages; portlets; changes to page navigation, page layout, and package sort order; and other similar customizations.

   CAUTION:
   Use caution when choosing the option to remove user content for the SAS Information Delivery Portal. The content cannot be recovered unless you have a complete backup of your system.

5. If you have more than one SAS configuration, the wizard prompts you to specify the configuration directory and the level (for example, **Lev1**) from which the configuration is to be removed.

6. In the next page, enter the user ID and password for an unrestricted administrative user.

7. On the next page, select the check boxes for the products that you want to remove. For each product that you select, be sure to also include the other products on the machine that depend on that product (see "Identify Dependent SAS Products" on page 198).

8. Detailed log messages are written to a file called *product-name*`_unconfigure_`*date-and-time*`.log`, where *product-name* identifies the product that was removed. The deployment manager writes this file to *SAS-configuration-directory*`\Lev`*n*`\Logs\Configure`.

9. When the configuration removal is complete, the Additional Resources page is displayed. In this page, click on the following document name:

   configuration-name-and-level`_ConfigurationRemoval.html_`*YYY-MM-DD.HH.MM.SS*`.html`

   The document contains details about the products that were removed and additional manual steps that you might need to perform. The document is created in a temporary location. You should save it on your network or your file system so that you can refer to it later.

For details about what occurs when you remove a configuration, see "Overview of Removing a SAS Configuration" on page 194.

After removing the configuration, you might need to take one of the following additional steps, depending on the reason for the removal:

- run the SAS Deployment Wizard to create a new configuration. For details, see "Configuring SAS Products" on page 182.

- uninstall the associated software (if you will no longer be using the product on the current machine, or if you will be reinstalling the software on the current machine). For details, see "Overview of Uninstalling the SAS Intelligence Platform" on page 209 .

Updating the SID File in Metadata for SAS Solutions

Overview of Updating the SID File in Metadata for SAS Solutions

The following topics are contained in this section:

About Updating the SID File in Metadata for SAS Solutions

There are two situations when you might need to update the SAS installation data (SID) file in metadata for SAS solutions:

- when you add a SAS solution to your SAS 9.3 deployment

- when you need to renew your software license for a SAS solution

About Adding a SAS Solution to Your Deployment

When you deploy a SAS solution, you must update the SID file in metadata using the SAS Deployment Manager from the machine on which the SETINIT for the solution is enabled. For more information, see "Update the SID File in Metadata for SAS Solutions" on page 204.

About Renewing Your Software License for SAS Solutions

SAS 9.3 is shipped with a 30-day initial license, or SETINIT. When your new SETINIT arrives, you must renew it on every machine that runs SAS 9.3 software using the typical method according to your operating system: SAS Renewal Tool (Windows), SAS Setup (UNIX), and RENEW job (z/OS). For more information, see the instructions appropriate for your operating system on the Install Center, located at: **http://support.sas.com/documentation/installcenter/93/index.html** (search for "renewal").

Some SAS 9.3 solutions that depend on a SAS middle tier require you to perform an additional step. You will know when you have to update your middle-tier SETINIT when you receive error messages that your SAS license has expired. You must run the SAS Deployment Manager on the machine that the SETINIT is intended for. During the process, the deployment manager locates the new SETINIT and loads it into SAS metadata, effectively renewing your SAS solution software. (For more information about the other Deployment Manager features, see "Overview of SAS Deployment Manager and SAS Web Administration Console" in Chapter 2 of *SAS Intelligence Platform: System Administration Guide*.)

Update the SID File in Metadata for SAS Solutions

After you add a SAS solution to your deployment, or renew your SAS software, some SAS 9.3 solutions that depend on a SAS middle tier require you to apply the new SETINIT in metadata. This procedure involves using the SAS Deployment Manager to update the SID file in your SAS metadata repository.

Note: You can automate running the deployment manager when you need to perform the same configuration action on many machines in your deployment. The deployment manager uses the same record and playback mechanism as the SAS Deployment Wizard to perform a non-interactive, silent configuration. For more information, see "Overview of Automating the SAS Installation on Multiple Machines" on page 124 .

To apply your new software license for middle-tier SAS solutions, follow these steps:

1. Make sure that you have first done the following:

   - obtained your new SETINIT from your SAS representative.

Your SETINIT is contained in a SAS installation data file (sometimes referred to as a SID) that is attached to your software order e-mail (SOE).

- renewed your software license on each machine that runs SAS 9.3.

  Follow the instructions appropriate for your operating system located at: **http://support.sas.com/documentation/installcenter/93/index.html** (search for "renewal").

- added your newly licensed software to each machine in your deployment.

  For more information, see "Adding SAS Products" on page 168.

2. If you received more than one SID file, you must make sure that you locate the correct one in order to perform the steps that follow. For more information, see "Determine Which SID File to Update in Metadata" on page 208.

3. Make sure that you have saved the new SID file on the machine that the SETINIT is intended for.

   Note: On z/OS machines only, save the new SID file to the following path: *SAS-install-directory*/**SASFoundation/9.3/setinit.sas**. For example:**/usr/lpp/SAS/SAS_93/SASHome/SASFoundation/9.3/setinit.sas**.

4. Make sure that the metadata server is running.

5. Log on to the machine that the SETINIT is intended for as the SAS Installer user.

   This is the user with which your SAS deployment was installed. For more information, see "Required External User Accounts for SAS" on page 8.

6. Navigate to *SAS-installation-directory*/**SASDeploymentManager/9.3** and launch **sasdm.exe** (Windows), **sasdm.sh** (UNIX), or **sasdm.rexx** (z/OS). On Windows, you can use the shortcut on the **Start** menu.

7. In the SAS Deployment Manager, select **Update SID File in Metadata**.
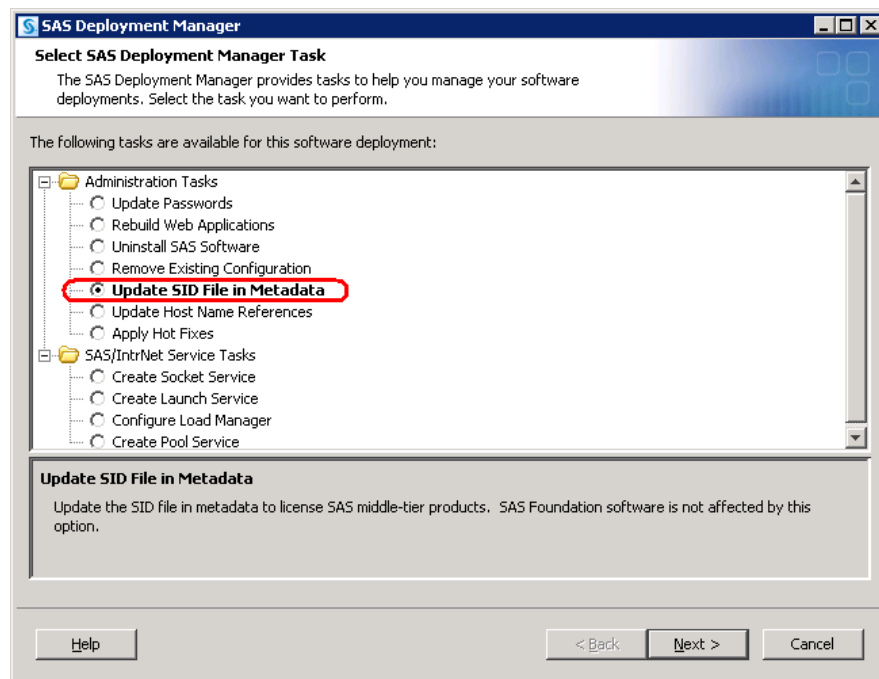
8. On the next page, specify the configuration directory and the level (for example, **Lev1**) for your SAS Solution.
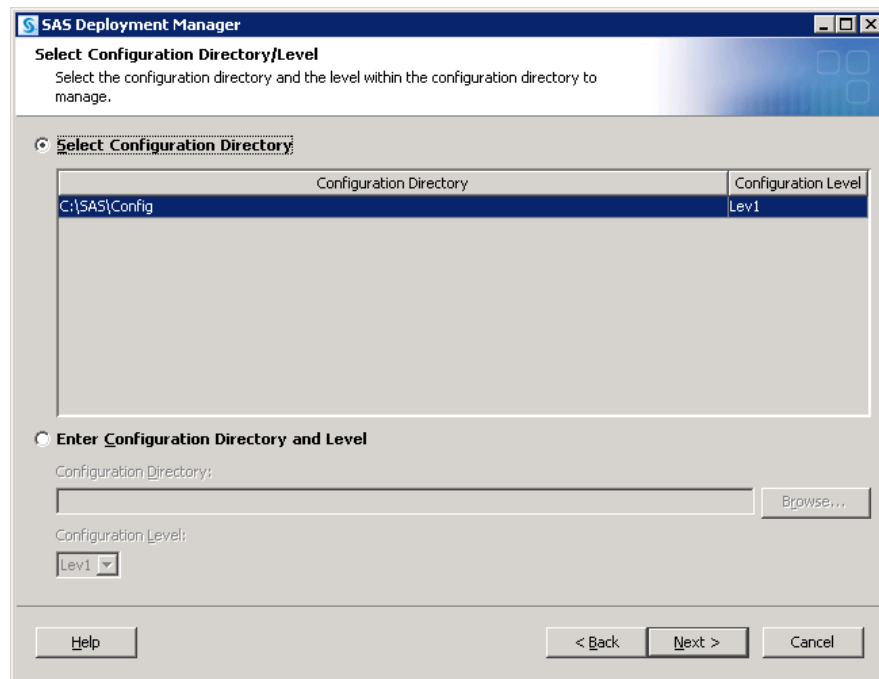
9. On the next page, enter the user ID and password for an unrestricted administrative user.
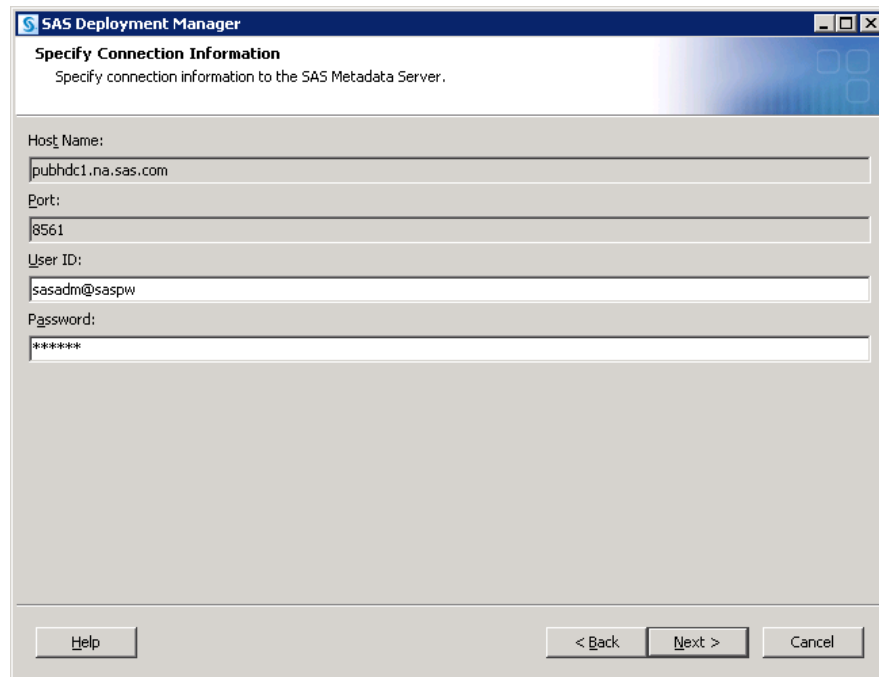
10. On the next page, enter the absolute path to the new SID file on the machine.
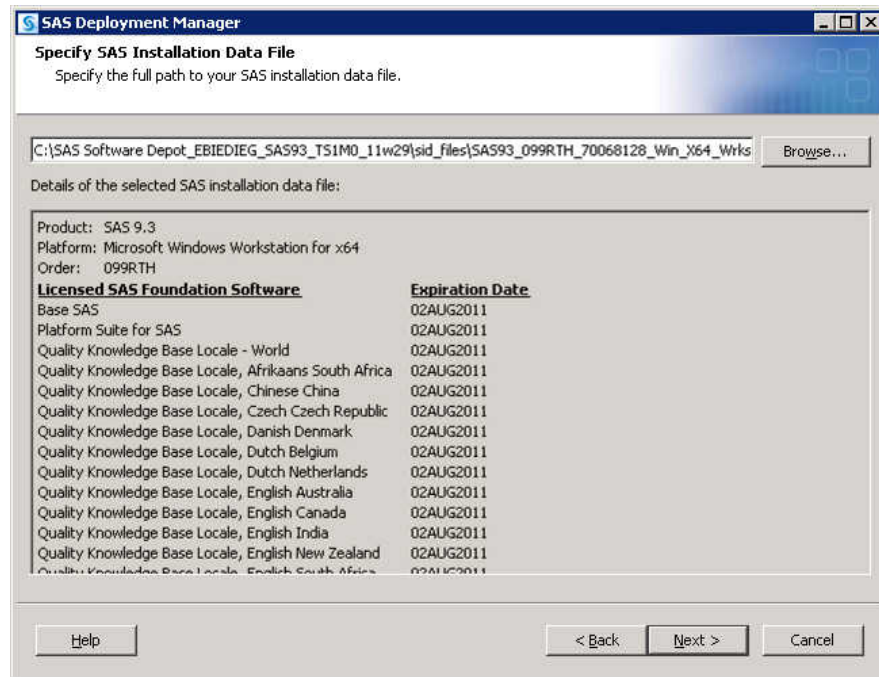
11. Click **Start**.

    When the deployment manager has successfully updated your SETINIT, you should
    see a page similar to the following:
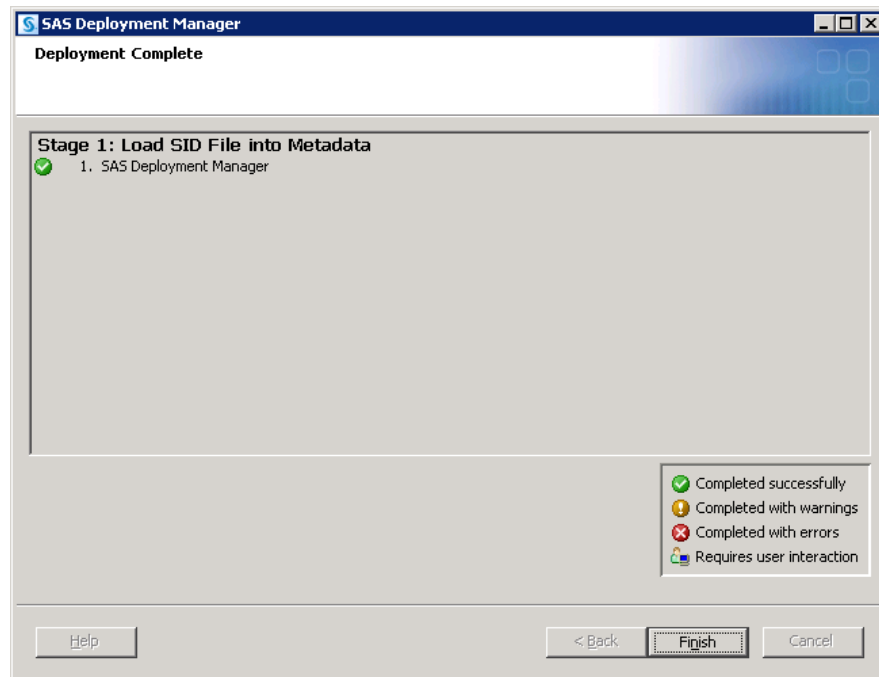
12. Click **Finish**.

    The deployment manager has located the new SETINIT and loaded it into metadata.
    Your SAS solution software has been renewed.

13. Repeat steps 4 - 11 on any other machines that run a SAS Solution.

14. Restart your SAS Web application server.

For more information, see "Starting and Stopping Web Application Servers" in Chapter 5 of *SAS Intelligence Platform: System Administration Guide*.

Note: If you have more than one SAS Web application server, restart the one on which the SASWebInfrastructurePlatformServices9.3 application is running. You can determine which Web application server runs the SASWebInfrastructurePlatformServices9.3 application by consulting your Web application administrative console.

Determine Which SID File to Update in Metadata

If you received more than one SID file, you must make sure that you locate the correct one with which to update your metadata. To determine which SID file to use, follow these steps:

1. Locate the SAS order number that contains the SAS solution that you are adding or whose license you are renewing.

   If you do not know the order number, refer to your software order e-mail (SOE).

2. Locate the tech support site number that contains the SAS solution that you are adding or renewing.

   A listing of the tech support site numbers and the SAS product to which they apply can be found in the soi.html file in your SAS Software Depot located under the `install_doc/`*order-number* subdirectory. For example: `C:\SAS 9.3 Depot\install_doc\111ABC\soi.html`.

3. SID files are named using this convention:

   product_order-number_tech-support-site-number_operating-system.txt

   For example: `SAS93_111ABC_71111111_SUN_Sparc.txt`.

4. Open the SID file and verify that the SAS solution is declared in the file.

5. Record the name of the SID file. You will need to know which SID file to use when performing the steps in "Update the SID File in Metadata for SAS Solutions" on page 204 .

Appendix 4
Uninstalling the SAS Intelligence Platform

Overview of Uninstalling the SAS Intelligence Platform

Remove software from machines deploying SAS 9.3 in the following order:

1. client-tier machines
2. middle-tier machines
3. server-tier machines
4. metadata server machine

To uninstall the SAS 9.3 Intelligence Platform, you need to perform the following steps—where applicable—on each machine in your deployment:

1. Unconfigure your SAS software.

   See "Remove a Configuration" on page 201.

2. Stop SAS servers that are running.

   See "Stopping SAS Servers That Are Running" on page 210.

3. Uninstall your SAS software.

4. Uninstall third-party software.

5. Uninstall the SAS JRE and the JDK.

Stopping SAS Servers That Are Running

Stop SAS Servers That Are Running on Windows

Before uninstalling any software on a machine, you must stop any SAS servers that are running there. To stop SAS servers running on Windows, follow steps:

- Log on to the machine as the SAS Installer user (the user account used to install the SAS Software) or as the Administrator (or a user in the Administrators group).

- Run the Windows Services snap-in (**Start** ⇨ **Control Panel** ⇨ **Administrative Tools** ⇨ **Services**).

- Stop all of the SAS services that are running.

  For more information, refer to your Microsoft Windows documentation.

Stop SAS Servers That Are Running on UNIX

Before uninstalling any software on a machine, you must stop any SAS servers that are running there. To stop SAS servers running on UNIX, follow steps:

- Log on to the machine as the SAS user.

- From the **Lev***n* SAS configuration directory, run the following command:

  ```
  sas.servers stop
  ```

  For example:

  ```
  /opt/SAS/Config/Lev1/sas.servers stop
  ```

Uninstalling Your SAS Software

Overview of Uninstalling Your SAS Software

You should now uninstall the SAS products.

If you are using a Java Runtime Engine (JRE) installed for SAS 9.3 and want to remove that too, remove the JRE as the last step. The SAS Deployment Manager depends on the JRE to uninstall SAS 9.3.

Uninstall SAS on Windows

To uninstall SAS software from a Windows machine, perform these steps:

1. Remove the configurations for any SAS software that you are uninstalling by following the instructions described in, "Remove a Configuration" on page 201 .

2. Make sure that you are logged on as the SAS Installer user (the user account used to install the SAS Software) or as the Administrator (or a user in the Administrators group).

3. Open the Control Panel by selecting **Start** ⇨ **Settings** ⇨ **Control Panel**.

4. From the Control Panel, open the Programs and Features window. (On earlier Windows systems, open the Add or Remove Programs window.)

5. Locate SAS 9.3 in the list of programs and double-click it. (On earlier Windows systems, click **Change/Remove**.)

   The SAS Deployment Manager Choose Language dialog box appears.

6. Select the language that you want the SAS Deployment Manager to use when it displays text.

   The SAS Deployment Manager splash screen appears.

7. On the Select SAS Products to Uninstall page, the SAS products to be uninstalled have a check beside them. (By default, all SAS products are checked.) If there are any SAS products that you want to keep, deselect them. When you have made your selections, click **Next**.
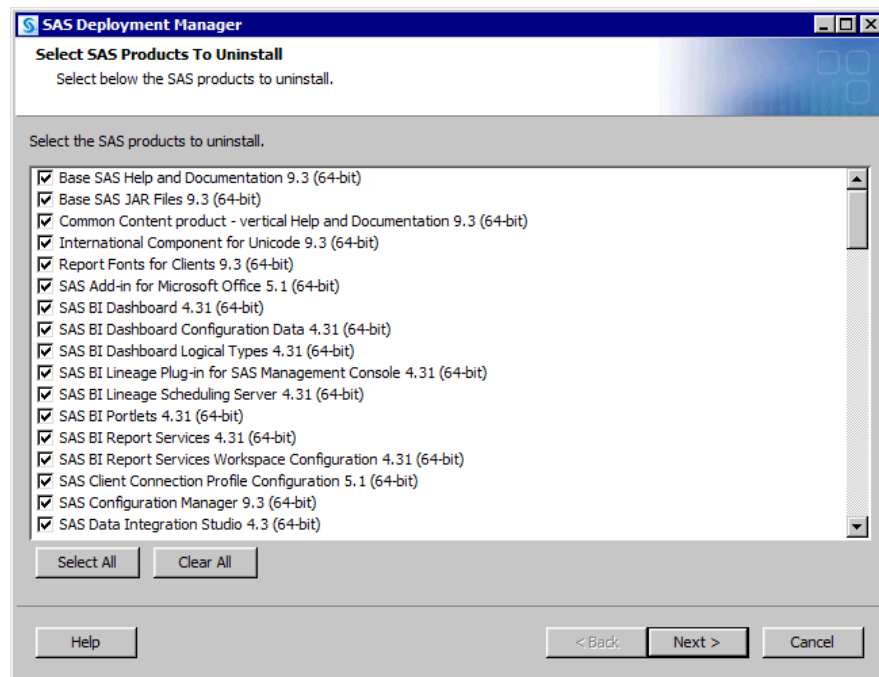
The deployment manager checks your system to make sure that you have Write permission for all of the SAS program files that it is going to remove, and none of the files are locked. If any files meet these criteria, their pathnames appear in the text field. You must unlock the file or make it writeable before the deployment manager enables you to proceed with the uninstall.
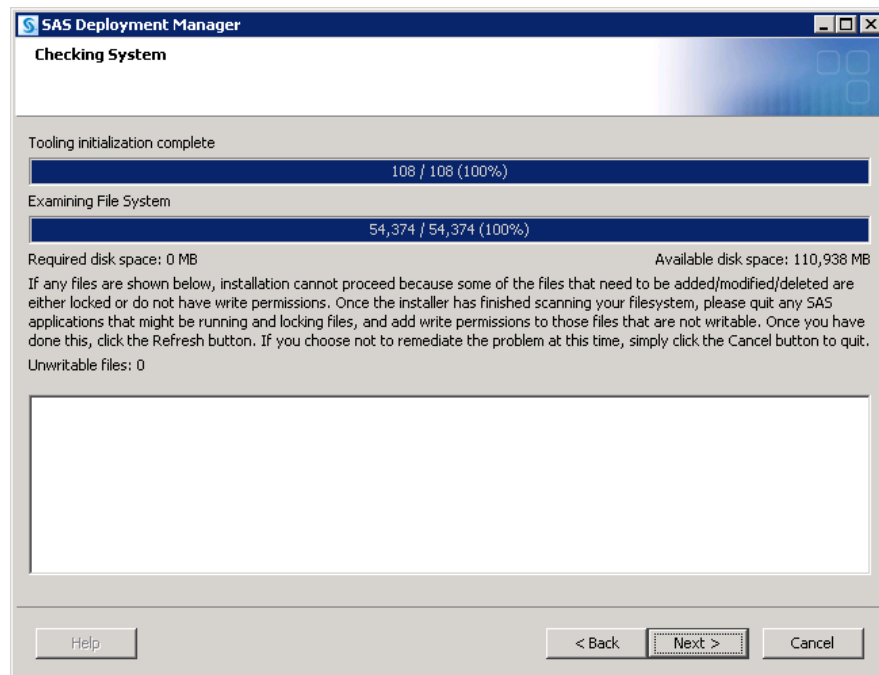
8. Click **Next**.

    The Summary page appears.
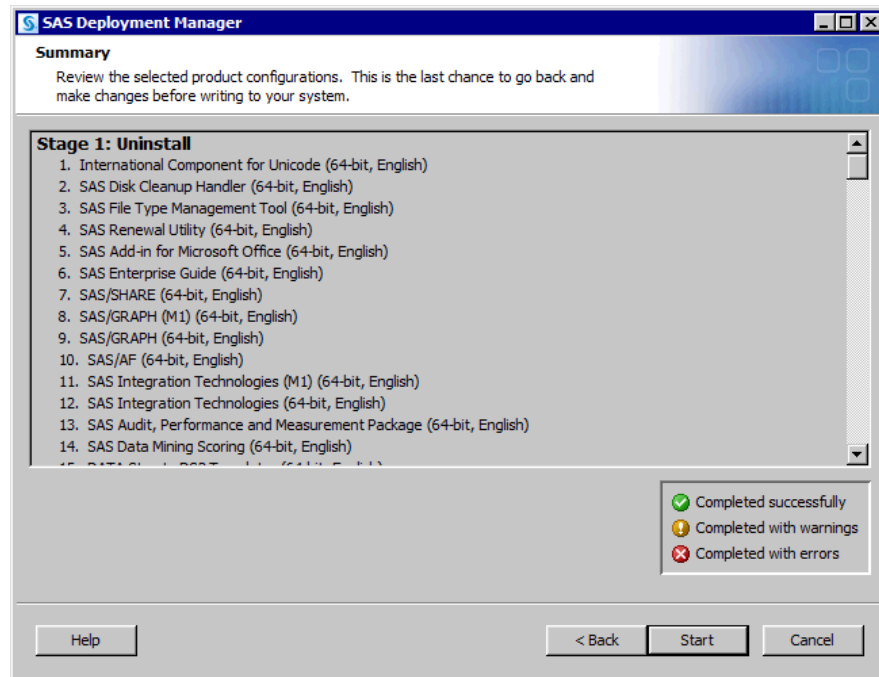
9. If there are any products that you want to keep, click **Back** until to see the Select SAS Products to Uninstall page and deselect the products. Otherwise, click **Start**.

   The deployment manager uninstalls the selected SAS products.

10. When you see the Deployment Complete page, click **Finish**.
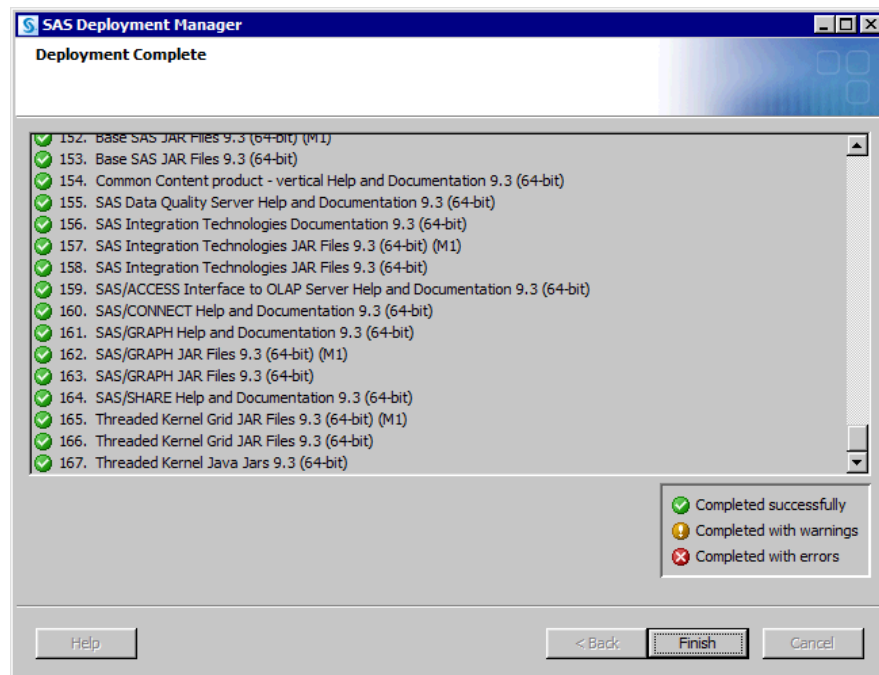
The deployment manager closes.

11. Close the Add or Remove Programs window and the Control Panel.

12. Delete your SAS installation directory (SAS Home) (for example, `C:\Program Files\SAS-installation-directory`).

13. Delete your SAS configuration directory (for example, `C:\SAS\Config\Lev1`).

14. Delete all SAS Windows Start menu shortcuts for All Users and the SAS Installer user (for example, delete the **SAS** directory under **C:\Documents and Settings\All Users**).

15. Delete the SAS directory under **\Local Settings\Application Data** for the SAS Installer user:

    \Documents and Settings*SAS-Installer-ID***\Local Settings \Application Data\SAS**

Uninstall SAS on UNIX

To uninstall SAS software on a UNIX machine, perform these steps:

1. Make sure that you have first unconfigured the SAS software on the machine by following the directions in "Removing a SAS Configuration" on page 194 .

2. Make sure that you have permission to delete files from the SAS home directory (the directory in which your SAS software is installed).

3. Make sure that you have permission to delete files from your configuration directory.

4. Make sure that you are logged on as the SAS Installer user (the user account used to install the SAS Software).

5. Remove the SAS 9.3 installation directories by executing the **rm -rf** command on the top-level SAS 9.3 installation directory. Note that you must *not* **cd** to this directory before executing the command.

   For example, if the top-level SAS 9.3 installation directory is **/opt/SAS/SAS_93**, then you would use the following command:

   ```
   rm -rf /opt/SAS/SAS_9.3
   ```

Uninstalling Third-Party Software

The SAS Intelligence Platform often makes use of third-party products, such as a Web application server. You can determine whether third-party software was deployed on a particular machine by reviewing your deployment plan file (plan.xml). To uninstall these products, use the same procedures that you used to uninstall your SAS software. (See "Uninstalling Your SAS Software.")

The following table shows the main third-party products that are used with the SAS 9.3 Intelligence Platform.

Table A4.1   Third-party Software Typically Used with SAS

Type of Product	Products
Web application servers and servlet containers	• JBoss Application Server • WebLogic Server • WebSphere Application Server
Scheduling servers	• Platform Process Manager

Uninstalling the SAS JRE and the JDK

Deployed Web Applications

Undeploy and delete WAR and EAR files that are deployed to your Web application server or servlet container.

Overview of Uninstalling the SAS JRE and the JDK

After you have uninstalled your SAS software and your third-party software, you can uninstall the Java Runtime Environment (JRE) that SAS uses. If the Java Development Kit (JDK) on the machine was being used only in support of SAS Web applications, you can also remove the JDK.

Windows

To uninstall the JRE and the JDK used by SAS from a Windows machine, perform these steps:

1. Open the Control Panel by selecting **Start** ⇨ **Settings** ⇨ **Control Panel**.

2. From the Control Panel, open the Add or Remove Programs.

3. From the Add or Remove Programs window, remove the products.

4. Close the Add or Remove Programs window and the Control Panel.

UNIX

This procedure applies only if you had the SAS Foundation installed. In any event, proceed with caution.

Note: Make sure that the JRE and JDK are not being used for other software on the machine before you delete the products.

To uninstall the JRE and the JDK used by SAS from a UNIX machine, perform these steps:

1. Locate the directory where these products are installed, and make sure that you have permission to delete files in this directory.

2. Delete the product with uninstallers whenever you can. Otherwise, use the `rm -rf` command on the top-level installation folder.

Glossary

authentication
See client authentication.

authentication domain
a SAS internal category that pairs logins with the servers for which they are valid. For example, an Oracle server and the SAS copies of Oracle credentials might all be classified as belonging to an OracleAuth authentication domain.

browser
See Web browser.

client authentication
the process of verifying the identity of a person or process for security purposes.

cluster
a group of computers that participate in load balancing. Each computer in the cluster runs an object spawner that handles client requests for connections.

component
a self-contained, reusable programming object that provides some type of service to other components in an object-oriented programming environment.

connection profile
a client-side definition of where a metadata server is located. The definition includes a computer name and a port number. In addition, the connection profile can also contain user connection information.

credentials
the user ID and password for an account that exists in some authentication provider.

daemon
a process that starts and waits either for a request to perform work or for an occurrence of a particular event. After the daemon receives the request or detects the occurrence, it performs the appropriate action. If nothing else is in its queue, the daemon then returns to its wait state.

data set
See SAS data set.

data warehouse
a collection of data that is extracted from one or more sources for the purpose of query, reporting, and analysis. Data warehouses are generally used for storing large amounts of data that originates in other corporate applications or that is extracted from external data sources.

database management system
a software application that enables you to create and manipulate data that is stored in the form of databases. Short form: DBMS.

database server
a server that provides relational database services to a client. Oracle, DB/2 and Teradata are examples of relational databases.

DBMS
See database management system.

deploy
to install an instance of operational SAS software and related components. The deployment process often includes configuration and testing as well.

domain
a database of users that has been set up by an administrator by using a specific authentication provider such as LDAP or the host operating system. The domain name should be unique within your enterprise. For example, you should not have a Windows domain and a UNIX domain that are both named "SALES".

encryption
the act or process of converting data to a form that is unintelligible except to the intended recipients.

Extensible Markup Language
See XML.

foundation services
See SAS Foundation Services.

identity
See metadata identity.

Integrated Windows authentication
a Microsoft technology that facilitates use of authentication protocols such as Kerberos. In the SAS implementation, all participating components must be in the same Windows domain or in domains that trust each other.

Internet Protocol Version 6
See IPv6.

IPv6
a protocol that specifies the format for network addresses for all computers that are connected to the Internet. This protocol, which is the successor of Internet Protocol Version 4, uses hexadecimal notation to represent 128-bit address spaces. The format can consist of up to eight groups of four hexadecimal characters, delimited by colons, as in FE80:0000:0000:0000:0202:B3FF:FE1E:8329. As an alternative, a group of consecutive zeros could be replaced with two colons, as in FE80::0202:B3FF:FE1E:8329. Short form: IPv6

IWA

See Integrated Windows authentication.

JAR file

a Java Archive file. The JAR file format is used for aggregating many files into one file. JAR files have the file extension .jar.

Java

a set of technologies for creating software programs in both stand-alone environments and networked environments, and for running those programs safely. Java is an Oracle Corporation trademark.

Java Database Connectivity

See JDBC.

Java Development Kit

See JDK.

JDBC

a standard interface for accessing SQL databases. JDBC provides uniform access to a wide range of relational databases. It also provides a common base on which higher-level tools and interfaces can be built. Short form: JDBC.

JDK

a software development environment that is available from Oracle Corporation. The JDK includes a Java Runtime Environment (JRE), a compiler, a debugger, and other tools for developing Java applets and applications. Short form: JDK.

job

a collection of SAS tasks that can create output.

load balancing

for IOM bridge connections, a program that runs in the object spawner and that uses an algorithm to distribute work across object server processes on the same or separate machines in a cluster.

localhost

the keyword that is used to specify the machine on which a program is executing. If a client specifies localhost as the server address, the client connects to a server that runs on the same machine.

login

a SAS copy of information about an external account. Each login includes a user ID and belongs to one SAS user or group. Most logins do not include a password.

metadata identity

a metadata object that represents an individual user or a group of users in a SAS metadata environment. Each individual and group that accesses secured resources on a SAS Metadata Server should have a unique metadata identity within that server.

metadata object

a set of attributes that describe a table, a server, a user, or another resource on a network. The specific attributes that a metadata object includes vary depending on which metadata model is being used.

middle tier
in a SAS business intelligence system, the architectural layer in which Web applications and related services execute. The middle tier receives user requests, applies business logic and business rules, interacts with processing servers and data servers, and returns information to users.

migrate
to populate a new deployment of SAS software with the content, data, or metadata (or a combination of these) from an existing deployment. Migrating might include upgrading to a new software release, converting data or metadata, or other changes to ensure compatibility.

object
an entity that can be manipulated by the commands of a programming language. In object-oriented programming, an object is a compilation of attributes (object elements) and behaviors (methods) that describe an entity. Unlike simple data types that are single pieces of information (e.g. int=10), objects are complex and must be constructed.

object spawner
a program that instantiates object servers that are using an IOM bridge connection. The object spawner listens for incoming client requests for IOM services. When the spawner receives a request from a new client, it launches an instance of an IOM server to fulfill the request. Depending on which incoming TCP/IP port the request was made on, the spawner either invokes the administrator interface or processes a request for a UUID (Universal Unique Identifier).

planned deployment
a method of installing and configuring a SAS business intelligence system. This method requires a deployment plan that contains information about the different hosts that are included in the system and the software and SAS servers that are to be deployed on each host. The deployment plan then serves as input to the SAS Deployment Wizard.

pre-installation checklist
a checklist that enumerates the tasks a customer must perform before installing the business intelligence platform. The primary task is to create a set of operating system user accounts on the metadata server host.

SAS Application Server
a logical entity that represents the SAS server tier, which in turn comprises servers that execute code for particular tasks and metadata objects.

SAS authentication
a form of authentication in which the target SAS server is responsible for requesting or performing the authentication check. SAS servers usually meet this responsibility by asking another component (such as the server's host operating system, an LDAP provider, or the SAS Metadata Server) to perform the check. In a few cases (such as SAS internal authentication to the metadata server), the SAS server performs the check for itself. A configuration in which a SAS server trusts that another component has pre-authenticated users (for example, Web authentication) is not part of SAS authentication.

SAS configuration directory

the location where configuration information for a SAS deployment is stored. The configuration directory contains configuration files, logs, scripts, repository files, and other items for the SAS software that is installed on the machine.

SAS data set

a file whose contents are in one of the native SAS file formats. There are two types of SAS data sets: SAS data files and SAS data views. SAS data files contain data values in addition to descriptor information that is associated with the data. SAS data views contain only the descriptor information plus other information that is required for retrieving data values from other SAS data sets or from files whose contents are in other software vendors' file formats.

SAS Deployment Manager

a cross-platform utility that manages SAS deployments. The SAS Deployment Manager supports functions such as updating passwords for your SAS deployment, rebuilding SAS Web applications, and removing configurations.

SAS Deployment Wizard

a cross-platform utility that installs and initially configures many SAS products. Using a SAS installation data file and, when appropriate, a deployment plan for its initial input, the wizard prompts the customer for other necessary input at the start of the session, so that there is no need to monitor the entire deployment.

SAS Foundation Services

a set of core infrastructure services that programmers can use in developing distributed applications that are integrated with the SAS platform. These services provide basic underlying functions that are common to many applications. These functions include making client connections to SAS application servers, dynamic service discovery, user authentication, profile management, session context management, metadata and content repository access, activity logging, event management, information publishing, and stored process execution.

SAS installation data file

See SID file.

SAS installation directory

the location where your SAS software is installed. This location is the parent directory to the installation directories of all SAS products. The SAS installation directory is also referred to as SAS Home in the SAS Deployment Wizard.

SAS IOM workspace

in the IOM object hierarchy for a SAS Workspace Server, an object that represents a single session in SAS.

SAS Management Console

a Java application that provides a single user interface for performing SAS administrative tasks.

SAS Metadata Server

a multi-user server that enables users to read metadata from or write metadata to one or more SAS Metadata Repositories.

SAS OLAP Server

a SAS server that provides access to multidimensional data. The data is queried using the multidimensional expressions (MDX) language.

SAS Pooled Workspace Server

a SAS Workspace Server that is configured to use server-side pooling. In this configuration, the SAS object spawner maintains a collection of workspace server processes that are available for clients.

SAS Software Depot

a file system that consists of a collection of SAS installation files that represents one or more orders. The 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 depot contains the SAS Deployment Wizard executable, one or more deployment plans, a SAS installation data file, order data, and product data.

SAS Stored Process Server

a SAS IOM server that is launched in order to fulfill client requests for SAS Stored Processes.

SAS Workspace Server

a SAS IOM server that is launched in order to fulfill client requests for IOM workspaces.

SAS/CONNECT server

a server that provides SAS/CONNECT services to a client. When SAS Data Integration Studio generates code for a job, it uses SAS/CONNECT software to submit code to remote computers. SAS Data Integration Studio can also use SAS/CONNECT software for interactive access to remote libraries.

SAS/SHARE server

the result of an execution of the SERVER procedure, which is part of SAS/SHARE software. A server runs in a separate SAS session that services users' SAS sessions by controlling and executing input and output requests to one or more SAS libraries.

SASHOME directory

the file location where an instance of SAS software is installed on a computer. The location of the SASHOME directory is established at the initial installation of SAS software by the SAS Deployment Wizard. That location becomes the default installation location for any other SAS software you install on the same machine.

server context

a SAS IOM server concept that describes how SAS Application Servers manage client requests. A SAS Application Server has an awareness (or context) of how it is being used and makes decisions based on that awareness. For example, when a SAS Data Integration Studio client submits code to its SAS Application Server, the server determines what type of code is submitted and directs it to the correct physical server for processing (in this case, a SAS Workspace Server).

service

one or more application components that an authorized user or application can call at any time to provide results that conform to a published specification. For example, network services transmit data or provide conversion of data in a network, database services provide for the storage and retrieval of data in a database, and Web services interact with each other on the World Wide Web.

servlet

a Java program that runs on a Web server. Servlets are a complementary technology to applets, which run in Web browsers. Unlike applet code, servlet code does not have to be downloaded to a Web browser. Instead, servlets send HTML or other

appropriate content back to a browser or to another type of Web-based client application.

servlet container
the component of a Web server that manages the lifecycle of servlets, mapping a URL to a particular servlet and ensuring that the URL requester has the correct access rights. All servlet containers must support HTTP as a protocol for requests and responses, but they can also support additional protocols such as HTTPS.

SID file
a control file containing license information that is required in order to install SAS.

single sign-on
an authentication model that enables users to access a variety of computing resources without being repeatedly prompted for their user IDs and passwords. For example, single sign-on can enable a user to access SAS servers that run on different platforms without interactively providing the user's ID and password for each platform. Single sign-on can also enable someone who is using one application to launch other applications based on the authentication that was performed when the user initially logged on.

software order e-mail (SOE)
an e-mail message that is sent to your site that announces the availability of the software and details the order. It also lists the initial installation steps and, for SAS 9.3, contains instructions for using Electronic Software Delivery (ESD), if applicable.

spawner
See object spawner.

SSO
See single sign-on.

trusted user
a privileged service account that can act on behalf of other users on a connection to the metadata server.

unrestricted identity
a user or group that has all capabilities and permissions in the metadata environment due to membership in the META: Unrestricted Users Role (or listing in the adminUsers.txt file with a preceding asterisk).

update mode
an operating state of the SAS Deployment Wizard in which users are required to install software updates before they can perform any other deployment tasks. The SAS Deployment Wizard automatically goes into update mode when it determines that the current SAS order contains new versions or maintenance updates to the deployed products in a given SAS installation directory.

warehouse
See data warehouse.

Web application
an application that is accessed via a Web browser over a network such as the Internet or an intranet. SAS Web applications are Java Enterprise Edition (JEE) applications

that are delivered via Web application archive (WAR) files. The applications can depend on Java and non-Java Web technologies.

Web authentication

a configuration in which users of Web applications and Web services are verified at the Web perimeter and the metadata server trusts that verification.

Web browser

a software application that is used to view Web content, and also to download or upload information. The browser submits URL (Uniform Resource Locator) requests to a Web server and then translates the HTML code into a visual display.

Web-distributed authoring and versioning

a set of extensions to the HTTP protocol that enables users to collaboratively edit and manage files on remote Web servers. Short form: WebDAV.

WebDAV

See Web-distributed authoring and versioning.

WebDAV server

an HTTP server that supports the collaborative authoring of documents that are located on the server. The server supports the locking of documents, so that multiple authors cannot make changes to a document at the same time. It also associates metadata with documents in order to facilitate searching. The SAS business intelligence applications use this type of server primarily as a report repository. Common WebDAV servers include the Apache HTTP Server (with its WebDAV modules enabled), Xythos Software's WebFile Server, and Microsoft Corporation's Internet Information Server (IIS).

workspace

See SAS IOM workspace.

XML

a markup language that structures information by tagging it for content, meaning, or use. Structured information contains both content (for example, words or numbers) and an indication of what role the content plays. For example, content in a section heading has a different meaning from content in a database table. Short form: XML.

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