# Contents

**Using This Book** ................................................................. v  
**What's New in Migration for the SAS 9.4 Intelligence Platform** .................... vii  

## Chapter 1 • Introduction ........................................................................... 1  
Approaches for Upgrading to SAS 9.4 ......................................................... 2  
What is Promotion? ........................................................................ 2  
Promotion Tools ............................................................................ 2  
What Can Be Promoted? ................................................................. 3  
Special Considerations for Promoting Content to SAS 9.4 from an Earlier SAS Version ................................................................. 3  
What is Migration? ........................................................................ 5  
Comparing Promotion and Migration ....................................................... 6  
Migration Tools ............................................................................ 6  
What Can Be Migrated? ................................................................. 7  
High-Level SAS Migration Requirements ............................................... 8  
Choosing an Approach for Upgrading to SAS 9.4 .......................................... 9  
What Is Covered in This Document? .................................................... 10  
Running SAS 9.1.3 ........................................................................ 10  
Migrating to SAS Enterprise Miner ......................................................... 10  
Migrating to SAS Model Manager ......................................................... 10  
Migrating SAS Solutions ................................................................ 10  
Migrating SAS Content to SAS 9.4 ......................................................... 11  

## Chapter 2 • Designing Your Migration .......................................................... 13  
Overview of Designing Your Migration .................................................... 14  
Review High-Level SAS Migration Requirements ...................................... 15  
Assess Your Hardware and Third-Party Software ........................................ 16  
Memory Requirement on z/OS ................................................................. 16  
Change to SAS 9.2 Internal Account Password Hashing .................................. 16  
Avoiding Path Conflicts with the SAS Application Server Configuration .......... 17  
Location for the SAS Content Server Repository ....................................... 17  
SAS Data Management Server Consideration .......................................... 17  
Prohibition on SASMeta Server Components .......................................... 18  
Inventorying Your Current SAS Deployment ........................................... 18  
Middle-Tier Considerations ................................................................. 31  
Obtain a Valid SAS 9.4 Deployment Plan ............................................. 33  
Schedule User Downtime ..................................................................... 33  

## Chapter 3 • Performing Pre-migration Tasks ................................................ 35  
Overview of Performing Pre-migration Tasks ............................................ 35  
Back Up Your Current SAS System ......................................................... 38  
Apply Any Required SAS Maintenance ................................................... 38  
Completing the Pre-migration Checklists .................................................... 39  
Installing Third-Party Software ............................................................. 45  
Creating SAS Software Depots ............................................................... 47  
Create the Migration Package ............................................................... 63  

## Chapter 4 • Installing SAS 9.4 and Migrating Your SAS Content .................. 69  
Overview of Installing SAS and Migrating Your Content ............................. 69
### Contents

Preparing to Install and to Configure ........................................ 70
Install and Migrate SAS Interactively ........................................ 75
Automating SAS 9.4 Client Installation across Multiple Machines .......... 103

**Chapter 5 • Performing Post-migration Tasks** .................................. 105
Overview of Performing Post-migration Tasks .................................... 106
Install Hot Fixes ........................................................................... 106
Review SAS Deployment Wizard Documents, Reports, and Logs ................. 106
Metadata Server Tier Post-migration Tasks ........................................ 108
Server Tier Post-migration Tasks ................................................... 108
Middle-Tier Post-migration Tasks ................................................... 114

**Chapter 6 • Validating Your SAS Migrated Deployment** ....................... 119
Validating Your SAS Migrated Deployment ......................................... 119

**Chapter 7 • What to Do Next: Administration Tasks** .......................... 121
Overview of Administration Tasks .................................................. 121
First-Priority Setup Tasks ................................................................ 122
Standard Setup Tasks ..................................................................... 127
Optional Setup Tasks ..................................................................... 128
Ongoing System Administration Tasks .............................................. 130
Best Practices for Ensuring the Integrity of Your System ......................... 131

**Appendix 1 • SAS Migration Utility Reference** .................................. 135
SAS Migration Utility Overview ...................................................... 135
Which Version of the Migration Utility Do I Use? ................................ 136
smu Command Syntax .................................................................. 136
smu Command Syntax Description .................................................. 137
smu Command Notes .................................................................... 141
smu Command Examples ............................................................... 142
Running the Migration Utility Using a Properties File ............................ 146

**Appendix 2 • Product-Specific SAS Migration Utility Properties** .......... 153
Product-Specific SAS Migration Utility Properties Overview ................... 153
SAS Analytics Platform Properties .................................................. 154
SAS Content Server Properties ....................................................... 154
SAS Contextual Analysis Properties ................................................ 156
SAS Grid Control Server Properties ............................................... 157
SAS IT Resource Management Properties ....................................... 157
SAS Model Manager Properties ...................................................... 158
SAS Shared Services - SAS Web Infrastructure Platform Database Properties .......... 161
SAS Visual Analytics Properties ..................................................... 164
SAS Web Report Studio Properties ............................................... 166

**Recommended Reading** ............................................................... 167
**Glossary** .................................................................................. 169
**Index** ..................................................................................... 175
Using This Book

Audience

The information in this document can be used by a SAS system administrator to migrate SAS Intelligence Platform to SAS Intelligence Platform 9.4 on one or more machines.

Documentation Conventions

**SAS Installation Directory**

The phrase *SAS installation directory* refers to a host path. (The SAS installation directory is sometimes referred to as SAS Home.) For example, `C:\Program Files\SASHome`.

**SAS Configuration Directory**

The phrase *SAS configuration directory* refers to a host path that includes a configuration name and level. For example, `C:\SAS\Config\Lev1`.

For more information, see the topic, “Overview of the Configuration Directory Structure,” in the *SAS Intelligence Platform: System Administration Guide*.

**Style Conventions for SAS Migration Utility Syntax**

The style conventions that are used in documenting SAS Migration Utility syntax include bold and italic:

- **Bold** identifies SAS Migration Utility keywords such as the names of arguments.
  In this example, the keyword `-sasconfigdir` is written in bold:
  
  `-sasconfigdir path`

- **Italic** identifies arguments or values that you supply.
  In this example, you provide a path to the properties file:
  
  `-properties pathname`
**Special Characters for SAS Migration Utility Syntax**

Special characters that are used in SAS Migration Utility syntax denote the following:

--

Two hyphens are required by the migration utility when running on UNIX and z/OS.

Two hyphens (--) without any space between them are placed immediately after the SAS Migration Utility command.

In this example, the user is migrating from SAS 9.3 on UNIX:

```bash
./smu93 -- -sasconfigdir /opt/SAS/config/Lev1
-sasproductdir /opt/SASHome -profile md1234
-outputdir "/home/sas/smu_packages" -tier server_tier
-replace -analyze
```

One hyphen is required before each option.

In this example, the user is migrating from SAS 9.3 on a 32-bit Windows system:

```bash
smu93_32 -profile md1234 -sasconfigdir C:\SAS\BIServer\Lev1
-sasproductdir "C:\Program Files\SASHome"
-outputdir "C:\SMU_packages" -tier server_tier -replace
```

Double quotation marks are used to enclose any paths containing spaces.

In this example, `-sasexedir` identifies the path to the SAS executable on Windows:

```bash
-sasexedir "C:\Program Files\SASHome\SASFoundation\9.4"
```

*Note:* A backslash immediately followed by a double quotation marks ("\") is not allowed in the migration utility command line. Avoid ending Windows paths with a trailing backslash on the command line. (This limitation does not apply to migration utility property files.)

| A vertical bar in syntax diagrams indicates that you can choose one value from a group of values. Values that are separated by the vertical bar are mutually exclusive.

In this example, you can choose to run only one version of the SAS Migration Utility:

```bash
smu92 -- | smu93 -- | smu94 --
```

*<>* Angle brackets in syntax diagrams identify optional arguments. A required argument is not enclosed in angle brackets. In this example, `-metadatabase host-name` is required and its port is optional:

```bash
-metadatabase host-name <metadaport port>
```
What's New in Migration for the SAS 9.4 Intelligence Platform

Overview

The SAS 9.4 Intelligence Platform: Migration Guide describes the migration approach for upgrading your SAS Intelligence Platform 9.2 or 9.3 content and configuration to SAS 9.4. It describes the various phases of design, execution, and validation of your migration using the SAS migration tools.

Changes in the May 2019 release of SAS 9.4M6 regarding migration include the following:

- A new SAS Content Server migration utility property, SMU.scs.tempdir, has been added. See “SAS Content Server Properties” on page 154.
- New information about which version of the SAS Migration Utility you should use has been added. See “Which Version of the Migration Utility Do I Use?” on page 136.

Changes in SAS 9.4M4 regarding migration include the following:

- new migration utility property for SAS Content Server

Changes in SAS 9.4M3 regarding migration include the following:

- enhanced password management in the migration utility

Changes in SAS 9.4M2 regarding migration include the following:

- new migration utility properties for SAS Contextual Analysis
- enhanced migration analysis report
- copying of server usermod files

Changes in 9.4 M1 regarding migration include the following:

- addition of version analysis to the migration utility analysis report

Changes in SAS 9.4 regarding migration include the following:

- MSI-based packages for SAS Enterprise Guide and SAS Add-In for Microsoft Office
- support for certificate-based communication
- SAS Deployment Agent
- new web application server
- support for metadata server clustering
- Locale Setup Manager task
- new migration utility properties for SAS Content Server
• new migration utility properties for SAS Model Manager
• new migration utility properties for SAS Visual Analytics

New Migration Utility Property for SAS Content Server

In SAS 9.4M4, a new migration utility property enables you to increase the Java heap size for the SAS Content Server repository.

For more information, see Table A2.3 on page 155.

Enhanced Password Management in the Migration Utility

In SAS 9.4M3, password protection enhancements have been added to the SAS Migration Utility.

For more information, see “How the Migration Utility Manages Passwords” on page 146.

New Migration Utility Properties for SAS Contextual Analysis

In SAS 9.4M2, there are two new unique properties for SAS Contextual Analysis that the SAS Migration Utility uses when creating a migration analysis report, or later in the process when the utility builds a migration package.

For more information, see “SAS Contextual Analysis Properties” on page 156.

Enhanced Migration Analysis Report

In SAS 9.4M2, a hyperlink and lines to delineate the migration matrix have been added to the migration analysis report. For more information, see Figure 2.3 on page 26.

Copying of Server Usermod Files

In SAS 9.4M2, the SAS Migration Utility makes a copy of your server user modification files. For more information, see “Update SAS Server Configuration Files” on page 110.
Addition of Version Analysis to the Migration Utility Analysis Report

In the 9.4 M1, a new feature has been added that identifies those versions of SAS offerings that cannot be directly migrated to SAS 9.4 with the SAS Migration Utility. This information lets you know which products to update in order to prepare them for migration.

For more information, see “View and Analyze Your Migration Analysis Report” on page 29.

MSI-Based Packages for SAS Enterprise Guide and SAS Add-In for Microsoft Office

In SAS 9.4, there is another installation option for SAS Enterprise Guide and SAS Add-In for Microsoft Office. This additional option consists of packages based on Microsoft Installer (MSI) that are much smaller in size than the SAS Software Depot. These MSI-based packages enable administrators to install these two SAS products over a distributed deployment using software provisioning tools such as Microsoft System Center Configuration Manager (SCCM). This new installation option is available only on Windows.


Support for Certificate-Based Communication

In SAS 9.4, the SAS Deployment Wizard prompts for Transport Security Layer, certificate-based communication. For more information, refer to SAS Intelligence Platform: Middle-Tier Administration Guide.

SAS Deployment Agent

The SAS Deployment Agent is required for deployments that run remote processes. SAS uses the agent to copy content and to perform configuration management operations associated with creating new servers and clustering. It is also used for server administration tasks such as deployment backups. For more information, see “SAS Deployment Agents” in SAS Intelligence Platform: Installation and Configuration Guide.
**New Web Application Server**

In SAS 9.4, support for third-party web application servers has been replaced by the SAS Web Application Server. For more information, see “New SAS Web Application Server in SAS 9.4” on page 32.

**Support for Metadata Server Clustering**

SAS 9.4 supports clustering of SAS Metadata Servers. This feature provides redundancy and high availability of the metadata server, which is a core component of the SAS infrastructure. Clustering ensures that the server will continue to operate if a server host machine fails. You can implement clustering during deployment or at a later time. For more information, see “Metadata Server Clustering” on page 71.

**Locale Setup Manager Task**

On Windows and UNIX machines, you can use the Locale Setup Manager task in the SAS Deployment Manager to configure the language and region for SAS Foundation and certain SAS applications. For more information, see “Change Locale for SAS” in *SAS Intelligence Platform: Installation and Configuration Guide*.

**New Migration Utility Properties for SAS Content Server**

There are two new unique properties for SAS Content Server that the SAS Migration Utility uses when creating a migration analysis report, or later in the process when the utility builds a migration package.

For more information, see “SAS Content Server Properties” on page 154.

**New Migration Utility Properties for SAS Model Manager**

There are six new unique properties for SAS Model Manager that the SAS Migration Utility uses when creating a migration analysis report, or later in the process when the utility builds a migration package.

For more information, see “SAS Model Manager Properties” on page 158.
New Migration Utility Properties for SAS Visual Analytics

There are four new unique properties for SAS Visual Analytics that the SAS Migration Utility uses when creating a migration analysis report, or later in the process when the utility builds a migration package.

For more information, see “SAS Visual Analytics Properties” on page 164.
Migration
# Chapter 1

## Introduction

- Approaches for Upgrading to SAS 9.4 ........................................ 2
- What is Promotion? ................................................................. 2
- Promotion Tools ................................................................. 2
- What Can Be Promoted? ....................................................... 3
- Special Considerations for Promoting Content to SAS 9.4 from an Earlier SAS Version ............................................. 3
  - About Promoting Content to SAS 9.4 from an Earlier SAS Version .............................................. 3
  - Promoting Personal Folders from SAS 9.2 to SAS 9.4 ......................................................... 4
  - Restriction on Specifying Locations for SAS 9.2 Folders in a SAS 9.4 Custom Repository ....................... 5
  - Promoting Dashboard Objects from SAS 9.2 or SAS 9.3 to SAS 9.4 .............................................. 5
  - Promoting Portal Content from SAS 9.2 or SAS 9.3 to SAS 9.4 ............................................... 5
- What is Migration? ................................................................. 5
- Comparing Promotion and Migration ..................................... 6
- Migration Tools ................................................................. 6
- What Can Be Migrated? ......................................................... 7
- High-Level SAS Migration Requirements ................................. 8
- Choosing an Approach for Upgrading to SAS 9.4 .................... 9
- What Is Covered in This Document? ..................................... 10
- Running SAS 9.1.3 .............................................................. 10
- Migrating to SAS Enterprise Miner ..................................... 10
- Migrating to SAS Model Manager ........................................ 10
- Migrating SAS Solutions ..................................................... 10
- Migrating SAS Content to SAS 9.4 ........................................ 11
  - A High-Level View of Migration .............................................. 11
  - Step 1: Design Your Migration .................................................. 11
  - Step 2: Perform Pre-migration Tasks ........................................... 11
  - Step 3: Install SAS 9.4 and Migrate Your SAS Content ......................... 12
  - Step 4: Perform Post-migration Tasks ........................................... 12
  - Step 5: Validate Your Migration .................................................. 12
Approaches for Upgrading to SAS 9.4

You have several approaches for upgrading to SAS 9.4. You can do one of the following:

• Promote—install SAS 9.4 and upgrade portions of your current SAS content.
• Migrate—install SAS 9.4 and upgrade all your current SAS content.
• Use a combination of migration and promotion.

The terms “promotion” and “migration” are explained in the following sections. This subject is discussed in more depth in “Choosing an Approach for Upgrading to SAS 9.4” on page 9.

What is Promotion?

Promotion is the movement of selected content from a source system to an already configured target system. Sometimes called “partial promotion,” promotion of metadata content is typically used to support movement across development, test, and production environments.

Promotion capabilities in SAS 9.4 are embedded within the SAS folder structure. The ability of SAS 9.4 to import earlier versions of SAS content means that partial promotion can be leveraged as part of a strategy for upgrading content from earlier versions of SAS to SAS 9.4.

Some important enhancements have been made to support promotion in SAS 9.4. These enhancements include the ability to do the following:

• promote more types of metadata objects
• target particular metadata objects to promote incremental changes
• schedule batch promotions

Promotion supports the following:

• movement of selected content
• cross-platform movement of content

Promotion does not support the following:

• some types of SAS content
• configuration (either in metadata or in files)

Promotion Tools

Partial promotion can be used as one manner in which to upgrade one’s content to a later version of SAS. The Export SAS Package, Import SAS Package wizards, and batch tools support partial promotion. For more information, see
What Can Be Promoted?

The following list enumerates the type of SAS content that you can migrate using the promotion tools. (In SAS 9.4, a larger number of object types can be imported and exported.)

- cubes
- documents
- external files
- folders
- generated transformations
- information maps
- job flows
- jobs
- libraries
- mining results
- notes
- reports
- scheduled jobs
- stored processes
- tables
- portal content

For more information, see “Promoting Portal Content” in SAS Intelligence Platform: Web Application Administration Guide.

Special Considerations for Promoting Content to SAS 9.4 from an Earlier SAS Version

About Promoting Content to SAS 9.4 from an Earlier SAS Version

You can export a package from a SAS 9.2 or SAS 9.3 metadata server and import it to a SAS 9.4 metadata server. This capability is useful in the following situations:

- You are upgrading from SAS 9.2 or SAS 9.3 to SAS 9.4, but you chose not to use the SAS Migration Utility.
- You are running SAS 9.4 in parallel with SAS 9.2 or SAS 9.3, and you want to update your SAS 9.4 system with new content that you created in the earlier release.

The following information is important when you promote content to SAS 9.4 from an earlier version.

- the need to correctly promote personal folders from SAS 9.2 to SAS 9.4
special considerations for promoting folders, dashboard objects, and portal content from SAS 9.2 to SAS 9.4

Note: If you need to promote content to support an upgrade from SAS 9.1.3 to SAS 9.4, then please contact SAS Technical Support for more information, and visit the SAS Migration Utility Focus Area at http://support.sas.com/rnd/migration/utility/index.html.

Promoting Personal Folders from SAS 9.2 to SAS 9.4

Options for Correctly Promoting Personal Folders from SAS 9.2
In SAS 9.2, users’ personal folders are located by default under a parent folder called Users. The name of this folder in your SAS 9.4 deployment depends on which approach you use to upgrade:

• If you upgrade using the SAS Migration Utility, then the name of the folder (Users) is retained in SAS 9.4. You can promote users’ personal folders along with your other content without the need for additional steps.

• If you choose not to use the SAS Migration Utility, then your SAS 9.4 deployment contains the new default name for the parent folder, which is User Folders. In this situation, you must use one of the approaches described in this section to correctly promote the content of your personal folders.

CAUTION:
If you do not use the SAS Migration Utility to upgrade from SAS 9.2 to SAS 9.4, be sure to follow the instructions in this section to ensure that your users’ personal folders will work properly after promotion.

You can use either of the following approaches to correctly promote your users’ personal folders:

• “Option 1: Promote Personal Folders to the New Location in SAS 9.4”

• “Option 2: Configure SAS 9.4 to Recognize the “Users” Folder Name, and Promote the Existing Folder”

Option 1: Promote Personal Folders to the New Location in SAS 9.4
You can promote users’ personal folders from SAS 9.2 to the new location (User Folders) in SAS 9.4. To do so, you must promote the personal folders separately from other metadata. In addition, you must promote the personal folders without promoting the Users folder itself. Follow these steps:

1. Use SAS Management Console to connect to the SAS 9.2 metadata server, and select the Users node in the SAS Folders tree.

2. In the right pane, select all of the personal folders that you want to export. (Press CTRL to enable the selection of multiple items.) Then right-click the mouse, select Export SAS Package, and complete the export.

3. Use SAS Management Console to connect to the SAS 9.4 metadata server. Select the User Folders node in the SAS Folders tree, and import the package.

Option 2: Configure SAS 9.4 to Recognize the “Users” Folder Name, and Promote the Existing Folder
If you do not want to switch to the new folder name (User Folders) for personal folders, you can reconfigure SAS to use the previous folder name (Users). For instructions, contact SAS Technical Support.
Restriction on Specifying Locations for SAS 9.2 Folders in a SAS 9.4 Custom Repository

In SAS 9.3 and SAS 9.4, the import wizard and the batch import tool enable you to reorganize content as part of the promotion process. You can do so by specifying new folder locations for individual objects or folders that you are importing.

When you are importing SAS 9.2 content to a custom repository, you cannot use this feature to change the location of a folder. However, you can use the feature to change the location of individual objects in the custom repository.

Promoting Dashboard Objects from SAS 9.2 or SAS 9.3 to SAS 9.4

Dashboard objects (including dashboards, indicators, indicator data, ranges, indicator configurations, and dashboard components) can be promoted from a SAS 9.3 (SAS BI Dashboard 4.31) deployment to a SAS 9.4 (SAS BI Dashboard 4.4) deployment.

However, these object types cannot be promoted from a SAS 9.2 (SAS BI Dashboard 4.3) deployment to a SAS 9.4 (SAS BI Dashboard 4.4) deployment. You must use the SAS Migration Utility instead.

Promoting Portal Content from SAS 9.2 or SAS 9.3 to SAS 9.4


What is Migration?

Migration is a process in which your SAS content and configuration from an earlier SAS release is upgraded to run in a later SAS release. When performed successfully, migration attempts to preserve as much of your current content and configuration as possible, reduce the number of manual migration tasks, and minimize system downtime.

You can migrate with the SAS automated migration tools in the following scenarios:

- SAS 9.2 to SAS 9.4
- SAS 9.3 to SAS 9.4
- SAS 9.4 to SAS 9.4

For more information about the use cases for SAS 9.4 to SAS 9.4 migration, see “About Using the SAS Migration Utility to Copy an Existing Deployment” in SAS Intelligence Platform: System Administration Guide.

See also the Migration Focus Area, available at http://support.sas.com/rnd/migration/utility/index.html.
Comparing Promotion and Migration

The following table summarizes the differences between promotion and migration:

Table 1.1 Migration and Promotion Comparison

<table>
<thead>
<tr>
<th>Migration</th>
<th>Promotion</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is acted on?</td>
<td>A SAS system</td>
</tr>
<tr>
<td></td>
<td>(content and configuration)</td>
</tr>
<tr>
<td></td>
<td>Selected SAS content</td>
</tr>
<tr>
<td></td>
<td>(content only)</td>
</tr>
<tr>
<td>When is it performed?</td>
<td>During SAS 9.4 deployment</td>
</tr>
<tr>
<td></td>
<td>One time only</td>
</tr>
<tr>
<td></td>
<td>After SAS 9.4 deployment</td>
</tr>
<tr>
<td></td>
<td>Repeatable</td>
</tr>
<tr>
<td>Topology constraints</td>
<td>Same logical machine grouping*</td>
</tr>
<tr>
<td></td>
<td>No constraints</td>
</tr>
<tr>
<td>Platform constraints</td>
<td>Same operating system family**</td>
</tr>
<tr>
<td></td>
<td>No constraints</td>
</tr>
<tr>
<td>SAS versions supported</td>
<td>SAS 9.2 and later</td>
</tr>
<tr>
<td></td>
<td>SAS 9.2 and later</td>
</tr>
</tbody>
</table>

* For more information, see “the same topology.” on page 8.
** The SAS automated migration tools support migrating within families of operating systems. You can migrate within the Windows family (for example, Windows 32-bit to Windows 64-bit) or migrate within the UNIX family (for example, Solaris to HP-UX or AIX to RH Linux).

Migration Tools

SAS provides tools to automate most of the tasks necessary to migrate to SAS 9.4. These tools are:

- SAS Migration Utility
- SAS Deployment Wizard

The SAS Migration Utility is a cross-platform framework and set of SAS product extensions whose primary purpose is to create a package of content from an existing SAS configuration. The SAS Deployment Wizard uses the package of content, called a migration package, when it installs and configures SAS 9.4.

The SAS Deployment Wizard is a cross-platform utility that installs and initially configures SAS 9.4 products. Using a SAS installation data file and a deployment plan for its initial input, the wizard is designed to prompt the customer for all the remaining input at the start of the session so that the customer does not have to monitor an entire deployment. During a migration, the wizard reads the migration package created by the SAS Migration Utility and upgrades SAS content and configuration to run in SAS 9.4.
What Can Be Migrated?

The SAS automated migration tools migrate the following content and configuration from an existing SAS configuration that reside under the SAS configuration directory:

- content stored in metadata
  (such as libraries, reports, jobs, information maps, data explorations, and so on)
- content in the WebDAV repository
  (such as report definitions and documents)
- configuration stored in metadata
  (such as for servers, users, groups, ACTs, and so on)
- certain server configuration files
  (such as adminusers.txt and trustedusers.txt)
- usermods files for servers configured through the SAS Deployment Wizard
  The migration utility creates a **sourceusermods** folder in the configuration directory on the target system that contains all the usermods files from the source configuration directory. For more information, see “Update SAS Server Configuration Files” on page 110.
- web application configuration
  (such as deployment properties and configuration files)

The SAS automated migration tools do **not** migrate the following SAS content and configuration:

- Transport Layer Security (TLS) configurations
  Any configuration of TLS (also known as SSL) made to your SAS system is not migrated. After you migrate your SAS system, you have to reconfigure TLS.
  For more information, see “Configure SAS Web Server Manually for HTTPS” in *SAS Intelligence Platform: Middle-Tier Administration Guide* and “Configure SAS Web Application Server for HTTPS” in *SAS Intelligence Platform: Middle-Tier Administration Guide*.
- certain SAS Application Server configuration files
  autoexec files (appserver_autoexec.sas) and sasv9.cfg files are not migrated. Usermod files are not migrated for servers that are created with SAS Management Console or by means other than the SAS Deployment Wizard. For more information, see “Update SAS Server Configuration Files” on page 110.
- SAS middle-tier configuration information
  For more information, see “Review the SAS Middle-Tier Configuration” on page 115.
- custom portlet code
- custom metadata
A custom metadata definition is a metadata definition that you create using the SAS Open Metadata Interface, SAS Java Metadata Interface, or SAS metadata DATA step functions. (Custom metadata is not created when using SAS Management Console wizards and wizards provided by other SAS platform products and solutions.)

High-Level SAS Migration Requirements

Using the SAS automated migration tools, migrating requires the following:

specific versions of SAS.

The SAS automated migration tools support migration for the following versions of SAS:

- SAS 9.2 to SAS 9.4.
  
  Note: There might be additional product-specific requirements for migration.

- SAS 9.3 to SAS 9.4.
  
  Note: There might be additional product-specific requirements for migration.

- SAS 9.4 to SAS 9.4.

  For more information about the use cases for SAS 9.4 to SAS 9.4 migration, see “About Using the SAS Migration Utility to Copy an Existing Deployment” in SAS Intelligence Platform: System Administration Guide.

For additional information about specific SAS offerings, refer to http://support.sas.com/migration/utilitynotes.

Later in this document, you will be instructed to create a migration analysis report for each tier of your SAS deployment. One purpose of this report is to help you identify those SAS components that must be upgraded before you can migrate to SAS 9.4. For more information, see “Inventorying Your Current SAS Deployment” on page 18.

full system migration all at the same time.

All your content and configuration from your earlier SAS version is migrated to SAS 9.4 at the same time.

the same topology.

Your SAS architecture must continue to be distributed across logical machines in the same fashion. Because a logical machine corresponds to a single SAS configuration directory, this directory can be relocated to a different physical machine during migration.

Redistributing logical machines on different physical machines increases the level of complexity for your migration. Common issues involve port conflicts and physical files residing outside of the configuration directory tree. Understand this complexity and plan for it when designing your migration.

Note: You can add new SAS 9.4 products during a migration. Make sure the new product components are contained in your SAS order and deployment plan file.

the same middle tier.

When you migrate to SAS 9.4, the SAS Deployment Wizard replaces your current web application server with SAS Web Application Server.
the same operating system family.

Your SAS 9.4 components must run on the same operating system family as they did in your earlier SAS version.

You can migrate within the Windows family (for example, Windows 32-bit to Windows 64-bit) or migrate within the UNIX family (for example, Solaris to HP-UX or AIX to RH Linux).


For more information about post-migration tasks when migrating from one version of an operating system to another, see “Overview of Performing Post-migration Tasks” on page 106.

Note: On UNIX, SAS 9.4 should be installed on a file system that supports large files. (Files that are greater than 2GB in size.)

---

Choosing an Approach for Upgrading to SAS 9.4

You should review your goals for upgrading and develop an upgrade plan that best fits your enterprise environment. Selecting the approach might require trade-offs. You will have to balance the benefits and challenges of the upgrade options with your goals and priorities. There are several approaches for upgrading to SAS 9.4:

- **Promote**—install SAS 9.4 and upgrade *portions* of your current SAS content.
  - The Export and Import SAS Package wizards or batch tools provide you with a great deal of flexibility. Promotion enables you to move gradually to SAS 9.4 if you have additional hardware on which to run SAS 9.4 separate from earlier SAS versions. Consider using promotion to upgrade to SAS 9.4 in the following cases:
    - You want to change your SAS topology or operating systems.
    - You have made minimal configuration changes to your earlier SAS deployment.
    - You want to move only selected content from your earlier SAS version.

- **Migrate**—install SAS 9.4 and upgrade *all* your current SAS content.
  - Using the SAS Migration Utility with the SAS Deployment Wizard to migrate to SAS 9.4 has some definite advantages, as you will achieve the most automation as possible using this method. Consider using migration to upgrade to SAS 9.4 in the following cases:
    - You want to retain your SAS topology.
    - You have made significant configuration changes to your earlier SAS deployment (such as customizations to users and groups, ACTs, or server configurations).
    - You want to move all content from your earlier SAS version.

- **Use a combination of migration and promotion.**

  Migration and promotion are not mutually exclusive. You might choose to migrate to a 9.4 deployment and run it in parallel with your earlier SAS version and periodically refresh the 9.4 content through partial promotion. This enables you to continue to use
your earlier SAS version in production while you validate your migrated SAS content and become familiar with the new features of SAS 9.4.

What Is Covered in This Document?

This document describes the migration approach for upgrading your earlier SAS content and configuration to SAS 9.4. It describes the various phases of design, execution, and validation of your migration using the SAS migration tools.

For more information about promotion, see “Promotion Tools Overview” in SAS Intelligence Platform: System Administration Guide.

For more information about same-version migration, see “Performing SAS 9.4 to SAS 9.4 Migration” in SAS Intelligence Platform: System Administration Guide.

Running SAS 9.1.3

If your site is running SAS 9.1.3, then please contact SAS Technical Support for more information, and visit the SAS Migration Utility Focus Area at http://support.sas.com/rnd/migration/utility/index.html.

Migrating to SAS Enterprise Miner

If you are migrating to SAS Enterprise Miner, then you should also consult SAS Enterprise Miner: Administration and Configuration.

Migrating to SAS Model Manager

If you are migrating to SAS Model Manager, then you should also consult the SAS Model Manager Migration Guide.

Migrating SAS Solutions

As a part of the migration design step, consult the migration documents specific to any SAS solutions that you are running. The following list is a sampling of some of the migration documents available. For a complete listing, consult the SAS Central Document Library at http://support.sas.com/cdsearch?ct=80000:

- SAS IT Resource Management: Migration Guide
**Migrating SAS Content to SAS 9.4**

**A High-Level View of Migration**

The following list summarizes the steps required to install SAS 9.4 and migrate earlier SAS version content on a single machine or in a distributed, heterogeneous environment:

1. Design your migration.
2. Perform pre-migration tasks.
3. Install SAS 9.4 and migrate your content from an earlier SAS version.
4. Perform post-migration tasks.
5. Validate your migration.

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

For SAS solutions, see the product's documentation for additional information about migration and promotion.

**Step 1: Design Your Migration**

Designing your migration means reviewing the SAS 9.4 requirements (hardware, software, and migration) against your current SAS deployment, and developing a plan for how to get your SAS content—your data and configuration—integrated into a SAS 9.4 system.

One of the migration tools that SAS provides, the SAS Migration Utility, generates a migration analysis report. Using this report, you can analyze every machine in your current SAS deployment to answer these crucial design questions:

- Which SAS products currently reside on each machine?
- What SAS content will I have to manually migrate?
- Should I use internal SAS accounts where I can?

**Step 2: Perform Pre-migration Tasks**

Looking at your migration design, you might have identified some of your hardware that might need to be upgraded or operating systems patched and third-party software updated.

During the pre-migration task phase, you will create a migration package that contains your current SAS data and configuration to use the SAS Migration Utility. The other major SAS migration tool, the SAS Deployment Wizard, uses your migration package as input to move your earlier SAS content successfully to SAS 9.4.
In addition to the SAS migration package, the wizard also relies on the presence of another package—SAS Software Depot—that contains SAS 9.4 installation files. You create a SAS Software Depot when you download your SAS 9.4 order, or from removable media that you receive directly from SAS.

**Step 3: Install SAS 9.4 and Migrate Your SAS Content**

Step three is when you use the SAS Deployment Wizard to install SAS 9.4 and to migrate your current SAS content and configuration that you packaged using the SAS Migration Utility in step two.

**Step 4: Perform Post-migration Tasks**

Step four consists of performing manual tasks like running authorization differences reports and moving content that the migration utility did not migrate.

**Step 5: Validate Your Migration**

An important final step in migration is validating that your SAS 9.4 servers, clients, middle tier, and web clients are functioning and can use migrated content from your earlier SAS version.

For a discussion of functionality changes in SAS 9.4, see *SAS Guide to Software Updates and Product Changes.*
Chapter 2
Designing Your Migration

Overview of Designing Your Migration ..................................................... 14
Review High-Level SAS Migration Requirements ................................. 15
Assess Your Hardware and Third-Party Software ................................. 16
Memory Requirement on z/OS ................................................................. 16
Change to SAS 9.2 Internal Account Password Hashing .................... 16
Avoiding Path Conflicts with the SAS Application Server Configuration . 17
Location for the SAS Content Server Repository .................................. 17
SAS Data Management Server Consideration ...................................... 17
Prohibition on SASMeta Server Components ...................................... 18
Inventorying Your Current SAS Deployment ...................................... 18
  Overview of Inventorying Your Current SAS Deployment .................. 18
  Complete a Migration Utility Checklist .............................................. 19
  Check Backups in SAS 9.4 or SAS 9.4_M1 ........................................ 21
  Prepare Your Metadata Repositories ............................................... 21
  SAS Migration Utility Requirements ............................................... 22
  Download the SAS Migration Utility ................................................. 23
  Develop a Common SAS Migration Utility Properties File .............. 24
  Review Product-Specific SAS Migration Utility Properties ............. 26
  Create a Migration Analysis Report ............................................... 26
  View and Analyze Your Migration Analysis Report ......................... 29
  View and Analyze the Migration Log .............................................. 31
  A Note about SAS Tables Stored under the SAS Configuration Directory . 31
Middle-Tier Considerations ................................................................. 31
  Overview of Middle-Tier Considerations ....................................... 31
  Support for 64-Bit Middle Tier Only .............................................. 32
  New SAS Web Application Server in SAS 9.4 .................................. 32
  Automatically Configure Your Web Application Server ................... 32
  SAS Web Application Server Clustering .......................................... 32
Obtain a Valid SAS 9.4 Deployment Plan ........................................... 33
Schedule User Downtime ..................................................................... 33
Overview of Designing Your Migration

Designing your migration is the first of five steps required to install SAS 9.4 and migrate your current SAS content:

1. Design your migration.
2. Perform pre-migration tasks.
3. Install SAS 9.4 and migrate your content from an earlier SAS version.
4. Perform post-migration tasks.
5. Validate your migration.

Designing your migration means reviewing the SAS 9.4 requirements (hardware, software, and migration) against your current SAS deployment, and developing a plan for how to get your SAS content (your data and configuration) integrated into a SAS 9.4 system. Depending on your SAS deployment, you might find these documents helpful:

- For a discussion of functionality changes in SAS 9.4, see *SAS Guide to Software Updates and Product Changes*.
- For SAS solutions, see the product's documentation for additional information about migration and promotion. For more information, see “Migrating SAS Solutions” on page 10.
- If you are migrating to SAS Enterprise Miner, then you should also consult the *SAS Enterprise Miner: Administration and Configuration*.
- If you are migrating to SAS Model Manager, then you should also consult the *SAS Model Manager Migration Guide*.

The SAS Migration Utility generates a migration analysis report. Using this report, you can analyze every machine in your current SAS deployment to answer this crucial design question: “Which SAS products reside on each machine?” It is essential for your SAS representative to know exactly which products reside on which machines in order to provide you with the correct SAS 9.4 deployment plan (required to install SAS 9.4).

At the end of the migration design phase, you will have accomplished the following:

Table 2.1  Migration Design Goals and Actions

<table>
<thead>
<tr>
<th>Migration Design Goals</th>
<th>Actions</th>
</tr>
</thead>
</table>
| Understand the high-level SAS migration requirements. | Review “High-Level SAS Migration Requirements” on page 8.  
Decide the proper time for you to migrate to SAS 9.4. |
| Understand migration requirements and processes specific to your SAS solutions. | See “Migrating SAS Solutions” on page 10.  
Read the migration guide for your SAS solutions. |
<table>
<thead>
<tr>
<th>Migration Design Goals</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure that your hardware and third-party software meet the SAS 9.4 system requirements.</td>
<td>See “Assess Your Hardware and Third-Party Software” on page 16.&lt;br&gt;Plan to address hardware and software gaps as necessary.</td>
</tr>
<tr>
<td>Determine which SAS products reside on each machine.</td>
<td>Run a SAS migration analysis report.&lt;br&gt;For more information, see “Inventorying Your Current SAS Deployment” on page 18.</td>
</tr>
<tr>
<td>Consider how to migrate your middle tier.</td>
<td>Review “Middle-Tier Considerations” on page 31.&lt;br&gt;Automatic configuration of the SAS web server and web application servers is highly recommended during the migration process. After these servers are automatically configured, you can later reconfigure them manually if necessary by using the scripting tool information in the SAS Intelligence Platform: Middle-Tier Administration Guide. In SAS 9.4 it is also possible to create a clustered middle tier using additional middle-tier machines during the migration process.</td>
</tr>
<tr>
<td>Obtain a SAS 9.4 deployment plan.</td>
<td>Having a recent migration analysis report at hand, contact your SAS representative to obtain a valid SAS 9.4 deployment plan that represents your current SAS deployment. For more information, see “Obtain a Valid SAS 9.4 Deployment Plan” on page 33.</td>
</tr>
<tr>
<td>Plan SAS user downtime at your site.</td>
<td>You will need to schedule a window of time when your SAS deployment is down in order to install and configure SAS 9.4 and migrate your SAS content.</td>
</tr>
</tbody>
</table>

**Review High-Level SAS Migration Requirements**

Review the SAS migration requirements that are listed in “High-Level SAS Migration Requirements” on page 8.

If the SAS migration requirements are not in sync with your site's needs, consider the partial promotion alternative. For more information, see “Approaches for Upgrading to SAS 9.4” on page 2.
Assess Your Hardware and Third-Party Software

Part of designing your migration is to evaluate how your hardware and third-party software match the requirements for SAS 9.4.

Migration from any version of SAS requires additional disk space equal to at least twice the amount of disk space that you currently use for your metadata repositories and WebDAV content. For example, if your current SAS metadata repositories and WebDAV content currently occupy 2GB of disk space, you will need at a minimum an additional 4GB of disk space to migrate to SAS 9.4.

The SAS 9.4 middle tier no longer supports 32-bit operating systems. Therefore, your site must plan for using a 64-bit machine for hosting the SAS middle tier.

In SAS 9.4, a new metadata backup facility was added. For SAS 9.4 Windows systems that back up metadata to a non-local drive, temporary space is needed on the SAS 9.4 target machine to copy the migrated metadata from the migration package to a local directory and recover using that local directory. The local directory is created specifically for the purpose of recovering and is deleted when recovery is complete. For this reason, you should plan on making available additional disk space on the metadata server machine during your migration.

Consult the following websites for the latest SAS 9.4 system requirements and any alert-level SAS Notes:

- SAS 9.4 system requirements:
  
  http://support.sas.com/resources/sysreq/index.html

- SAS Notes for alert status installation problems:
  

Memory Requirement on z/OS

The user account under which the SAS Migration Utility and the SAS Deployment Wizard run needs to have sufficient memory allocation.

We recommend that the value for the z/OS MEMLIMIT and ASSIZEMAX options be 2GB, respectively.

Change to SAS 9.2 Internal Account Password Hashing

In SAS 9.2, the only method available to hash passwords for internal SAS accounts was the MD5 hash algorithm. In order to comply with the FIPS 140-2 standard, later SAS versions support SHA256. Although SAS deployments using SAS/SECURE generate no new password hashes with MD5, during a migration the existing password hash is in MD5 and must remain in MD5 to be validated. For an internal account in SAS that contains SAS/SECURE, the only way to stop using the MD5 hash is to change the
password to a new value. This causes SAS to generate and store a new SHA256 hash and to move the existing MD5 hash to the history list.

The history list maintains a maximum of five password hashes to prevent a person from using any of the previous five passwords as a new password. This enforcement is optional. The MD5 hashes will move through the history list as a person changes passwords over time, being replaced by SHA256 hashes. In order to remove all MD5 hashes from the history list, a user would have to change passwords five times.

During a migration, the SAS Deployment Wizard gives you the opportunity to change the passwords for your SAS internal accounts. For more information, see Unrestricted Administrator on page 75.

---

**Avoiding Path Conflicts with the SAS Application Server Configuration**

There is a path conflict when SAS data package directories share the same configuration path as the current SAS Application Server.

To avoid a situation where SAS Application Server configuration files such as sasv9.cfg are inadvertently overwritten, the SAS Migration Utility does not migrate directories that have path conflicts. Check the migration utility and the analysis report for any path conflicts, and manually resolve these issues. For more information, visit http://support.sas.com/rnd/migration/utility/messages.html.

---

**Location for the SAS Content Server Repository**

In SAS 9.4, you have the option of storing your SAS Content Server repository data in the database configured for the SAS Web Infrastructure Platform. (When running the SAS Deployment Wizard, you select whether to use the SAS Web Infrastructure Platform Data Server for this data on the SAS Web Infrastructure Platform Database: Data Server wizard page. If you do not choose to use the database configured for the SAS Web Infrastructure Platform, you will select your SAS Web Infrastructure Platform database type on the SAS Web Infrastructure Platform: Database Type wizard page.)

To access this SAS Deployment Wizard option during migration, be sure to choose either the Typical or Custom prompting levels. For more information, see Chapter 9, "Administering the SAS Content Server," in SAS Intelligence Platform: Middle-Tier Administration Guide.

---

**SAS Data Management Server Consideration**

SAS Data Management Server deploys differently than SAS products.

SAS Data Management Server writes its configuration to a subdirectory under SAS Home. Most SAS 9.4 products write their configurations to a directory outside of SAS Home. (For example, to C:\SAS\Config.)

Therefore, if you plan to have different deployments of SAS Data Management Server on the same machine, you must specify a new SAS Home for each instance.
Prohibition on SASMeta Server Components

You cannot migrate SAS 9.2 and 9.3 deployments to SAS 9.4 when those deployments use the following SASMeta SAS Application Server components:

- SAS Workspace Server
- SAS DATA step batch server

These SASMeta SAS Application Server components are not available in SAS 9.4. Contact SAS Technical Support to identify what manual steps might be required in order to migrate your system.

Figure 2.1  SASMeta Server Components Shown in SAS Management Console

InventorYing Your Current SAS Deployment

Overview of Inventorying Your Current SAS Deployment

A key to successfully migrating your SAS content—data and configuration—is knowing exactly what SAS products you are running on each machine at your site. SAS provides a tool to help you do just that. The SAS Migration Utility sweeps a machine to locate your current SAS content and performs a validation to ensure that the content can be reliably migrated. During this analyze phase, the migration utility also generates a migration analysis report. Using this report, you can determine those SAS products found on your current SAS system to be eligible for automatic migration with the SAS Deployment Wizard.

You can obtain The SAS Migration Utility in two ways: by downloading it from the SAS Support website or by locating the version that is shipped with your SAS 9.4 order. Later in this manual when you are instructed to build a migration package, make sure that you use the version of the migration utility that is shipped with your SAS 9.4 order. For more information, see “Create the Migration Package” on page 63.

Here are the steps for inventorying your current SAS deployment:

1. “Complete a Migration Utility Checklist” on page 19
2. “Check Backups in SAS 9.4 or SAS 9.4_M1” on page 21
3. “Prepare Your Metadata Repositories” on page 21
4. “SAS Migration Utility Requirements” on page 22
5. “Download the SAS Migration Utility” on page 23
Complete a Migration Utility Checklist

The SAS Migration Utility relies on a set of input values such as where you have installed SAS and SAS Metadata Server connection information. We recommend that you compile a list of the necessary input values before you run the migration utility.

*Note:* If you have not installed SAS in the same directory on each machine, then complete the following table for every machine in your current SAS deployment.

**Table 2.2  SAS Migration Utility Checklist**

<table>
<thead>
<tr>
<th>Migration Utility Input</th>
<th>Default Value</th>
<th>Actual Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute path to the SAS configuration directory</td>
<td>C:\SAS\configuration-name</td>
<td>/users/sas/SAS/configuration-name</td>
</tr>
<tr>
<td>Absolute path to the SAS executable</td>
<td>SAS 9.4 C:\Program Files\SASHome \SASFoundation\9.4 /users/sas/SASHome/SASFoundation</td>
<td>SAS 9.3 C:\Program Files\SASHome \SASFoundation\9.3 /users/sas/SASHome/SASFoundation</td>
</tr>
<tr>
<td>Absolute path to the top-level directory where SAS products are installed</td>
<td>SAS 9.4 C:\Program Files\SASHome /users/sas/SASHome</td>
<td>SAS 9.3 C:\Program Files\SASHome /users/sas/SASHome</td>
</tr>
</tbody>
</table>

Inventorying Your Current SAS Deployment
<table>
<thead>
<tr>
<th>Migration Utility Input</th>
<th>Default Value</th>
<th>Actual Value</th>
</tr>
</thead>
</table>
| Metadata server connection profile pathname | C:"\Documents and Settings\user-ID \Application Data\SAS \MetadataServerProfiles \myprofile.swa  
$HOME/ MetadataServerProfiles/ myprofile.swa |                                                                                   |
| Metadata server name    | No default value                                                              |                                                                              |
| Metadata server port    | 8561                                                                          |                                                                              |
| Unrestricted user ID and its password | sasadm                                                                       |                                                                              |
| Product-specific properties |                                                                                 | Not applicable                                                                 |
| JDBC connection credentials for the Shared Services database." | SharedServices For JBoss Application Server, look here:†  
JBoss-Home/SASServer1/deploy/  
SharedServices-ds.xml  
For WebLogic Server and WebSphere Application Server, use your respective admin console.† |                                                                              |
| SMU.scs.allow.sync      | This property pauses the migration utility and prompts you to stop the SAS Content Server.  
For more information, see SMU.scs.allow.sync on page 146.*** | To set property to true:  
SMU.scs.allow.sync=true |
| SMU.isMultipleTierMachine=true | Set this property to true when multiple SAS tiers are deployed on the same machine.  
For more information, see SMU.isMultipleTierMachine on page 146. | To set property to true:  
SMU.isMultipleTierMachine=true |

* You can use a connection profile or provide the equivalent metadata server information in the migration utility command line or in a utility properties file.

** (In SAS 9.4, this is referred to as the SAS Web Infrastructure Platform database.)

*** Required when you are migrating a SAS 9.2 middle tier only.

† Applicable only to SAS 9.2 and 9.3.
**Check Backups in SAS 9.4 or SAS 9.4_M1**

In SAS 9.4 and SAS 9.4 M1, there is a defect with the Deployment Backup and Recovery Tool that involves multiple instances of the tool. Before you create your migration package, check for multiple instances of the web archive file, sas.svcs.admin.backup.war, under your SAS Web Application Servers. If you find multiple instances, then contact SAS Technical Support before attempting your migration. By default, web application backup WAR files are located under `SAS-configuration-directory/Web/WebAppServer/SASServer1_n/sas_webapps`.

**Prepare Your Metadata Repositories**

Before you migrate your metadata repositories, prepare for migration by performing the following steps:

1. Before you begin preparing your metadata repositories, back them up.
   - For more information, see the *SAS Intelligence Platform: System Administration Guide* for SAS 9.2 or for SAS 9.3.
   - **Note:** If you are using the `%OMABAKUP` macro, do not specify the REORG option.

2. In SAS Data Integration Studio, check in all objects from project repositories.
   - For more information, see “Administering SAS Data Integration Studio” in *SAS Intelligence Platform: Desktop Application Administration Guide* at appropriate for your version at: [http://support.sas.com/documentation/onlinedoc/etls](http://support.sas.com/documentation/onlinedoc/etls)

3. Delete any unused directory objects such as libraries, stored processes, and deployed jobs.

4. Delete any servers or spawner definitions that are not being used.

5. Remove user directories for users that no longer exist.

6. If you imported user definitions from an enterprise source using the import macros, rerun these macros and reconcile new and deleted users.

7. Back up your metadata repository again.
   - **Note:** If you are using the `%OMABAKUP` macro, specify the REORG option.

8. Delete any orphaned metadata objects.
   - The SAS Migration Utility analysis report on your metadata tier helps you identify orphaned objects. So you might want to perform this step later, after reviewing the report.

9. Document any custom values in your metadata, such as the following:
   - additional users and group profiles under your Foundation Services deployments
   - server start-up commands
   - configuration values for servers
Note: The migration utility ignores metadata repositories with a state of OFFLINE or READONLY.

SAS Migration Utility Requirements

Here are the requirements for installing and running the SAS Migration Utility:

- The migration utility must be run on every machine that is running the current version of the SAS Intelligence Platform. (Run the migration utility on machines that contain the SAS server tier or middle tier only. Do not run the migration utility on middle-tier cluster machines and machines that contain SAS clients only.)

For SAS multiple-machine deployments, we recommend that you copy the utility to shared network storage that is accessible from every SAS machine to avoid having to copy the migration utility separately on each machine. You can then log on to each machine and execute the utility from this shared network storage location.

- On SAS multiple machine deployments, run the migration utility first on the machine hosting the SAS Metadata Server.

- On SAS deployments that use clustered metadata servers, run the migration utility on the first metadata server node. For more information, see “Packaging SAS Content on a Metadata Server Cluster” on page 41.

- The user account with which you run the migration utility (the SAS installer account) must have Read access to all directories under the current SAS configuration directory for each machine.

CAUTION:
To avoid unauthorized access to sensitive information, we recommend that the location where the migration utility writes package information (SMU.Output.Dir) be properly secured with file access permissions, readable by the migration utility and the SAS installer users only.

- On SAS multiple-machine deployments, the migration utility must be able to write to (and read from) its output directory.

We recommend that the utility output directory be on shared network storage accessible to every SAS machine in the deployment. For an example, see the following figure:
If no shared storage is available, then you must copy the migration package to each successive machine to cause the migration utility to add the machine's content to the migration package. (The metadata server must be packaged first.) If you use File Transport Protocol (FTP) to copy the migration package, make sure that you specify the file transfer type to binary.

- The SAS Content Server on Windows runs, by default, under the LOCALSYSTEM account, which does not have network privileges. If you are writing the content server package to shared storage, then please see “Packaging SAS Content Server on Windows” on page 42.

- SAS Foundation and certain SAS Client Applications require the use of a Java Runtime Environment (JRE). Starting with SAS 9.4, a private JRE is provided by SAS and installed by the SAS Deployment Wizard on all platforms other than z/OS. For information about the JRE required by SAS on z/OS, see the third-party software page, available at http://support.sas.com/resources/thirdpartysupport/index.html.

The migration utility also requires the JRE and uses the JRE that your SAS deployment uses. The migration utility locates the JRE using the SMU.SASHOME property or the sasproductdir command line option.

**Download the SAS Migration Utility**

You do not have to wait for your SAS 9.4 order to arrive to begin using the SAS Migration Utility. Simply go to the SAS product download site to download the migration utility:

1. Ensure that you have met the requirements listed in the topic, “SAS Migration Utility Requirements” on page 22.
2. On a machine that has internet access, point a web browser to the following URL:
   
   http://www.sas.com/apps/demosdownloads/setupintro.jsp
3. Search for the SAS Migration Utility.
4. After you have downloaded the migration utility, move the utility to a storage location that is accessible to your current SAS deployment (such as a shared network drive).

There is a unique SAS Migration Utility for each supported operating system family. If your current SAS deployment is a multi-platform deployment, you will have to download the appropriate migration utility for the operating systems on which you have deployed SAS: Windows, UNIX, and z/OS.

Note: This version of the SAS Migration Utility is provided for users who have not yet received their SAS 9.4 software, and are interested in assessing the scope of migration for their currently installed products. When you receive your SAS 9.4 software, you should use the version of the SAS Migration Utility that is included with the order to perform the migration, guaranteeing compatibility with the versions of the products ordered.

5. On UNIX and z/OS, remember to assign Execute permissions before running the downloaded file.

For more information, refer to your UNIX or z/OS documentation.

Develop a Common SAS Migration Utility Properties File

As the SAS Migration Utility is run from an operating system prompt or command line, entering a set of invocation options can be error prone. If you deployed SAS in a similar manner across multiple machines, you can benefit from creating a common migration utility properties file and reduce the amount of input that you must enter on the migration utility command line.

Note: SAS supplies a migration utility template file (smu.properties.template) that provides examples for how to use various properties. You can find the template file at the same URL where you download the SAS Migration Utility: http://www.sas.com/apps/demosdownloads/setupintro.jsp. SAS also ships a version-specific template with the SAS Software Depot in the smu92, smu93, and smu94 subdirectories underneath utilities. For more information, see “Running the Migration Utility Using a Properties File” on page 146.

Follow these steps to create a common migration utility properties file:


2. Add any necessary product-specific migration utility properties. (See the topic, “Review Product-Specific SAS Migration Utility Properties” on page 26.)

3. Make sure that you have Write access to a migration utility executable directory that is network-shared and accessible from each machine on which you are running SAS.

4. Referring to your completed migration utility checklist and to the following table, use a text editor to add the required migration utility properties to your properties file.

CAUTION:
We recommend that you encode any passwords used in a migration utility properties file. The migration utility supports the \{sas002\} method through \texttt{PROC PWENCODE}. For more information, see .

5. Save your properties file in the migration utility executable directory.

\textit{Table 2.3} \textit{Required SAS Migration Utility Properties}

<table>
<thead>
<tr>
<th>Required Migration Utility Property</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMU.config.dir</td>
<td>SMU.config.dir=C:\SAS\BIserver\Lev1</td>
</tr>
<tr>
<td></td>
<td>SMU.config.dir=/users/sas/SAS/biserver/Lev1</td>
</tr>
<tr>
<td></td>
<td>SMU.config.dir=/usr/lpp/SASConfig/Lev1</td>
</tr>
<tr>
<td>SMU.SASROOT</td>
<td>SMU.SASROOT=C:\Program Files\SASHome\SASFoundation\9.4</td>
</tr>
<tr>
<td></td>
<td>SMU.SASROOT=/users/sas/ SAS/SASFoundation/9.4</td>
</tr>
<tr>
<td></td>
<td>SMU.SASROOT=usr/lpp/SASHome/ SASFoundation/9.4</td>
</tr>
<tr>
<td>SMU.SASHOME</td>
<td>SMU.SASHOME=C:\Program Files\SAS</td>
</tr>
<tr>
<td></td>
<td>SMU.SASHOME=/users/sas/</td>
</tr>
<tr>
<td></td>
<td>SMU.SASHOME=/usr/lpp/SASHome</td>
</tr>
<tr>
<td>SMU.Output.Dir</td>
<td>SMU.Output.Dir=C:\SMU\94_Deployment</td>
</tr>
<tr>
<td></td>
<td>SMU.Output.Dir=/smu/94_deployment</td>
</tr>
<tr>
<td></td>
<td>SMU.Output.Dir=/user-ID/SMU/SMU_Package</td>
</tr>
<tr>
<td>SMU.webinfpltfm.dbms.userid</td>
<td>SMU.webinfpltfm.dbms.userid=myDatabaseUserID</td>
</tr>
<tr>
<td>SMU.webinfpltfm.dbms.password</td>
<td>SMU.webinfpltfm.dbms.password={SAS002}DBC C571245AD0B31433834F80BD2B99E16B3C969</td>
</tr>
<tr>
<td>SMU.scs.allow.sync**</td>
<td>SMU.scs.allow.sync=true</td>
</tr>
<tr>
<td>SMU.isMultipleTierMachine***</td>
<td>SMU.isMultipleTierMachine=true</td>
</tr>
</tbody>
</table>

* Paths containing spaces in properties files do \textit{not} require double quotation marks.

** Required when you are migrating a SAS 9.2 middle tier only.

*** Required when multiple SAS tiers are deployed on the same machine.

\textbf{CAUTION:}

To avoid unauthorized access to sensitive information, we recommend that the location where the migration utility writes package information (SMU.Output.Dir) be properly secured with file access permissions, readable by the migration utility and the SAS installer users only.
**Review Product-Specific SAS Migration Utility Properties**

Some SAS products have unique properties that the SAS Migration Utility uses when creating a migration analysis report, or later in the process when the utility builds a migration package. For more information, see “Product-Specific SAS Migration Utility Properties Overview” on page 153.

**Create a Migration Analysis Report**

The SAS Migration Utility has two execution modes: an analyze mode and a package mode. Before creating a migration package that the SAS Deployment Wizard uses to perform the actual migration, we recommend that you run the migration utility in analyze mode in order to create a migration analysis report. This report is useful in helping you determine exactly which SAS products are deployed on each machine in your current SAS system.

*Figure 2.3  Sample Migration Analysis Report*

Follow these steps to create a migration analysis report:

1. Review the migration utility requirements.
   
   For more information, see “SAS Migration Utility Requirements” on page 22.

2. If you have not already, complete a migration utility checklist.
   
   For more information, see “Complete a Migration Utility Checklist” on page 19.

3. Verify that the SAS Metadata Server is running.

4. If you are creating a migration package on middle-tier machine, verify that the following applications are running:
5. Log on to the SAS machine (the source machine) that you want to inventory.

   Note: On SAS multiple-machine deployments, run the migration utility first on the machine hosting the SAS Metadata Server. You can run the migration utility on the remaining tiers in any order. Do not run the migration utility on middle-tier cluster machines and machines that contain SAS clients only.

6. If the version of the migration utility that you are using has changed from one that you have used previously, then be sure to delete the migration utility's output directory. (For example, in the past, you might have downloaded and run an earlier version of the migration utility to create an analysis report. If so, delete the output created by the older migration utility.)

7. Change to the SAS Migration Utility executable directory. By default, this is the smu-version subdirectory under the utilities directory in your SAS Software Depot.

8. Review the section, “smu Command Notes” on page 141.

9. Use the common migration utility properties file and the common connection profile that you have developed, unless the source machine requires any special modifications (for example, SAS is installed on a machine-specific path).

   For more information, see “Develop a Common SAS Migration Utility Properties File” on page 24.

10. Add any necessary product-specific migration utility properties to your properties file. (See “Review Product-Specific SAS Migration Utility Properties” on page 26.)

11. Invoke the migration utility to run in analyze mode, using the following command from an operating system prompt or command line:

    SAS 9.2 on Windows 32-bit
    ```
    smu92_32 -analyze -properties absolute pathname to property file -replace
    ```

    SAS 9.2 on Windows 64-bit
    ```
    smu92_x64 -analyze -properties absolute pathname to property file -replace
    ```

    SAS 9.3 on Windows 32-bit
    ```
    smu93_32 -analyze -properties absolute pathname to property file -replace
    ```

    SAS 9.3 on Windows 64-bit
    ```
    smu93_x64 -analyze -properties absolute pathname to property file -replace
    ```
SAS 9.4 on Windows 32-bit
   smu94_32  -analyze -properties absolute pathname to
   property file -replace

SAS 9.4 on Windows 64-bit
   smu94_x64  -analyze -properties absolute pathname to
   property file -replace

SAS 9.2 on UNIX
   ./smu92  -- -analyze -properties absolute pathname to
   property file -replace

SAS 9.3 on UNIX
   ./smu93  -- -analyze -properties absolute pathname to
   property file -replace

SAS 9.4 on UNIX
   ./smu94  -- -analyze -properties absolute pathname to
   property file -replace

SAS 9.2 on z/OS
   ./smu92.zos  -- -analyze -properties absolute pathname to
   property file -replace

SAS 9.3 on z/OS
   ./smu93.zos  -- -analyze -properties absolute pathname to
   property file -replace

SAS 9.4 on z/OS
   ./smu94.zos  -- -analyze -properties absolute pathname to
   property file -replace

For more information about migration utility commands, see “SAS Migration Utility
Overview” on page 135.

Note: If you are including WebDAV content in your migration package, it does not
matter where the WebDAV store is located in your current SAS environment. The
migration utility copies WebDAV content to the configured WebDAV location in
your 9.4 environment. In a default SAS 9.4 configuration, that WebDAV location
is the SAS Content Server.

12. The migration utility writes the inventory report (FullReport.html) to the
AnalysisReport subdirectory underneath the output directory that you specified
in the migration utility properties file.

13. To verify that the inventory report successfully completed, open the migration utility
log file and scroll to the very end of the log. (The migrate.log file resides in the top-
level directory of your migration utility output directory.)

If you see output similar to the following, then the migration utility finished
executing the report:

10:52:55,720 [INFO ] SMU No packaging was performed due to
the mode setting.

If you do not see output lines similar to these, then the migration utility was unable
to complete. A common cause can be lack of available disk space.

14. If you have a multi-tier SAS deployment, you will need to create a migration
analysis report for each machine. There are specific options depending on the tier
(for example, -davtier). For more information, see “SAS Migration Utility
Overview” on page 135.
Note: You cannot run the migration utility on more than one machine simultaneously, because the migration schema might be updated by more than one process at the same time.

**View and Analyze Your Migration Analysis Report**

With your migration analysis report in hand, you and your SAS representative can determine what, if any, further maintenance must be applied to your current SAS products in order for your system to be eligible for automatic migration with the SAS Deployment Wizard.

**Figure 2.4 Sample Migration Analysis Report**

To view your migration analysis report, open FullReport.html in your web browser. (FullReport.html resides in the `AnalysisReport` subdirectory underneath the output directory that you specified when you last ran the SAS Migration Utility.)

Using the report, answer these questions:

- Has the SAS Migration Utility identified any SAS products that are not eligible for automatic migration to SAS 9.4?
- Are my SAS products deployed on the machines where I expected them?

The analysis report also generates a list of all the SAS products configured in your deployment.
This list of configured products can be helpful in creating a SAS 9.4 deployment plan to use with the SAS Deployment Wizard during the installation and migration task of your SAS 9.4 migration.

For more explanation on analysis report messages, go to http://support.sas.com/rnd/migration/utility/messages.html.

Starting in SAS 9.4M1, the analysis report offers version analysis. The SAS Migration Utility compares the versions of SAS offerings on your source deployment with a product migration matrix and lists all versions of SAS offerings that are unable to be directly migrated to SAS 9.4.

Using this information, you can review your SAS Software Summary (ordersummary.html) to determine whether the products in your order are supported for automated migration to SAS 9.4. The software summary resides in your SAS Software Depot in install_doc/order-number/ordersummary.html.
When considering version analysis, carefully choose which version of the SAS Migration Utility to run. As a planning exercise, you can download and run the migration utility from support.sas.com to determine whether you are ready to place your SAS software order. However, new product updates after you place your order might include support for migration. Therefore, running the migration utility that accompanies your order ensures accurate version analysis in your analysis report.

**View and Analyze the Migration Log**

In addition to studying your migration analysis report, the log file produced by the SAS Migration Utility can also detect possible problems with your content. The migration utility creates a log file in the output directory for each machine on which it is run (for example, `C:\migration_package\web_tier\migrate.log`).

**A Note about SAS Tables Stored under the SAS Configuration Directory**

Even though the SAS automated migration tools migrate SAS tables that reside under the current SAS configuration directory and in a `SASEnvironment` or `Data` folder, the best practice is to store your SAS tables outside the SAS configuration directory. Migrating large amounts of data encountered under the configuration directory slows migration utility performance.

### Middle-Tier Considerations

**Overview of Middle-Tier Considerations**

The following topics are contained in this section:

- “Support for 64-Bit Middle Tier Only” on page 32
Support for 64-Bit Middle Tier Only

The SAS 9.4 middle tier is supported on 64-bit operating systems only.

New SAS Web Application Server in SAS 9.4

In SAS 9.4, the SAS Web Application Server replaces support for third-party web application servers.

Migration from SAS 9.3 to SAS 9.4 is no different from migrating from one web application server to another in previous versions of SAS. The SAS Migration Utility updates the web application server configuration metadata and preserves any SAS solution dependencies. This means that existing SAS software middle tiers implemented with JBoss, WebSphere, and WebLogic are converted to a SAS Web Application Server implementation during migration.

Automatically Configure Your Web Application Server

The SAS Deployment Wizard defaults to automatically building and configuring the SAS web applications as well as configuring a web application server for use with SAS 9.4.

By default, when the SAS Deployment Wizard configures the SAS 9.4 middle tier, it automatically creates and configures one or more instances 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 SAS Web Application Server with the SAS web applications.

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

SAS Web Application Server Clustering

Server clustering provides availability and enhances performance. In SAS 9.4, enhancements have been made to the deployment model to better support clustering of SAS Web Application Servers. You can easily configure vertical cluster members (additional server instances on the same machine) and horizontal cluster members (install and configure servers on additional machines). Combining vertical and horizontal clustering is also supported and can be configured easily.

For more information, see SAS Intelligence Platform: Middle-Tier Administration Guide.
Obtain a Valid SAS 9.4 Deployment Plan

After you understand exactly which current SAS products you have deployed and on which machines and operating systems, you can contact your SAS representative to obtain a valid SAS 9.4 deployment plan. A deployment plan is a crucial component of the SAS Deployment Wizard, which is the tool that you will use to install SAS 9.4 and migrate the package containing your current SAS data and configuration. When you contact your SAS representative, it is helpful to have a migration analysis report that represents the current status of your SAS deployment. For more information, see “Changes After SAS 9.2 That Affect the Deployment Plan” on page 73.

Schedule User Downtime

During the migration process, you should schedule downtime for users relying on the current SAS deployment, to ensure that all metadata and physical content stay in sync as the current SAS content is migrated to SAS 9.4.

Also, when the migration utility creates the migration package, it actually pauses the metadata server. Therefore, you are unable to use your current SAS system during this period.
Chapter 3
Performing Pre-migration Tasks

Overview of Performing Pre-migration Tasks
You must now carry out any pre-migration tasks that you identified in your migration design phase, along with some new tasks that are a part of all SAS migrations.
Performing pre-migration tasks is the second of five steps required to install SAS 9.3 and migrate your current SAS content:

1. Design your migration.
2. Perform pre-migration tasks.
3. Install SAS 9.4 and migrate your content from an earlier SAS version.
4. Perform post-migration tasks.
5. Validate your migration.

Looking back at your migration design, you might have identified some of your current SAS products that require maintenance before you can migrate them. Also, some of your hardware might need to be upgraded or operating systems patched and third-party software updated.

During the pre-migration task phase, you will create a migration package that contains your current SAS data and configuration using the SAS Migration Utility. The other major SAS migration tool, the SAS Deployment Wizard, uses your migration package as input to move your current SAS content successfully to SAS 9.4.

In addition to the SAS migration package, the wizard also relies on the presence of another package—SAS Software Depot—that contains SAS 9.4 installation files. You create a SAS Software Depot when you download your SAS 9.4 order, or from removable media that you receive directly from SAS.
When you have completed the pre-migration tasks, you will have accomplished the following:

1. backed up your current SAS deployment.
   This is a best practice to ensure that your current SAS deployment is protected.
   For more information, see “Back Up Your Current SAS System” on page 38.

2. applied required maintenance to any current SAS products.
   During your migration design, you identified any current SAS products that require maintenance before you can migrate them.
   For more information, see “Apply Any Required SAS Maintenance” on page 38.

3. completed the pre-migration checklists.
   The SAS Deployment Wizard prompts you for the required operating system accounts that you used with SAS and for ports to designate for the new SAS 9.4 servers.
For more information, see “Completing the Pre-migration Checklists” on page 39.


   SAS provides a third-party software site that tells you what to install, how to get it, and how to install it.

   For more information, see “Installing Third-Party Software” on page 45.

5. created a SAS 9.4 Software Depot.

   The SAS Software Depot contains the SAS installation files used by the SAS Deployment Wizard to install and configure SAS 9.4.

   For more information, see “Creating SAS Software Depots” on page 47.

6. created a migration package.

   Using the SAS Migration Utility, you create a package containing your current SAS data and configuration that the SAS Deployment Wizard uses.

   For more information, see “Create the Migration Package” on page 63.

---

**Back Up Your Current SAS System**

As a best practice, we recommend that you make sure that you have an up-to-date operating system backup of your current SAS deployment. If you have a multi-machine deployment, this means your SAS Metadata Server machine, server tier, middle tier, and data tier.

On each machine, make sure that you have backed up the following directories:

- SAS installation directory and all of its child directories (for example, `C:\Program Files\SASHome`).
- SAS configuration directory and all of its child directories (for example, `C:\SAS\Config`).

On the metadata server machine, back up the earlier listed directories plus all metadata repositories.

For more information, see “About Backing Up and Restoring Your SAS Content” in *SAS Intelligence Platform: System Administration Guide*.

For all backups that you make, follow your site’s established backup procedures.

**CAUTION:**

As you would with any backup, run these backups through your site’s validation procedures to be confident of their integrity before proceeding with your SAS migration.

---

**Apply Any Required SAS Maintenance**

When you designed your SAS migration, you might have discovered that one or more of your current SAS products are ineligible for migration and require that maintenance patches be applied. Your SAS representative can help you get the necessary maintenance
that your products require. Follow the instructions provided for this, and make sure that all the affected products have been patched.

*Note:* After you have applied the necessary maintenance, we recommend that you rerun the migration analysis report on all your affected SAS machines and use the report to verify that all of your current SAS products are now eligible for migration.

For more information, see “Create a Migration Analysis Report” on page 26.

---

**Completing the Pre-migration Checklists**

**Overview of Completing the Pre-migration Checklists**

Locate the SAS pre-installation checklist that you will use to deploy your SAS 9.4 software.

If your SAS representative created a custom deployment plan for your site, then use the checklist that came with the custom plan.

If you are using a standard deployment plan, then use the checklist that came with the standard plan. Standard deployment plans are stored by default in the SAS Software Depot. However, you can download the latest SAS 9.4 standard deployment plans that also contain a corresponding architectural diagram and pre-installation checklist at [http://support.sas.com/installcenter/plans](http://support.sas.com/installcenter/plans).

Once you locate the appropriate checklist for your order, complete it and have it available to refer to when you run the SAS Deployment Wizard, later in the migration process.

Here is additional information that you should consult that will help you complete your checklist:

- “Complete the External User Account Checklist” on page 39
- “Important Notes on User Accounts and Authentication” on page 40
- “Packaging SAS Content on a Metadata Server Cluster” on page 41
- “Packaging SAS Content Server on Windows” on page 42
- “Complete the New Server Ports Checklist” on page 42
- “Review SAS 9.4 Documentation” on page 42
- “SAS BI Dashboard 4.2 (and Earlier) Migration Note” on page 43
- “Determine the Path to Database JDBC JAR Files” on page 44
- “Determine the User ID Associated with Scheduled Flows” on page 44
- “Permission Considerations When User Accounts or Groups Change” on page 44

**Complete the External User Account Checklist**

Make sure that you review important information in the topic, “Important Notes on User Accounts and Authentication” on page 40.

*Note:* If you are migrating to new machines, make sure that the external accounts that you plan to use are present. For more information, see the section on users, groups, and ports in the *SAS Intelligence Platform: Installation and Configuration Guide*.
Important Notes on User Accounts and Authentication

Consider the following items when working with user accounts during the migration process:

- Identities must be unique. You cannot reassign an existing system identity that is associated with a metadata persona in either the current SAS or SAS 9.4 configuration. For example, if the operating system user account sasdemo is associated in metadata with the SAS Demo User persona in your SAS 9.2 system, you cannot also associate in SAS 9.4 with the SAS Anonymous Web User.

- On UNIX systems, the SAS Deployment Wizard requires that you supply the root password during configuration. 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.

- On UNIX and z/OS, the SAS installer account requires permission to invoke the `chown` command on the directories and files being migrated. If the installer account does not have this permission, then you must manually run the permission scripts using the root account after the SAS Deployment Wizard finishes executing. These scripts reside under `SAS-configuration-directory/Temp`.

On Windows, migrated files will be owned by the identity running the SAS Deployment Wizard regardless of their ownership on the current SAS system, but will retain the same effective permissions as on the current SAS system.

- The SAS automated migration tools detect machine name changes for the metadata server during the migration process and automatically changes host name domains in all logins and for the necessary file permissions.

For example, if the metadata server host name changed from “myhost” to “mynewhost,” then all domain logins that are qualified with “myhost” are automatically changed to “mynewhost.” (The tools change “myhost\sasadm” and “myhost\sastrust” to “mynewhost\sasadm” and “mynewhost\sastrust.”)

- The SAS automated migration tools do not automatically change the following:
  - required external user account IDs
    (For example, changing “myhost\ebiadmin” to “myhost\sasadm” or changing “ebiadmin” to “sasadm.”)
    You must specify these new external accounts when prompted for them in the deployment wizard in order to change the SAS metadata. To change the file permissions, use the temp scripts.

    For more information, see “Determine the User ID Associated with Scheduled Flows” on page 44.
  
  - required operating system group (UNIX only)
    (For example, changing the primary group of the SAS Installer user from “sas913” to “sas.”)
    To change the file permissions that involve group membership, use the temp scripts. (There are no SAS metadata changes required when you change an operating system user group.)
For more information, see “Determine the User ID Associated with Scheduled Flows” on page 44.

- 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 9.4 will not function properly. For more information, see the Configuration Guide for SAS 9.4 Foundation for UNIX Environments.

- The SAS Anonymous Web User is used to grant clients access to applicable SAS Web Infrastructure Platform applications such as SAS BI Web Services and the Stored Process Web Application.

- The migration process does not change any existing launch credential assignments. For example, if the SAS 9.2 stored process server has a login (for example, spsrv) as its designated launch credential, that assignment is preserved. If the spsrv account is not valid on the SAS 9.4 machine, the stored process server will not work in the SAS 9.4 environment (until you change that server's launch credential).

**Packaging SAS Content on a Metadata Server Cluster**

On SAS deployments that use clustered metadata servers, run the migration utility on the first metadata server node. (This is the node that was deployed before the other nodes were added, and is also referred to as the initially configured metadata server.)

*Note:* You might need to run the migration utility on additional metadata server nodes, if those nodes contain SAS content that you need to migrate. For example, a machine that hosts a metadata server node might also host the SAS middle tier or a SAS object spawner.

To determine which metadata server node is the first node and identify the machine on which it resides, use SAS Management Console. In the Server Manager, expand the SASMeta server tree. The console displays the nodes in order of creation. In the Connections tab, right-click on the server and select Properties. In the Connection dialog box, note the value in the Host Name field.

**Figure 3.2 SAS Management Console Displaying Metadata Server Nodes**

For more information, see “Managing a Clustered Metadata Server” in *SAS Intelligence Platform: System Administration Guide*. 
Packaging SAS Content Server on Windows

When creating a SAS Migration Utility package for a multi-tier configuration, it is often easier to write the contents directly to a network location that all the machines can access. However, if the SAS Content Server is running on a Windows system, the errors given below might occur when attempting to package that machine:

```
[ERROR ] SMU {SCSExecute.Execute} Target 'Execute' failed with message 'Repository Exception trying to copy repository. HTTP/1.1 500 Internal Server Error'.
[WARN ] SMU Migration target Execute had an error. Repository Exception trying to copy repository. HTTP/1.1 500 Internal Server Error
```

An error occurred. Would you like to:
1 Continue
2 Quit

The problem occurs because the SAS Content Server runs under the SAS Web Application Server, which on Windows is a service that is started by the LOCALSYSTEM account. This account does not have network credentials, and cannot write to the shared network location. You can create a migration package of this machine by doing one of the following:

- Stop the SAS Content Server before creating the package. (To do so requires stopping SASServer1.)
- Create the package in a local directory, and then copy it to the network location.
- Run SASServer1 as a different user that has network credentials.

Complete the New Server Ports Checklist

Complete the ports section of the pre-install checklist to use later, during the installation and migration step, when the SAS Deployment Wizard prompts you for ports to designate for the new SAS servers. The deployment wizard uses the same ports by default when migrating the current SAS servers. You will have the opportunity to select new port numbers for these servers. For information about changing the ports that you use, see the SAS Deployment Wizard Port Remap page on page 87.

Note: If you are migrating to new machines, make sure that the ports that you plan to use are unused. For more information, see the section on users, groups, and ports in the SAS Intelligence Platform: Installation and Configuration Guide. For SAS 9.2, go to: http://support.sas.com/documentation/cdl/en/biig/60946/HTML/default/viewer.htm#a003070263.htm. For SAS 9.3, go to http://support.sas.com/documentation/cdl/en/biig/62611/HTML/default/viewer.htm#p02intellplatform00installgd.htm.

Review SAS 9.4 Documentation

It is very important to review all the different documents associated with deploying your SAS 9.4 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: Migration Guide.

Your review should include these documents:

- QuickStart Guide (or Installation Instructions for z/OS)
This document is shipped with your SAS software. Follow its instructions.

The QuickStart Guides are also available online:

- **UNIX:** [http://support.sas.com/documentation/installcenter/94/unx/index.html](http://support.sas.com/documentation/installcenter/94/unx/index.html)
- **z/OS:** [http://support.sas.com/documentation/installcenter/94/mvs/index.html](http://support.sas.com/documentation/installcenter/94/mvs/index.html)

- **software order email (SOE)**

This email is sent to your site to announce the software and detail the order. It also enumerates the initial installation steps and, for SAS 9.4, 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 are in your order and when the order was fulfilled. 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 document, which lists only 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” in *SAS Intelligence Platform: Installation and Configuration Guide*.

- **system requirements**

  Available at [http://support.sas.com/resources/sysreq/index.html](http://support.sas.com/resources/sysreq/index.html)

- **SAS Notes**


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

  Available at these locations:
  - [http://support.sas.com/documentation/onlinedoc/fm](http://support.sas.com/documentation/onlinedoc/fm)
  - [http://support.sas.com/documentation/onlinedoc/hcm](http://support.sas.com/documentation/onlinedoc/hcm)
  - [http://support.sas.com/documentation/onlinedoc/stm](http://support.sas.com/documentation/onlinedoc/stm)

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**SAS BI Dashboard 4.2 (and Earlier) Migration Note**

This topic concerns SAS BI Dashboard 4.2 (and earlier) running on UNIX.

Before running the SAS Deployment Wizard, identify the SAS 9.2 common data directory. By default, the common data directory is located in the `Data` directory under the SAS configuration directory (for example, `/SAS/Config/Lev1/Data`). If the SAS
9.2 common data directory is not contained under your SAS 9.2 configuration directory, then be sure to choose the deployment wizard **Custom** prompting level.

When the wizard prompts for the Common Data Directory, enter the absolute path of your SAS 9.2 common data directory. You should also ensure that the 9.4 installer has Write permission to this location.

**Determine the Path to Database JDBC JAR Files**

The database required by the SAS Web Infrastructure Platform uses JDBC for communication. Determine the path to the database JDBC driver JAR files. During the installation and migration step, the SAS Deployment Wizard prompts you for them.

**Determine the User ID Associated with Scheduled Flows**

After migration, you will need to reschedule all of your SAS flows. (See “Server Tier Post-migration Tasks” on page 108.) To do this you will need to know the user ID under which each flow is scheduled to run.

Follow these steps to determine the user ID associated with scheduled flows:

1. Log on to Platform Flow Manager.
2. Select the **user ID** tab.
3. For each user ID, note the flows associated with it.

**Permission Considerations When User Accounts or Groups Change**

The SAS automated migration tools are shipped with scripts that are used to assign the proper permissions to files and directories under the SAS configuration directory. If you are using required operating system user accounts and group names in SAS 9.4 that are different from the ones on your current SAS system, then you must make sure that the permissions reflect these changes.

During configuration, the SAS Deployment Wizard invokes the levconfig extension (a part of the migration package) which converts certain temporary files into corresponding permission script files (*.bat and *.sh files). The deployment wizard persists these permission script files in the SAS 9.4 configuration directory (under **LevTemp**) and then invokes them during configuration.

You have to do one of the following procedures:

- **Before** running the SAS Deployment Wizard, do the following:
  
  Replace occurrences of a current SAS external user account (for example, “ebiadmin”) with the SAS 9.4 external user account (for example, “sasadm”) in the *.tmp files in the **levconfig\levconfig1** directory of the migration package (for example, /smu_package/host1.example.com/levconfig/levconfig1).

- **Or, after** running the SAS Deployment Wizard, do the following:

  Replace occurrences of a current SAS required external account with the SAS 9.4 required external account in the permission scripts residing in **SAS 9.4-configuration-directory\Temp**, and rerun these scripts.
Installing Third-Party Software

Overview of Installing Third-Party Software

In the pre-installation checklists that accompany your SAS 9.4 order, you are instructed to install required third-party software. The checklists point you to supplemental instructions for other third-party software. If your order contains alternate or supplemental instructions for certain products, these products are listed in product readme files found in your SAS Software Depot under install_doc/order-number/ReadmeFiles.

The following topics are contained in this section:

- “Install Third-Party Products Using the SAS Software Depot” on page 45
- “Install Third-Party Products Using the Software Website” on page 45
- “Moving Platform Suite for SAS Custom Calendars” on page 46

Install Third-Party Products Using the Software Website

SAS maintains a third-party software website 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 45. 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 “PowerShell” in SAS Intelligence Platform: Installation and Configuration Guide.

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 Website and download the JRE. Install it in the default location, and it will be ready for use when you install your SAS software.

Install Third-Party Products Using the SAS Software Depot

In the pre-installation checklists that accompany your SAS 9.4 order, you are instructed to install required third-party software. The checklists point you to supplemental instructions for other third-party software. If your order contains alternate or supplemental instructions for certain products, these products are listed in product readme files found in your SAS Software Depot under: install_doc/order-number/ReadmeFiles.

Some third-party products are shipped with SAS 9.4. Such products' installation files and documentation are located in the SAS Software Depot under the third_party directory.
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

**Note:** The recommendation is that you migrate the scheduling server and SAS sequentially and not try to migrate both SAS and Platform Process Manager in one step. For same-machine migrations, the recommendation for migrating Platform Process Manager installations is that you first move to version 7 on your current version of SAS before migrating to SAS 9.4. For new-machine migrations, the recommendation is that you install the latest version of Platform Process Manager on the new machine before migrating to SAS 9.4.

**Moving Platform Suite for SAS Custom Calendars**

If you install a version of Platform Suite for SAS on a different machine than the previous version was installed on, you must manually copy the Process Manager calendar metadata to the new location. The new machine must have access to the calendar files on the old machine (such as through FTP, SCP, or shared network storage).

To copy the calendar metadata, follow these steps:

1. Make sure that you have installed Platform Suite for SAS on the new machine.

   For more information, see “PowerShell” in SAS Intelligence Platform: Installation and Configuration Guide.

2. Log on to the old Process Manager machine.
3. Change to the calendar subdirectory that is directly under the work directory. For example:

- Windows:
  \cd C:\Program Files\Platform Computing\Platform Process Manager\work\calendar

- UNIX:
  \cd /opt/Platform Computing/Platform Process Manager/work/calendar

4. Copy all files except those ending in @sys to the corresponding calendar directory on the new machine.

---

Creating SAS Software Depots

Overview of Creating SAS Software Depots

The following topics are contained in this section:

- “About SAS Software Depots” on page 48
- “Benefits of a SAS Software Depot” on page 49
- “Best Practices for SAS Software Depots” on page 51
- “Prerequisites for Creating a SAS Software Depot” on page 52
- “Create a Depot By Using the SAS Download Manager” on page 53
- “Create a Depot By Using the SAS Deployment Wizard” on page 58

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.
  For more information, see “Create a Depot By Using the SAS Download Manager” on page 53.

- run the SAS Deployment Wizard.
  Creating SAS Software Depots is an option on one of the wizard pages.
  For more information, see “Create a Depot By Using the SAS Deployment Wizard” on page 58.

Before you create your depot, it can be helpful to understand exactly what a depot is, as well as a depot's benefits and the best practices for creating and maintaining a depot. For more information, see the following topics:

- “About SAS Software Depots” on page 48
- “Benefits of a SAS Software Depot” on page 49
- “Best Practices for SAS Software Depots” on page 51
- “Prerequisites for Creating a SAS Software Depot” on page 52
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 configure SAS. The depot contains the SAS Deployment Wizard executable, one or more deployment plans, SAS installation data files, order data, and product data.

Figure 3.4 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.
**Benefits of a SAS Software Depot**

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

For more information, see “Create a Disc Image of Your Order” in SAS Intelligence Platform: Installation and Configuration Guide.

Here are some other benefits of 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 9.4 can store SAS software installation files for more than one operating system, making the single, multi-system SAS 9.4 depot cumulatively smaller than the multiple, single-system depots in earlier SAS versions.

• saves download time.
  Because there is a shared copy of common files, the SAS 9.4 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 best practices around 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 9.4 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.

- **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 and applying future SAS hot fixes. As you get these 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.

  Before creating a depot, make sure that you have met the necessary requirements described in “Prerequisites for Creating a SAS Software Depot” on page 52.
**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 secure SAS download website. 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/index.html](http://support.sas.com/resources/thirdpartysupport/index.html).
  - a Windowing environment.
    
    If you will be creating the depot on a UNIX or a z/OS system, make sure that a windowing environment (such as the Common Desktop Environment or X11) is installed.


    **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 the *Configuration Guide for SAS Foundation for z/OS*, available at [http://support.sas.com/documentation/installcenter/en/ikfdtnmvscg/66194/PDF/default/config.pdf](http://support.sas.com/documentation/installcenter/en/ikfdtnmvscg/66194/PDF/default/config.pdf).

- 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, initial SAS installation data 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 and install the manager itself. The installer automatically launches the SAS Download Manager after installing it. Therefore, the following procedure actually consists of two logical sections:

1. downloading the SAS Download Manager
2. installing the SAS Download Manager


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 email sent by SAS. In this email, find the URL for the secure SAS website from which you will download the SAS Download Manager. Note: It is very important that you locate your original software order email 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 email, 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 52.

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 secure URL specified in your software order email.

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. If you want, you can 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 run the SAS Deployment Wizard to add or modify SAS order information details. For more information, see “Change Order Information” in SAS Intelligence Platform: Installation and Configuration Guide.

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” in SAS Intelligence Platform: Installation and Configuration Guide.
12. Specify a location where you want to download SAS and build the SAS Software Depot.

   For more information, see “Prerequisites for Creating a SAS Software Depot” on page 52.

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.

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.
The SAS Download Manager begins downloading, uncompressing, and creating a depot of your SAS order.

![SAS Download Manager](image)

When you see a page similar to the following with the progress indicator at 100%, the SAS Download Manager is finished:

![SAS Download Manager](image)
15. Click **Next** to go to the final page, which describes post-download instructions.

16. Click **Finish** to close the SAS Download Manager.

After you finish your SAS 9.4 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 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 or to apply future SAS 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.

2. Ensure that you have fulfilled the necessary requirements described in “Prerequisites for Creating a SAS Software Depot” on page 52.

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, depending on your operating system:

     Navigate to the depot's root directory and on:
     - 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**.

![SAS Deployment Wizard](image)

6. Confirm the list of SAS offerings contained in your order.

If you want, you can 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 run the SAS Deployment Wizard to add or modify SAS order information details. For more information, see “Change Order Information” in SAS Intelligence Platform: Installation and Configuration Guide.

7. If you have multiple orders in your depot, you must choose the order for which you want 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” in SAS Intelligence Platform: Installation and Configuration Guide.
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.)

For more information, see “Prerequisites for Creating a SAS Software Depot” on page 52.

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/66034/PDF/default/user.pdf](http://support.sas.com/documentation/installcenter/en/ikdeploywizug/66034/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/66034/PDF/default/user.pdf](http://support.sas.com/documentation/installcenter/en/ikdeploywizug/66034/PDF/default/user.pdf).

After you finish your SAS 9.4 deployment, be sure to keep your depot, as this will make applying maintenance and future upgrades easier.

---

**Create the Migration Package**

These packages contain all of the current SAS content—data and configuration—residing on a machine. Later in the migration process, the SAS Deployment Wizard uses these migration packages to populate your SAS 9.4 deployment.

In addition to creating migration analysis reports, the SAS Migration Utility creates migration packages. A migration package contains all of the current SAS content from your deployment. Migration utility output (see Figure 2.2 on page 23) consists of data and configuration that resides on each machine in your deployment. In a multi-machine environment, each time you run the migration utility, the utility adds the local machine’s SAS content to build one, multi-machine migration package. Later in the migration process, the SAS Deployment Wizard uses the migration package to populate your SAS 9.4 deployment.

**Note:** If you downloaded the SAS Migration Utility before receiving your SAS 9.4 order, you should now use the migration utility that is provided in your order. The version of the SAS Migration Utility that is included with your SAS 9.4 order is
guaranteed to be compatible with the versions of the SAS products that you have ordered.

To create a migration package, follow these steps:

**CAUTION:**

The migration utility pauses the metadata server when it creates a migration package, so any attempts to use your current SAS system during this period will be unsuccessful. Therefore, you should plan accordingly.

1. Review the migration utility requirements. (See “SAS Migration Utility Requirements” on page 22.)
2. Make sure that you have backed up your current SAS Metadata Repository. For more information, see “Back Up Your Current SAS System” on page 38.
3. If you have not already, complete a migration utility checklist. (See “Complete a Migration Utility Checklist” on page 19.)
4. Make sure that you have prepared your metadata repositories before you create a migration package on the metadata tier. (See “Prepare Your Metadata Repositories” on page 21.)
5. Verify that the current SAS Metadata Server is running.
6. If you have multiple machines in your SAS deployment, then you have to run the migration utility once on each machine. (Always run the migration utility on the metadata server first.)
7. If you are creating a migration package on a middle tier machine, verify that the following applications are running:

<table>
<thead>
<tr>
<th>SAS Middle-Tier Machine</th>
<th>Applications That Must Be Running</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS 9.2</td>
<td>SAS Shared Services database</td>
</tr>
<tr>
<td></td>
<td>By default, this database is the SAS Table Server. However, this database can also be a third-party database.</td>
</tr>
<tr>
<td></td>
<td>On JBoss Application Server systems, either all web applications are running or all are shut down. However, in order for the migration utility to copy the SAS Content Server content, the SAS Content Server must be stopped. To solve this dilemma, set the <code>SMU.scs.allow.sync</code> property to TRUE. This pauses the migration utility and gives you an opportunity to stop the JBoss Application Server and then restart it after the utility has copied the repository. On systems that use WebSphere and WebLogic web application servers, you can shut down the SAS Content Server only. For more information, see “Sample Migration Utility Properties File” on page 147.</td>
</tr>
<tr>
<td>SAS 9.3</td>
<td>SAS Web Infrastructure Platform database</td>
</tr>
<tr>
<td></td>
<td>In SAS 9.3, the SAS Infrastructure Platform and SAS Shared Services has been combined.</td>
</tr>
</tbody>
</table>
8. Log on to the current SAS machine (the *source* machine) whose SAS content you want to migrate.

*Note:* On SAS multiple machine deployments, run the migration utility *first* on the machine hosting the SAS Metadata Server.

9. If the version of the migration utility that you are using has changed from one that you have used previously, then be sure to delete the migration utility's output directory.

10. Change to the SAS Migration Utility executable directory. By default, this is the `smu-version` subdirectory under the `utilities` directory in your SAS Software Depot.

11. Review the section, “*smu Command Notes*” on page 141.

12. Use the common migration utility properties file and the common connection profile that you have developed, unless the source machine requires any special modifications.

   (For example, SAS is installed on a nonstandard path.)

   For more information, see “*Develop a Common SAS Migration Utility Properties File*” on page 24.

13. Add any necessary product-specific migration utility properties to your properties file. (See “*Review Product-Specific SAS Migration Utility Properties*” on page 26.)

14. If you have migration packages from any earlier migration utility invocations, delete or move these packages before rerunning the migration utility.

15. Invoke the migration utility on the machine with the metadata server, using the following command from an operating system prompt or command line that is appropriate for your version of SAS and your operating system.

   *Note:* On UNIX and z/OS, if you have not already, remember to assign file Execute permissions to `smu.sh` and `smu.zos` before attempting to run the migration utility.

   For more information, refer to your UNIX or z/OS documentation.

   If you have a multi-tier SAS deployment, you will need to run the migration utility once on each machine. (Do not run the migration utility on middle-tier cluster machines and machines that contain only SAS clients.) There are specific migration utility options, depending on the tier. For more information, see “*SAS Migration Utility Overview*” on page 135.

   *Note:* You cannot run the migration utility on more than one machine simultaneously, because the migration schema might be updated by more than one process at the same time.

   Use the `-replace` option if the migration utility writes to the output directory used in earlier invocations:

   SAS 9.2 on Windows 32-bit
   
   `smu92_32 -properties absolute pathname to property file -replace`
16. Review the migration analysis report to ensure that the migration package was properly created. Point a web browser to FullReport.html in the AnalysisReport subdirectory underneath the output directory that you specified in the migration utility properties file.

**Note:** Address any issues identified in your analysis report. Any errors or warnings might mean that your SAS deployment is unsuitable for migration. Consult http://support.sas.com/en/knowledge-base.html for SAS Notes pertaining to any specific warnings.

17. After you have created the migration package, make a backup of the package. Backups are especially recommended in multi-tier deployments. If the package
creation fails for one tier, you can restore the package to the last successful version, without having to rerun the migration utility on every tier again.

18. If you have a multi-tier SAS deployment, you will need to run the migration utility on each machine. (Do not run the migration utility on middle tier cluster machines and machines that contain only SAS clients.) There are specific migration utility options, depending on the tier. For more information, see “SAS Migration Utility Overview” on page 135.

Note: You cannot run the migration utility on more than one machine simultaneously, because the migration schema might be updated by more than one process at the same time.

Note: Later, the user ID under which the SAS Deployment Wizard runs must have Write permission for the SAS Content Server directories in the migration package on UNIX. For more information, see “Installer Permissions on the Content Server Migration Package on UNIX or Linux” on page 75.
Overview of Installing SAS and Migrating Your Content

This is the third of five tasks required to install SAS 9.4 and migrate your current SAS content:

- 1. Design your migration.
- 2. Perform pre-migration tasks.
- 3. Install SAS 9.4 and migrate your content from an earlier SAS release.
- 4. Perform post-migration tasks.
- 5. Validate your migration.
Preparing to Install and to Configure

Overview of Preparing to Install and to Configure

The following topics are contained in this section:

- “SAS Deployment Wizard Options” on page 70
- “About Deployment Plans” on page 70
- “SAS Deployment Agents” on page 71
- “Support for Certificate-Based Communication” on page 71
- “Metadata Server Clustering” on page 71
- “Changes After SAS 9.2 That Affect the Deployment Plan” on page 73
- “Installation Order Rules for Multiple Machine Deployments” on page 74
- SAS installation directory (SAS Home) considerations on page 78
- “Metadata Content Repository Considerations” on page 74
- “Installer Permissions on the Content Server Migration Package on UNIX or Linux” on page 75

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 and a deployment plan for its initial input, the wizard is designed to prompt the customer for all 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: Custom (all prompts), Typical (basic set of prompts), and Express (minimum set of prompts). For more information, see “Install and Migrate SAS Interactively” on page 75.

- 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 SAS 9.4 Client Installation across Multiple Machines” on page 103.

About Deployment Plans

A deployment plan describes the software to 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 stored by default 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 emailed to you.

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

- Your deployment plan must be a valid SAS 9.4 plan. The SAS Deployment Wizard does not accept plans from earlier SAS releases.

- The deployment plan that you use for installing SAS 9.4 must contain definitions for all of the SAS products that reside on your source system. (This is one reason why it is important to run the migration utility analysis report to determine what SAS products currently reside on your source system.)

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 (under `utilities`) and inserts a date and time stamp to the deployment plan filename. For example:

C:\SAS\Config\Lev1\Utilities\plan.2013-05-23-00.43.xml

To download the latest SAS 9.4 standard deployment plans, go to http://support.sas.com/installcenter/plans.

If you do not have the deployment plans from your previous SAS deployments, the migration utility analysis report can help you determine the SAS products configured in your current SAS deployment. For more information, see Figure 2.5 on page 30.

**SAS Deployment Agents**

The SAS Deployment Agent and its remote clients are required for deployments that run remote processes. SAS uses the SAS Deployment Agent to copy content and to perform configuration management operations associated with creating new servers and clustering. It is also used for server administration tasks such as deployment backups.

**Support for Certificate-Based Communication**

In SAS 9.4, the SAS Deployment Wizard prompts for Transport Security Layer, certificate-based communication. For more information, refer to *SAS Intelligence Platform: Middle-Tier Administration Guide*.

**Metadata Server Clustering**

A metadata server cluster is a group of three or more host machines (nodes) that have been configured as identical metadata servers. Each node runs its own server process, and has its own server configuration information, journal file, and copy of the repository data sets. In addition, each node maintains a complete in-memory copy of the SAS Metadata Repository. The nodes work together as if they were a single metadata server.
Note: If you are configuring metadata server clustering, and if your server tier or middle tier includes one or more Windows hosts, then the SAS Deployment Wizard should prompt you for the SAS Deployment Backup and Recovery Tool: User Account. This external account, also referred to as the backup user, is used to run the SAS Deployment Backup and Recovery Tool. The account must meet the requirements that are specified in “What Is a Backup User?” in *SAS Intelligence Platform: System Administration Guide*. If this prompt does not appear, then you must configure the user manually after the deployment is completed. For instructions, see “Specifying a Backup User Manually” in *SAS Intelligence Platform: System Administration Guide*.

Clustering provides redundancy and high availability of the SAS Metadata Server.

Client applications and users interact with the cluster in the same way that they would interact with a SAS Metadata Server that is not clustered. A load-balancing process automatically distributes work among the nodes. If a node ceases to operate, the metadata server continues to be available using the remaining nodes.

On Windows, you need an external, Windows domain-based user account that will start all of the nodes. The suggested user ID for this service login is `myWindowsDomain\sassv1gn`. On UNIX and z/OS, the nodes are started by the Installer account. For more information, see “Prerequisites for Cluster Configuration” in *SAS Intelligence Platform: System Administration Guide*.

All of the nodes in the metadata server cluster must be on the same operating system.

You deploy your metadata server cluster by installing an initial SAS Metadata Server, and then moving to another machine and running the SAS Deployment Wizard to deploy a metadata server node. You indicate which type of metadata server you want to deploy by choosing the appropriate step on the deployment wizard’s Select Deployment Step and Products to Install page.

*Figure 4.1* Select Deployment Step and Products to Install Page

For more information, see “Using Metadata Server Clustering” in *SAS Intelligence Platform: System Administration Guide*.
**Changes After SAS 9.2 That Affect the Deployment Plan**

When you work with your SAS representative to develop a custom deployment plan, or if you are choosing among the standard deployment plans available to you in your SAS 9.4 Software Depot, remember that there have been some deployment plan changes between SAS 9.2 and SAS 9.4. The following table enumerates these changes:

<table>
<thead>
<tr>
<th>After SAS 9.2</th>
<th>In SAS 9.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS Web Infrastructure Kit is included.</td>
<td>The SAS Web Infrastructure Kit has been replaced by the SAS Web Infrastructure Platform.</td>
</tr>
<tr>
<td>A separate deployment plan entry is required for SAS Foundation Services Manager.</td>
<td>No separate entry is required for SAS Foundation Services Manager (part of SAS Management Console).</td>
</tr>
<tr>
<td>SAS Query and Reporting Services and SAS Reporting Services are included.</td>
<td>These components are replaced with SAS BI Reporting Services.</td>
</tr>
<tr>
<td>By default, certain deployment plans contain both SAS Web Report Studio and SAS Web Report Viewer.</td>
<td>By default, certain deployment plans contain SAS Web Report Studio only.</td>
</tr>
<tr>
<td>The Java Runtime Environment (JRE) is required in deployment plans.</td>
<td>The JRE is no longer included in deployment plans.</td>
</tr>
</tbody>
</table>
| SAS Add-In for Microsoft Office is optional in deployment plans (when part of the order). | SAS Add-In for Microsoft Office is required in deployment plans (when part of the order).  
*Note:* In the SAS Deployment Wizard, you can deselect SAS Add-In for Microsoft Office to avoid errors when deploying on machines without Microsoft Office. |
<p>| SAS Deployment Tester is optional in deployment plans. | SAS Deployment Tester is required in deployment plans. |
| SAS 9.2 Web OLAP Viewer for Java is included.       | This functionality is added to SAS Web Report Studio in SAS 9.3. |
| SAS Distributed In-Process Scheduler is not available. | SAS Distributed In-Process Scheduler is new in SAS 9.3. |</p>
<table>
<thead>
<tr>
<th>After SAS 9.2</th>
<th>In SAS 9.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS Shared Services is included.</td>
<td>SAS Shared Services is a part of the SAS Web Infrastructure Platform in SAS 9.3.</td>
</tr>
<tr>
<td>SAS Online Doc for the Web is included.</td>
<td>SAS Online Doc for the Web is canceled in SAS 9.3.</td>
</tr>
<tr>
<td>Windows 32-bit SAS middle tier is included.</td>
<td>The SAS middle tier is supported on 64-bit systems only for SAS 9.3 and later.</td>
</tr>
<tr>
<td>SAS Visual Data Explorer is deprecated in the second maintenance release of SAS 9.3.</td>
<td>The migration utility converts data explorations to reports that are viewable in SAS Web Report Studio 4.3. Data explorations with more than one bookmark are converted to multiple reports.</td>
</tr>
<tr>
<td>SAS Deployment Agent is not available.</td>
<td>SAS Deployment Agent is new in SAS 9.4.</td>
</tr>
<tr>
<td>SAS Environment Manager Server and Agent is not available.</td>
<td>SAS Environment Manager Server and Agent is new in SAS 9.4.</td>
</tr>
<tr>
<td>Third-party web application servers are required in SAS 9.3 and earlier.</td>
<td>SAS Web Server and SAS Web Application Server are new in SAS 9.4.</td>
</tr>
</tbody>
</table>

### 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:

1. Always install SAS software on the metadata server machine first.

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

3. If your deployment plan separates SAS Web Server from SAS Web Application Server, install SAS Web Server first.

4. 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.

5. Install the middle tier.

6. If you are implementing metadata server clusters, install the metadata server nodes next. (Do not select the Perform migration check box in the deployment wizard.)

7. If you are implementing SAS Web Application Server clusters, install the application server nodes next. (Do not select the Perform migration in the deployment wizard.)

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

### Metadata Content Repository Considerations

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 SAS Intelligence Platform: System Administration Guide.

Installer Permissions on the Content Server Migration Package on UNIX or Linux

The user ID under which the SAS Deployment Wizard runs must have Write permission for the SAS Content Server directories in the migration package on UNIX or Linux. Before running the deployment wizard, be sure to change the owner of the SCS directory and its child directories to the Installer user account, using the following command:

```
chown $USER -R root-directory-migration-package/SCS
```

Install and Migrate SAS Interactively

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

- Providing installation information such as the following:
  - deployment plan location
  - machine type (metadata server 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 migration and configuration information such as the following:
  - migration package location
  - prompting level
  - configuration directory name
  - required user account credentials

This topic describes some of the more important configuration dialog boxes that you will encounter during the migration and configuration phase of a SAS 9.4 deployment. The type and number of configuration-related dialog boxes that you will see depend on the prompt level that you choose, the SAS tier that you are currently migrating, and the contents of your SAS 9.4 custom order. For information about all SAS Deployment Wizard prompts, see the online Help for the wizard page in question.

Note: 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/66034/PDF/default/user.pdf.

Note: You might be prompted more than once for a SAS Application Server Context. You should never select SASMeta even if it is selected by default. Be sure to change it to the appropriate application server context name.

To migrate and configure SAS interactively, follow these steps:

1. If you are using HTTPS self-signed or site-signed certificates, you must deploy SAS Intelligence Platform in the following manner:
   a. Install SAS Intelligence Platform and the new trusted CA bundle.
Run the deployment wizard in install-only mode.

b. Add your self-signed and site-signed certificates to the trusted CA bundle. Use the trusted CA bundle tasks in the SAS Deployment Manager.

c. Configure SAS Intelligence Platform.

Run the deployment wizard in configure-only mode.

d. Repeat these steps on each machine in your deployment. This means that you must add certificates to the trusted CA bundle on each and every machine.

For more information, see SAS Intelligence Platform: Middle-Tier Administration Guide.

2. Make sure that you have reviewed the SAS system requirements available at http://support.sas.com/resources/sysreq/index.html. The SAS Deployment Wizard checks the version of the operating system and will not proceed if the correct patch level is not met.

3. Verify that you have performed the earlier required steps outlined in “Overview of Installing SAS and Migrating Your Content” on page 69.

   Note: A few pages into the SAS installation, the SAS Deployment Wizard might prompt you for paths to the requested third-party software. You must install the necessary third-party software on the current machine, or the SAS Deployment Wizard might 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.

4. 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.

5. Make sure that you have no SASMeta SAS Application Server components in the SAS deployment that you are migrating. For more information, see “Prohibition on SASMeta Server Components” on page 18.

6. Ensure that you have the list of required user IDs available. For more information, see “Completing the Pre-migration Checklists” on page 39.

7. If your migration package resides on UNIX or Linux and contains SAS Content Server content, be sure to change the owner of the SCS directory and its child directories to the Installer user account.

   For more information, see “Installer Permissions on the Content Server Migration Package on UNIX or Linux” on page 75.

8. If you are deploying a middle-tier machine, make sure that you have read and understood the information in “Middle-Tier Considerations” on page 31.

9. Review information about where to source your SAS metadata repositories described in “Metadata Content Repository Considerations” on page 74.

10. Review information about SAS Deployment Wizard configuration prompting levels.

11. 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 74.

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

   • Windows
We recommend that you use the same account that was used to deploy your current SAS version. This account must be a member of the Administrators group.

- UNIX
  
  We recommend that you use the same account that was used to deploy your current SAS version. Do not use root.

- z/OS
  
  We recommend that you use the same account that was used to deploy your current SAS version.

13. Unless you plan to use different ports for the SAS servers to which you are migrating, make sure that the SAS servers are not running on the machine on which you are currently migrating.

- Windows
  
  Use the Windows Services snap-in to stop your current SAS servers. For more information, see your Windows documentation.

- UNIX and z/OS
  
  Use the server scripts to stop your current SAS servers. These scripts reside in the SAS configuration directory under the SAS Application Server directory for the respective server. For example:

  ```
  /opt/config/Lev1/SASMeta/MetadataServer/MetadataServer.sh -stop
  ```

  **Note:** If you are migrating on the same machine, make sure that there are no SAS 9.4 servers running when you are re-running the deployment wizard to address configuration errors. On UNIX and z/OS, you can run the following command: `./sas.servers status`. If any SAS 9.4 servers are running, shut them down with the following command: `./sas.servers stop`. Make sure that all servers are stopped. In SAS 9.4, some servers are not stopped by this script.

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

   **Table 4.2** Start Up Commands for the SAS Deployment Wizard

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td><code>setup.exe -record -deploy</code></td>
</tr>
<tr>
<td>UNIX</td>
<td><code>setup.sh -record -deploy</code></td>
</tr>
<tr>
<td>z/OS</td>
<td><code>setup.rexx -record -deploy</code></td>
</tr>
</tbody>
</table>

   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 specified. 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 screen similar to the following:

![SAS Deployment Wizard](image)

15. **Choose Language**

   Select the language for the deployment wizard, and click **OK**.
   - From the drop-down list, select the language that you want the deployment wizard to use when it displays text.

16. **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. When you are finished, click **Next**.**

17. **Select Deployment Task**

   Select the deployment task that you want to perform, and click **Next**.
   - Select **Install SAS Software**.

18. **Specify SAS Home**

   Specify the location where you want to install SAS, and click **Next**.
   - If you want to specify a different location other than the default, enter the location in **SAS Home**. Click **Next**.

**CAUTION:**

The directory path for the SAS installation directory (SAS Home) cannot contain parentheses. Using parentheses causes SAS Environment Manager scripts to fail.

**Note:** Sharing the same SAS installation directory that is used by previous SAS versions is not supported in SAS 9.4.

Although your SAS installation directory (which the wizard refers to as SAS Home) and SAS configuration directories can share the same parent directory, one directory cannot reside inside another. Also, the SAS installation directory should not be a directory within your SAS Software Depot.

**CAUTION:**

There should be one SAS installation directory (SAS Home) per SAS deployment. Therefore, when deploying multiple tiers on the same machine, the SAS installation directory should always be shared. By contrast, when
deploying different versions of SAS on the same machine, there should be a unique SAS installation directory for each SAS version.

Note: On Windows, the deployment wizard prompts you for the SAS installation directory (SAS Home) the first time you run the wizard. In any subsequent wizard sessions on the same machine, the wizard uses the previously specified location for SAS Home.

19. Select Deployment Type

Specify the type of deployment that you want to perform. Click Next.

- Confirm that Perform a Planned Deployment, Install SAS Software, and Configure SAS Software are all selected unless you are providing your own TLS certificates.

Note: If you are migrating on a middle-tier machine and you are providing your own TLS certificates, you must run the deployment wizard in install-only mode. For more information, see SAS Intelligence Platform: Middle-Tier Administration Guide.

20. Specify Deployment Plan

Specify the type of deployment plan that you are using, and click Next.

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

- standard deployment plan
  Select Select a standard deployment plan and the appropriate plan in the drop-down menu.

For more information, see “About Deployment Plans” on page 70.

21. Select Deployment Step and Products to Install
Select the machine on which you are installing software, and select the SAS products that you want to install. When you are finished, click Next.

- From the Deployment Step drop-down menu, select the machine on which you are installing software.

  *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” in *SAS Intelligence Platform: Installation and Configuration Guide*.

  *Note:* When a machine has multiple deployment steps, the deployment wizard attempts to default to the correct step. 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.

  For information about SAS Web Parts for Microsoft SharePoint, see “Deploying SAS Web Parts for Microsoft SharePoint” in *SAS Intelligence Platform: Installation and Configuration Guide*.

- All products in the table are installed by default. Deselect any products that you do not want to install. When you are finished, click Next.

  *Note:* Included in your SAS 9.4 order are procedures that enable you to take advantage of additional functionality that is provided by SAS Viya. You must have a SAS Viya license to use the OPTNETWORK procedure and the procedures for these products:

  - SAS Visual Data Mining and Machine Learning
  - SAS Visual Statistics
  - SAS Econometrics
  - SAS Visual Forecasting

  *Note:* If you are deploying a middle-tier node machine, make sure that SAS Web Application Server is selected.

  *Note:* If you are deploying a SAS Data Management product, you should select a SAS Quality Knowledge Base product.
22. Select SAS Foundation Mode

Specify which mode of SAS Foundation to install, and click Next.

- You see this page when you are installing on a 64-bit machine and your order contains software for both 32-bit and 64-bit machines.
- Select 64-bit Native Mode to take full advantage of your 64-bit machine and the additional functionality provided by SAS Viya.
- Select 32-bit Compatibility Mode if you are concerned about compatibility with 32-bit software that you have installed or might eventually install.

23. Select SAS Enterprise Guide Mode

Specify which mode of SAS Enterprise Guide to install, and click Next.

- You see this page when you are installing on a 64-bit machine and your order contains software for both 32-bit and 64-bit machines.
- Select 64-bit Native Mode to take full advantage of your 64-bit machine.
- Select 32-bit Compatibility Mode if you are concerned about compatibility with 32-bit software that you have installed or might eventually install.
  
  Note: 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 is installed also.

24. Select SAS Add-in for Microsoft Office Mode

(Windows only) Specify which mode of SAS Add-In for Microsoft Office to install, and click Next. (This page appears when the deployment wizard is unable to detect the bit capacity of Microsoft Office.)

- Select 32-bit Compatibility Mode if you are running 32-bit Microsoft Office.
  
  Note: The bit capacity of SAS Add-In for Microsoft Office must match the bit capacity of Microsoft Office.
- Select 64-bit Native Mode if you are running 64-bit Microsoft Office.
25. Specify SAS Installation Data File

Specify the path to your SAS installation data file, and click Next.

- Click Browse and locate your SAS installation data file.

The SAS installation data file contains information about the software that you have licensed for the current machine.

**CAUTION:**

Be careful to use the correct SAS 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. For multiple machine deployments, during the clients step, choose the SAS installation data file for the server machine that is associated with the clients being installed.

26. Select Language Support

Select the languages for your SAS software to support, and click Next.

- Add additional languages that you want SAS software to support.

By default, SAS attempts to support all languages for which your machine’s operating system is configured.

27. Select Regional Settings

Select the language, region, and locale setting that affect how SAS displays text, numbers, currencies, dates, and times, and specify how SAS sorts data. Click Next.

- Accept the default value of English (United States) or select a different language, region, and locale in Language (Region) [Locale].

- Select Configure as a Unicode server if you want to configure SAS as a Unicode server.

For more information, see “Locale and Encoding Considerations” in SAS Intelligence Platform: Installation and Configuration Guide.

28. Select Authentication Type

- Select Use PAM Authentication if your system uses pluggable authentication modules (PAM).

In addition, you might need to update your PAM configuration files for SAS 9.4 to use PAM authentication. For more information, see the Configuration Guide for SAS Foundation for UNIX Environments.

If you are uncertain whether your system uses PAM for authentication, contact your system administrator.

**Note:** Do not select PAM authentication if you know that your system uses /etc/password or /etc/shadow authentication.

29. Default Product for SAS Filetypes

(Windows only) Indicate the SAS product that your system will use by default to open SAS file types (.sas, .sas7bdat, and so on) that are shared by more than one product. Click Next.

- Select SAS Foundation as the SAS program that will launch and open SAS files by default when you double-click the file in Windows Explorer.

- Select SAS Enterprise Guide as the SAS program that will launch and open SAS files by default when you double-click the file in Windows Explorer.
30. Select Microsoft Office Applications

(Windows only) Choose the Microsoft Office applications for which you want the SAS Add-In for Microsoft Office activated, and click Next.

- When the Microsoft Office application is launched, it automatically activates SAS Add-In for Microsoft Office. A user sees either a SAS tab on the ribbon (Microsoft Office 2007, 2010, and 2013) 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.

31. SAS Environments URL

Specify the URL for the file that defines SAS environments, and click Next.

- In SAS Environments URL, enter the URL for the file that defines SAS environments.

The SAS environment file, named sas-environment.xml, specifies a set of SAS deployments at your site. Your administrator makes this file available on your site’s network and can provide you with its URL. To log on to some client applications, the URL must be specified in this dialog box. If the URL is not known at this time, you can continue and provide the URL later.

If you use SAS Web Server, then the URL should resemble protocol: //hostname:port/sas/sas-environment.xml, where hostname is the fully qualified host name of your machine and port is the default port for SAS Web Server. (For an unsecure port, use 80 on Windows and 7980 on UNIX. For a secure port, use 443 on Windows and 8343 on UNIX.)

If you use a different web server or no web server, leave this field blank. Follow the instructions for the sas-environment.xml file in the Instructions.html document created by the SAS Deployment Wizard after your configuration is completed to find the file and deploy it on your web server.

For more information, see “Configure the SAS Environment File” in SAS Intelligence Platform: Middle-Tier Administration Guide.

32. Specify Remote Communication Configuration

Specify the configuration for communication with the SAS Deployment Agent, and click Next.

- In Specify how to secure the remote connection, choose one of the following selections:
  - Select Generate credentials to secure the connection if you want the deployment wizard to create a self-signed certificate, generate a keystore, and import the certificate into the keystore.
  - Select Specify existing credentials to secure the connection if you have already implemented CA-signed, site-signed, or self-signed certificates. On the next page, the wizard prompts you for the keystore location and password.
  - Select Do not secure the connection if you do not want to secure SAS Deployment Agent communication or you have not yet implemented certificates.

You can set up certificates later on your own or by using the SAS Deployment Manager. Do not start the SAS Deployment Agent until you have completed the manual security configuration.
For more information, see *SAS Intelligence Platform: Middle-Tier Administration Guide*.

33. Checking System

The deployment wizard scans your machine to determine whether any SAS files are locked or do not have Write permission. If no action is required, click **Next**.

- If the wizard lists any files in the text box, then while the wizard is still running, quit SAS, and add Write permission to each file listed. When you are finished, click **Next**.

34. *(z/OS only)* Provide input for the following prompts, and click **Next**:


- **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 specify 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.

- **Media Type**
  Select the check box if installing from cartridge tape media. Leave the check box deselected if you are installing from a DVD or from the internet.

- **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 in 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.

35. 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, and click **Next**.

   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/94](http://support.sas.com/documentation/installcenter/94), and use the operating system and SAS version to locate the appropriate SAS Foundation Configuration Guide.

36. Review Required Software

   Review the list of third-party software that is required for the SAS software that you are installing on the current machine, and click **Next**. (The list depends on the SAS software that you are installing.)

   - On the subsequent pages, be prepared to provide paths to these third-party applications. The number of wizard pages varies depending on the SAS software that you are installing on the current machine.

     **Note:** You must provide valid paths to the third-party applications or the SAS Deployment Wizard will not let you continue with the installation.

     For more information, see the following resources:

     [Third-Party Software for SAS 9.4](#)

37. Specify Software Location
Specify the installation directory for the required software, and click Next.

- In the field, enter the installation directory for the required third-party software.

38. Select Configuration Prompting Level

Specify the amount of information that you want to configure by selecting one of three prompting levels. Click Next.

- **Express**
  
  Displays the minimum set of wizard pages needed to complete the SAS configuration.

  *Note:* When deploying the SAS middle tier, the SAS Deployment Wizard automatically configures your SAS Web Application Server. To disable this feature, run the wizard using either the Typical or Custom prompting level. Manually configuring your SAS middle tier is an advanced task and requires using other documents such as your Instructions.html file.

- **Typical**
  
  Displays the basic set of wizard pages needed to complete the SAS configuration.

- **Custom**
  
  Displays all the wizard pages to complete the SAS configuration.

39. Specify Configuration Information

Specify the directory for SAS configuration files and logs. Select a configuration level. Click Next.

- In **Configuration Directory**, select the directory for SAS configuration files and logs.

  In UNIX environments, the 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.

- In **Configuration Level**, select the configuration level (for example, Lev1 indicates production).

  *Note:* The last digit of the default port number reflects the configuration level. For example, when you select Lev1, the default port for the SAS Metadata Server is 8561. If you select another level, such as Lev2, the wizard changes the default port to 8562.

  For more information, see “Overview of the Configuration Directory Structure” in *SAS Intelligence Platform: System Administration Guide*.

  *Note:* Although your SAS installation directory and SAS configuration directory can share the same parent directory, one directory should not reside inside another. Specifying the configuration directory under the SAS installation directory or vice versa can lead to file permission issues because of the need to manage installed files differently from site-specific configurations.

40. Local Machine Name

Identify the local machine. Click Next.

- In **Fully-qualified Local Host Name**, enter the complete name of the local host.

  The fully qualified local host name typically takes the form of the local host name plus the domain name server (for example, MyMachine.example.com).
Note: As noted in RFC 952, underscores and whitespace characters are not allowed in host names.

**TIP**  If you do not know the domain name server used at your site, check with your system administrator.

- In **Short Local Host Name**, enter a short host name.

  The short local host name is the abbreviated, more common name of the host, usually a single word (for example, MyMachine).

41. **Migration Information**

Specify whether to perform migration. Specify the path to the migration package. Click **Next**.

- Select **Perform migration** if you are migrating to SAS 9.4.

  **Note:** You can ignore this page unless you are migrating.

  For more information, see Chapter 1, “Introduction,” on page 1.

- In **SAS Migration Utility Package Directory**, enter an absolute path to the migration package that you created with the SAS Migration Utility.

  This path should include the top level directory of the migration package (for example: `C:\SMU\93_Deployment`). (This path should match the value of the SMU.Output.Dir property.)

  **Note:** During installation of additional SAS Metadata Server nodes, the SAS Deployment Wizard prompts for a migration. Ignore this prompt. Migration is supported only on the primary SAS Metadata Server node.

  **CAUTION:**
  
  The **Perform migration** check box should not be selected if you are running the SAS Deployment Wizard on any middle-tier node machines or client-tier machines. The **Perform migration** check box should be selected only when there is content available in the migration package for the current machine.

42. If you are performing a multiple machine deployment, and are migrating a machine other than the metadata server, the wizard prompts you to select the machine to migrate. Click **Next**.

  **Note:** If you have already deployed the metadata tier and you have only a total of two tiers, the deployment wizard automatically selects the remaining tier for you.

43. **Remap Ports**

Review the list of ports for the SAS products being migrated. Click **Next**.

- The deployment wizard displays the port being used in your current SAS deployment (**Port from Source** column). To specify a different port to use for SAS 9.4, click the **Port for Target** cell in the appropriate row for the SAS product instance. Enter the new port number.

  By default, the deployment wizard assumes that ports used in your current SAS deployment are identical to the ports used in your SAS 9.4 deployment. Use this page if you want to specify different ports in your SAS 9.4 deployment.

44. Provide the remaining migration and 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 migration and configuration phase of a SAS 9.4 deployment. The options for which the SAS Deployment Wizard prompts you depend on which SAS products are identified in your deployment plan and, in
multiple machine deployments, which machine you are currently deploying. For information about all SAS Deployment Wizard prompts, see the online Help for the wizard page in question.

Authentication Domain
Specify the authentication domain that SAS uses to authenticate logins to servers. Click Next.

• Accept the default value (DefaultAuth) unless you are planning to use a different authentication domain for servers on this machine. For example, if the SAS Metadata Server is on Windows and the SAS Workspace Server is on UNIX, the workspace server might be assigned to a SAS authentication domain named UNIXAuth.

  Note: Authentication domain assignments from the original deployment are always preserved. This prompt affects only new servers that are introduced in the SAS that you are configuring.

  For more information, see “Manage Authentication Domains” in SAS Management Console: Guide to Users and Permissions.

SAS Metadata Server: Override Backup Location
Specify a different location for the SAS Metadata Server backup directory, if necessary. Click Next.

• If you want to change the location of the SAS Metadata Server backup directory, select Override the default SAS Metadata Server backup directory.

  When configuring a metadata server cluster, you must specify a network file system path accessible to all nodes in the cluster.

  For more information, see “Backing Up and Recovering the SAS Metadata Server” in SAS Intelligence Platform: System Administration Guide.

SAS Metadata Server: Repository Configuration
Specify the name and location of the metadata repositories and foundation repository. Click Next.

• SAS Metadata Server Configuration Directory is Read-only. It identifies the parent directory under which the metadata repositories and foundation repository reside.

  After deployment, you should apply appropriate operating system security on this directory. For more information, see “First-Priority Setup Tasks” on page 122.

• In Metadata Repository Root Directory, enter the location of the metadata repositories. This location must be specified as a path relative to the SAS Metadata Server Configuration Directory. Each metadata repository created during configuration is a subdirectory in this location. Do not use special characters (for example, hyphens, underscores, and so on). Use characters appropriate for an operating system subdirectory name. On UNIX, avoid shell characters that might cause unintended side effects.

• In Foundation Repository Name, enter the name of the foundation repository and the name of the subdirectory (relative to the Metadata Repository Root Directory) in which the foundation repository is located. The maximum number of characters in the name is 60. Do not use special characters (for example, hyphens, underscores, and so on). Use characters appropriate for an operating system subdirectory name. On UNIX, avoid shell characters that might cause unintended side effects.
SAS Metadata Server: Override Service Login Account
Specify whether you want to use a different service login account for the SAS Metadata Server. Click Next.

- If you want to change the service login account for the SAS Metadata Server, select Specify the service login account for the SAS Metadata Server. The LocalSystem account is the default Windows service login account for the SAS Metadata Server.

  When configuring a metadata server cluster on Windows, you must specify the external user account that is used to start the SAS Metadata Server. This user account must be the same account that you specify to start the other nodes. The deployment wizard automatically grants the Log on as a service Windows user right if the user account does not already have it.

  For more information, see “Back up and Recovering the SAS Metadata Server” in SAS Intelligence Platform: System Administration Guide.

Deployment Accounts: Type of Accounts
Select the type of accounts to use for initial deployment SAS identities. Click Next.

- Select Use SAS internal accounts when appropriate for SAS to use accounts known only to SAS. Or, select Use external accounts for all identities.

  If you selected internal accounts, SAS creates and authenticates internal accounts in metadata rather than using an operating system account.

  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” in SAS Intelligence Platform: Installation and Configuration Guide.

External Account: Installer
Specify the operating system account (external account) used to initialize the SAS Metadata Server. Click Next.

- In External User ID, enter the user ID for the external account that you are using 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. It must be a member of the Windows 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.

- In External Password, enter the password for the user ID.

  For more information, see “Defining User Accounts” in SAS Intelligence Platform: Installation and Configuration Guide.
SAS Internal Account: Unrestricted Administrator

Enter the password for the first unrestricted administrator identity. Click Next.

- In **New Internal Password**, enter a password for the internal account (sasadm@saspw) that the wizard creates to serve as an unrestricted administrator for configuring the SAS Metadata Server.

  **Note:** Record this password because you will need it in the future.

- In **Confirm New Internal Password**, re-enter the password. Click Next.

  For more information, see “Defining User Accounts” in *SAS Intelligence Platform: Installation and Configuration Guide*.

- Select **Set passwords using the Unrestricted Administrator password** if you want to reuse this password for the internal SAS Metadata Server accounts and SAS Web Infrastructure Platform Data Server accounts during this deployment. Selecting this option when running the deployment wizard with the Express prompting level reduces the number of configuration prompts.

  **Note:** There are password restrictions for SAS Web Infrastructure Platform Data Server. Make sure that your password meets the criteria described in “SAS Web Infrastructure Platform Data Server” in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

SAS Internal Account: Trusted User

Specify the password for the SAS Trusted User identity. Click Next.

- In **New Internal Password**, enter a password for the internal account (sastrust@saspw) that the wizard creates to enable SAS server and spawner components to communicate securely with each other.

  **Note:** Record this password because you will need it in the future.

- In **Confirm New Internal Password**, re-enter the password. Click Next.

  For more information, see “Defining User Accounts” in *SAS Intelligence Platform: Installation and Configuration Guide*.

SAS BI Web Services: Authentication Method

Select the method by which users of SAS BI Web Services are authenticated. Click Next.

- In **Authentication Method**, make a selection.
  
  - **SAS Authentication** is managed by the SAS Metadata Server.
  
  - **Web Authentication** is managed by the SAS Web Application Server using container-based authentication or a third-party product.

Selecting **Web Authentication** has these effects:

- Web authentication for SAS BI Web Services for Java is partially configured. For more information, see “Secure SAS BI Web Services for Java” in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

- There is no effect on BI web applications (such as SAS Web Report Studio, SAS Information Delivery Portal, and so on). You have to configure web authentication for these BI web applications.

- Web authentication prevents you from setting up an anonymous web user (as this is incompatible with web authentication).
Anonymous Web Access
When using SAS authentication, select this option to set up a SAS identity for anonymous access to certain web services and web applications that support this feature. Click **Next**.

- Select **Enable anonymous web access** to set up a SAS identity for anonymous access to certain web services and web applications that support this feature.

  SAS BI Web Services for Java and .NET, the SAS Stored Process Web Application, and SAS Visual Analytics Guest Access are the only components that support this feature.

  For more information, see “PUBLIC Access and Anonymous Access” in *SAS Intelligence Platform: Security Administration Guide*.

SAS Internal Account: Anonymous Web User
Enter the password for the anonymous web user identity. Click **Next**.

- In **New Internal Password**, enter a password for the internal SAS account that the wizard uses to grant clients access to applicable SAS Web Infrastructure Platform applications such as SAS BI Web Services and the SAS Stored Process Web Application.

  When SAS authentication is being used and the user has not preemptively specified credentials, the client is given access to these applications under the anonymous web user identity.

  For more information, see “Use the SAS Anonymous Web User with SAS Authentication” in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

  **Note:** Record this password because you will need it in the future.

- In **Confirm New Internal Password**, re-enter the password. Click **Next**.

External Account: SAS Spawned Servers Account
Specify the credentials used to launch the back-end SAS Stored Process Server and SAS Pooled Workspace Server. Click **Next**.

- In **External User ID**, enter the user ID to start the SAS Pooled Workspace Server and the SAS Stored Process Server.

  **Note:** On Windows, enter a domain-qualified user ID.

- In **External Password**, enter the password for the external user ID.

  **Note:** Record this password because you will need it in the future.

  For more information, see “Defining User Accounts” in *SAS Intelligence Platform: Installation and Configuration Guide*.

Client-side Credentials Policy
Specify whether users are allowed client-side storage of credentials. Click **Next**.

- Select **Allow users to save credentials in client-side connection profiles** to allow users to save their user IDs and passwords in client-side connection profiles.

  When this option is selected, SAS enables the OMA_SASSEC_LOCAL_PW_SAVE option in the omaconfig.xml file.

  For more information, see “Reference Information for omaconfig.xml” in *SAS Intelligence Platform: System Administration Guide*. 
Estimated System Size

Estimate the size of your system based on user number and workload size. Click Next.

- In Size Estimate, select Small System, Medium System, or Large System.

  The wizard uses your sizing estimate as a tuning hint during SAS server configuration. This option appears only during SAS Metadata Server configuration and it applies to all machines configured with this metadata server.

  You might have to further refine individual tuning parameters after you have collected and evaluated system usage information.

  For more information, see SAS Web Applications: Tuning for Performance and Scalability.

E-mail Server

Specify email server information. Click Next.

- In Host Name, enter the host name for an SMTP email server at your site. SAS uses this server to send alerts for system-related issues to an administrator (for example, the SAS Metadata Server detects a journaling issue).

  The wizard uses this email server as the default for the application server to provide email 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. For the SAS BI Dashboard to send alerts by email to dashboard users and administrators, the port and host name must be configured for the email server.

- In Port, enter the port that the SMTP email server uses.

SAS Web Infrastructure Platform Data Server

Specify SAS Web Infrastructure Platform Data Server information. Click Next.

- In Host Name, enter the fully qualified host name of the SAS Web Infrastructure Platform Data Server. Or, accept the default value.

  The default value is the host name where the deployment wizard is currently running. In most cases, the default value is correct. However, a machine can have more than one network interface card (NIC) or host name alias. If so, see your Pre-installation Checklist to determine whether the default value is correct.

- In Port, enter the TCP/IP port number on which SAS Web Infrastructure Platform Data Server listens. Or, accept the default value.

- In Data Administrator, enter the user ID for the user administring SAS Web Infrastructure Platform Data Server.

- In Data Administrator Password, enter the password for the user ID associated with the SAS Web Infrastructure Platform Data Server administrator.

  Note: There are password restrictions for SAS Web Infrastructure Platform Data Server. Make sure that your password meets the criteria described in “SAS Web Infrastructure Platform Data Server” in SAS Intelligence Platform: Middle-Tier Administration Guide.

  Note: Record this password because you will need it in the future.

- In Confirm Password, re-enter the password, and click Next.
SAS Web Server: Automated or Manual Configuration Option
Specify whether you want the wizard to configure the SAS Web Server automatically. Click Next.

- If you want to configure the SAS Web Server manually, clear **Configure SAS Web Server automatically**.

  Select this option for the deployment wizard to automatically build and configure the SAS web applications and to configure a sample SAS Web Server for use with SAS 9.4. (To use this wizard feature, make sure that your SAS Web Application Server is not running before proceeding.)

  It is strongly recommended that you choose to automatically configure the SAS Web Server. If you need to make changes to the SAS Web Server after the automatic configuration, there are tools to help you reconfigure it.

  For more information, see “Scripting Tool for SAS Web Application Server” in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

  If you choose not to automatically configure your SAS Web Server, you are prompted for the SAS Web Application Server information, and deployment stages such as configure products, deploy web applications, and start SAS Web Application Servers execute to create instructions for manual configuration. When configuration is completed, follow the manual instructions about how to configure your SAS Web Server and deploy your SAS web applications available at [http://support.sas.com/resources/thirdpartysupport/v94/appservers/index.html](http://support.sas.com/resources/thirdpartysupport/v94/appservers/index.html). (Select the product name of your SAS Web Application Server.)

  **Note:** Manually configuring your SAS middle tier is an advanced task and requires using other documents such as your Instructions.html file.

SAS Web Server: Configuration
Specify SAS Web Server information. Click Next.

- The standard port for HTTP traffic is 80. If you want to change this for SAS Web Server, then specify a new port number in **HTTP Port**.

  **Note:** On UNIX systems, you must start servers as root if you want them to listen on ports lower than 1024. You should install and configure as a less-privileged user, and then start SAS Web Server manually as root.

  For more information, see “Pre-installation Checklist for Ports for SAS” in *SAS Intelligence Platform: Installation and Configuration Guide* and “Managing Alert Email Options for the SAS Metadata Server” in *SAS Intelligence Platform: System Administration Guide*.

- The standard port for TLS traffic is 443. If you want to change this port for SAS Web Server, then specify a new port number in **HTTPS Port**. (See earlier note.)

- In **Configured Protocol**, select the communication protocol for SAS Web Server. There are two choices, HTTP Protocol (unsecured) and HTTP Protocol using Secure Sockets (secured).

  If you select HTTP Protocol using Secure Sockets, an X.509 certificate and RSA private key are required. The deployment wizard prompts you for the paths to these items on a later page. You can enter locations for these items or provide information to create them. For more information, see *SAS Intelligence Platform: Middle-Tier Administration Guide*.

  For more information, see *SAS Intelligence Platform: Middle-Tier Administration Guide*. 
• In **Administrator Mail Address**, enter an email address for email to be sent to the SAS Web Server administrator.

Web Application Server: Multiple Servers
Specify whether to configure multiple SAS Web Application Servers on which to deploy SAS web applications. Click **Next**.

• Select **Configure multiple servers** to have the deployment wizard automatically configure multiple SAS Web Application Servers for you. The deployment wizard uses SAS best practices for choosing the best server to deploy each web application to.

In some situations, it might be preferable to split the SAS web applications across multiple SAS Web Application Servers. This is usually done for performance reasons.

If you choose to manually configure your SAS Web Application Servers, you are provided with recommended configuration values in a generated file (Instructions.html) when the deployment wizard completes.

More advanced performance configuration considerations are documented in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

SAS Web Application Server: Server Configuration
Specify the SAS Web Application Server name and JVM options. Click **Next**.

• In **Server Name**, enter a logical name for your SAS Web Application Server. This name is displayed in your SAS Web Application Server administrative console and used in administrative scripting.

  A suffix is automatically added to the name to distinguish cluster members. For example, if the name SAS1 is entered, the actual name is SAS1_1. If the cluster member multiplier provided on the next wizard page is greater than 1, additional servers are created with unique suffixes. For example, if the multiplier is 2, then servers named SAS1_1 and SAS1_2 are created.

**CAUTION:**

The server name cannot contain special characters (for example, periods, colons, underscores, and so on).

**CAUTION:**

The server name must be unique. Non-unique names cause your web configuration to fail.

• In **Additional JVM Options**, enter any additional Java options that you want the SAS Web Application Server JVM to use. These JVM options are appended to the end of the server’s command line. Deployment wizard default options can be overridden in this way.

  Enter any additional Java options that you want the SAS Web Application Server JVM to use. These JVM options are appended to the end of the server's command line. Deployment wizard default options can be overridden in this way.

**Note:** Determine whether the machine that you are deploying SAS on has these characteristics:

• Uses IPv6 (Internet Protocol Version 6)

• Runs Windows

• Communicates with the SAS Foundation server tier.
If it does, then you must add the following JVM start-up options either now or later to your SAS Web Application Server start-up script:

- `-Djava.net.preferIPv4Stack=false`
- `-Djava.net.preferIPv6Addresses=true`

For more information, see “Designating Ports and Multicast Addresses” in *SAS Intelligence Platform: Installation and Configuration Guide*.

**Web Applications: Automatic Deployment**

Specify whether you want the deployment wizard to automatically deploy SAS web applications to the SAS Web Application Server. Click **Next**.

- **Select Deploy web applications automatically** for the deployment wizard to automatically deploy SAS web applications to the SAS Web Application Server.

If you do not choose to deploy SAS web applications automatically, manual deployment instructions are written to the Instructions.html file during the web application deployment stage.

**Note:** Manually deploying your SAS web applications is an advanced task and requires using other documents such as your Instructions.html file.

Regardless of whether you choose to automatically deploy your SAS web applications, when building web applications, the deployment wizard automatically explodes enterprise application archive (EAR) files.

For more information, see “Deploy Content Manually to the SAS Content Server” in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

**Web Applications: White List of Sites Allowed to Link to this SAS Installation**

Enter a comma-delimited list of additional known hosts and domains to trust. Click **Next**.

- **In URLs White List**, enter a comma-delimited list of additional known hosts and domains to trust in the following form:

  `http|https://host[:port]|domain/`...

  The valid URLs whitelist can include just a list of host names to trust. The valid URLs whitelist can also include wildcards such as * for host name and domain.

  **Note:** The port number must be specified if the whitelisted site uses port numbers other than the standard 80 for HTTP or 443 for HTTPS.

  For example:


  For security reasons, you must list any host name URL for any site that could redirect browsers to your software. This might include corporate sites linking to your software for reporting purposes or single sign-on servers.

  For example, if `https://corporatePortal.company.com/` links to your server, then enter `https://corporatePortal.company.com/` as one entry. This field enables you to add additional known hosts and domains to a preset list automatically created by the SAS configuration process.

  For more information, see “Configure the Cross Domain Proxy Servlet through a Whitelist” in *SAS Intelligence Platform: Middle-Tier Administration Guide*. 

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*Install and Migrate SAS Interactively* 95
Note: After installing SAS 9.4 and migrating your content, you must update the `sas.web.csrf.referers.knownHosts` property using SAS Management Console. For more information about `sas.web.csrf.referers.knownHosts` and how to change its value, see “Modify the Whitelist for URLs and HTTP Request Methods” in SAS Intelligence Platform: Middle-Tier Administration Guide.

- Select **Enter advanced options for URL white list handling** to display an additional page on which you can specify advanced options for the whitelist.

SAS Web Infrastructure Platform Scheduling Services Dependencies
Specify the product instances on which scheduling services are dependent. Click **Next**.

- In **SAS Application Server Context**, select the server context on which to base the configuration of SAS Web Infrastructure Platform.

  Note: Avoid choosing the SASMeta server context.

SAS Content Server: Repository Directory
Specify SAS Content Server information. Click **Next**.

- In **Repository Directory**, enter the location for the SAS Content Server indexes and repository configuration file. Click **Browse** to search for this location.

  For more information, see “Administer the SAS Content Server” in SAS Intelligence Platform: Middle-Tier Administration Guide.

- Select **Start initial node as clustered** if this machine is (or might be) part of a clustered deployment.

  **CAUTION:**

  If you enable this option, you must establish a central backup vault for the SAS Deployment Backup and Recovery Tool. Starting in SAS 9.4M2, a vault is no longer required for clustered SAS Content Servers.

  Deselect **Start initial node as clustered** if you are not deploying the SAS middle tier on a machine cluster. (This option enables journaling and the necessary cluster synchronization processes.)

  If you redeploy the SAS middle tier on a machine cluster in the future, you can manually specify the Java system property `-Dcom.sas.server.isclustered=true` and restart the initial application server node. For more information, see “Add a Horizontal Cluster Member” in SAS Intelligence Platform: Middle-Tier Administration Guide.

SAS Environment Manager Mid-Tier Dependencies
Specify the product instances on which SAS Environment Manager is dependent. Click **Next**.

- In **SAS Application Server Context**, select the server context on which to base the configuration of SAS Environment Manager.

  **Note:** Avoid choosing the SASMeta server context.

SAS Environment Manager: Administration Database Configuration
Specify SAS Environment Manager information. Click **Next**.

- In **User ID**, enter the user ID for accessing the database used with your SAS Web Infrastructure Platform Database tables. This user ID must have the ability to insert, update, and delete records.
By default, the SAS Environment Manager uses the Administration database on the SAS Web Infrastructure Platform Data Server. If you are using the SAS Web Infrastructure Platform Data Server, the user ID is Read-only.

For more information, see “SAS Web Infrastructure Platform Data Server” in SAS Intelligence Platform: Middle-Tier Administration Guide.

- In **Password**, enter a valid password for the user ID.

  **Note:** Record this password because you will need it in the future.

- In **Confirm Password**, re-enter the password.

SAS Internal Account: SAS Environment Manager Service Account
Specify the password for the SAS Environment Manager Service. Click **Next**.

- In **SAS Environment Manager Service Account Password**, enter a password for the SAS Environment Manager Service account (sasevs@saspw).

  The password must contain at least six characters. Make sure that you enter the same password that was specified in any previous SAS Environment Manager configuration prompts.

  **Note:** Record this password because you will need it in the future.

  This account is required for the SAS Environment Manager Service and its agent to communicate while monitoring the processes in your SAS deployment. This internal SAS account has unrestricted administrative access rights to the SAS Metadata Server.

- In **Confirm Password**, re-enter the password.

SAS Environment Manager: Database Configuration
Specify SAS Environment Manager database information. SAS Environment Manager is a default Postgres database provided by SAS that stores collected server metrics. Click **Next**.

  - In **Database User**, enter a user ID for accessing the SAS Environment Manager database.

  - In **Database User Password**, enter a valid password for the user ID associated with the database account.

    **Note:** Record this password because you will need it in the future.

  - In **Confirm Password**, re-enter the password.

  - In **Database Encryption Passphrase**, enter a valid passphrase key for encrypting and decrypting the SAS Environment Manager database user password.

    The key must be at least eight characters long and can contain letters and numbers only.

    **Note:** Record this passphrase because you will need it in the future.

  - In **Confirm Database Encryption Passphrase**, re-enter the passphrase key.

  Click **Next**.

SAS Visual Analytics Transport Service: Whitelist Mobile Devices
Specify whether to enforce a whitelist for SAS Visual Analytics Apps, and click **Next**.

- Select **Enforce whitelist for mobile devices** to use a whitelist to control access to SAS Visual Analytics Apps.
A deployment enforces either the blacklist or the whitelist. If the whitelist is not selected to be enforced, the blacklist is enforced by default. If the whitelist is enforced, only devices that are on the whitelist can use SAS Visual Analytics Apps. If the blacklist is enforced, any device that is not on the blacklist can use SAS Visual Analytics Apps. Although only one list is enforced, you can make changes to both lists.

For more information, see “Enable or Prevent Access by Using the Whitelist and Blacklist” in SAS Intelligence Platform: Middle-Tier Administration Guide.

SAS Visual Analytics Admin: Context Root
Specify the context root. Click Next.

- In Context Root for SAS Visual Analytics Admin, enter the context root.

  The form of the URL for SAS Visual Analytics Administrator is http://machine:port/SASVisualAnalyticsAdministrator. Although the machine and port are configured elsewhere and they typically apply to the web container as a whole, the SASVisualAnalyticsAdministrator portion is the context root, and you can change it (within the constraints of URL rules).

SAS Visual Analytics Hyperlink Service: Context Root
Specify the context root. Click Next.

- In Context Root for SAS Visual Analytics Hyperlink Service, enter the context root.

  The form of the URL for SAS Visual Analytics Service Hyperlink Service is http://machine:port/SASVisualAnalytics. Although the machine and port are configured elsewhere and typically apply to the web container as a whole, the SASVisualAnalytics portion is the context root, and you can change it (within the constraints of URL rules).

SAS Visual Analytics Administrator Dependencies
Specify the product instances on which Administrator is dependent. Click Next.

- In SAS Application Server Context, select the server context on which to base the configuration of Server Administrator.

  Note: Avoid choosing the SASMeta server context.

SAS Deployment Backup and Recovery Tool: Enable Central Vault
Indicate whether to use a central backup vault for the SAS Deployment Backup and Recovery Tool. Click Next.

- Select Enable central vault storage of backup files to enable central storage of backup files by specifying a network-accessible vault directory.

  CAUTION:
  
  If your SAS deployment is not current SAS 9.4M2, then a central backup vault directory is required if your middle-tier environment includes a clustered SAS Content Server.

  The default value for the central backup vault directory is kept blank. The feature of storing backup files at a central location is disabled by default.

  To enable this feature, provide a directory shared across all the tiers. The default retention period for a backup is 30 days. If the configuration that you are performing requires a backup at a central shared location and you want to change the retention period, change the Retention period.
(On Windows only) Provide a valid operating system (external) user account and password to execute commands using the SAS Deployment Agent. This user account must have the following characteristics:

- It must be an external account that has access to and sufficient privileges for each host machine to be included in the backup.
- It must be known to the host machine that contains the central vault.
- It must have Read and Write access to the following directories:
  - the central vault directory
  - `SAS-configuration-directory/SASMeta/Metadata`

For more information, see “Using the Deployment Backup and Recovery Tool” in *SAS Intelligence Platform: System Administration Guide*.

45. Deployment Summary

Review software that the deployment wizard plans to install and configure.

- 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.

  *Note:* Before proceeding with the migration, make sure that the information that you have provided to the deployment wizard is correct. Incorrect user input such as user IDs and passwords cause all or portions of your migration to fail.

Make one of the following choices:

- Click **Start** to begin installing SAS files and writing the configuration to the current machine.

  The deployment wizard launches the installation and configuration process and provides an ongoing status update.

- Click **Back** to navigate to previous pages to change installation and configuration information.

- Click **Cancel** to terminate the deployment wizard session. Note that you will lose installation and configuration information previously entered.

**CAUTION:**

If you encounter a situation in which the deployment wizard reports a configuration failure, leave the error message displayed. Do not continue. Consult additional documentation and, if necessary, contact SAS Technical Support. Moving past an error most often results in having to delete your deployment and start over.

On UNIX, when you are installing the server tier, you are 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.

Your credentials are temporarily stored in your Windows Registry using the Windows automatic logon functionality. In rare circumstances, it is possible that those values will remain in your Windows Registry after they are used. This poses a potential security risk.
For more information about this functionality including any risks, see Microsoft documentation about security and automatic logons. You should weigh the risk of convenience of automatic logon after restart against the security policies in place at your site.

46. Deployment Complete

The Deployment Complete page displays the configuration results for each SAS product.

- A green check mark next to every item on this page indicates that your deployment completed successfully. Click Next.
- If you received errors during your deployment, then contact SAS Technical Support at support@sas.com. Attach to your email the files listed in “Review SAS Deployment Tool Documents, Reports, and Logs” in SAS Intelligence Platform: Installation and Configuration Guide.
47. Additional Resources

Use the links displayed to review more information about your SAS deployment.

- Click **Finish** to close the SAS Deployment Wizard.

Proceed to the section, “Review SAS Deployment Wizard Documents, Reports, and Logs” on page 106 to examine the SAS Deployment Wizard output to troubleshoot any configuration errors and complete any necessary manual configuration steps.

48. Configuration Guidelines and Details
Review configuration guidelines and details for post-deployment steps. Click Next.

- To complete your SAS deployment, review the configuration guidelines and details and perform the steps listed.

  Configuration Guidelines and Details (the Instructions.html file) is automatically generated by the deployment wizard. It has post-installation steps specific to your SAS order that you must perform.

- The SAS Deployment Wizard writes the Configuration Guidelines and Details (the Instructions.html file) to the Documents directory under the SAS configuration path. For example:

  - Windows:
    
    C:\SAS\Config\Lev1\Documents\Instructions.html

49. 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. (You do not need to back up machines that contain only SAS clients.)

  - Make a backup copy of your SAS 9.4 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 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 “About Backing Up and Restoring Your SAS Content” in SAS Intelligence Platform: System Administration Guide.

50. When you are finished completing any manual configuration tasks, and you have made the necessary backups, repeat the steps listed in this topic on each machine specified in your deployment plan.
51. Be sure to restart any servers that you stopped for purposes of creating a backup.

52. When you are finished installing and migrating SAS on each machine called for in your deployment plan, proceed to the section entitled, “Overview of Performing Post-migration Tasks” on page 106.

**Automating SAS 9.4 Client Installation across 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 9.4 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. For more information, see “Automating the SAS Installation on Multiple Machines” in *SAS Intelligence Platform: Installation and Configuration Guide*. 
Chapter 5
Performing Post-migration Tasks

Overview of Performing Post-migration Tasks ........................................... 106
Install Hot Fixes ......................................................................................... 106
Review SAS Deployment Wizard Documents, Reports, and Logs ............. 106
Metadata Server Tier Post-migration Tasks ............................................. 108
  Update Third-Party Software Server Definitions .................................. 108
Server Tier Post-migration Tasks ............................................................. 108
  Overview of Server Tier Post-migration Tasks ................................... 108
  SAS Visual Analytics Autoload Post-Configuration Task ..................... 109
  Recompile SAS Macro Catalogs ......................................................... 109
  EXTENDOBSCOUNTER (EOC) System Option ................................. 109
  z/OS Burst Set and Optimizer Library Considerations ............................ 110
  Update SAS Server Configuration Files ............................................. 110
  Update Stored Process Archive Package Paths .................................. 111
  About Migrated OLAP Cubes ............................................................ 111
  Redeploy Jobs for Scheduling ............................................................. 111
  Backup for JCL for Deployed Jobs ....................................................... 111
  Verify Migrated Jobs with Data Quality Transformations ..................... 112
  Reschedule Flows .............................................................. 112
  Modify Migrated Information Maps to Enable SAS Web
    Report Studio Optimization ............................................................. 113
  Post-migration Tasks for SAS Data Management Server (SAS 9.3 to SAS 9.4) .. 113
Middle-Tier Post-migration Tasks ........................................................... 114
  Overview of Middle-Tier Post-migration Tasks ................................... 114
  Review the SAS Middle-Tier Configuration .................................. 115
  Update a Whitelist-Related Property in SAS Management Console ....... 115
  Reconfigure Transport Layer Security (TLS) ....................................... 115
  Review Role Changes to SAS Web Report Studio ............................... 115
  Redefine Themes and Branding ......................................................... 116
  Location of Dashboards and Indicators ............................................. 116
  SAS BI Dashboard and JDBC DSX Files ............................................. 116
  Deprecated Middle Tier Property ..................................................... 117
  Reviewing Your WebDAV Configuration ............................................. 117
  Update SAS Information Delivery Portal URLs .................................. 117
Overview of Performing Post-migration Tasks

This is the fourth of five tasks required to install SAS 9.4 and migrate your current SAS content:

☑ 1. Design your migration.
☑ 2. Perform pre-migration tasks.
☑ 3. Install SAS 9.4 and migrate your content from an earlier SAS version.
4. Perform post-migration tasks.
5. Validate your migration.

The actual manual post-migration tasks that you should perform depend on which SAS products you are migrating. Regardless of the SAS products that make up your deployment, you should follow the steps listed in Instructions.html and review any configuration errors in ConfigurationErrors.html and in the configuration logs. For more information, see “Review SAS Deployment Wizard Documents, Reports, and Logs” on page 106.

The remaining post-migration tasks are grouped according to the tier:

- “Metadata Server Tier Post-migration Tasks” on page 108
- “Server Tier Post-migration Tasks” on page 108
- “Middle-Tier Post-migration Tasks” on page 114

For a discussion of functionality changes in SAS 9.4, see SAS Guide to Software Updates and Product Changes.

Install Hot Fixes

After you complete your migration and before you put your newly migrated deployment into production, you should check for and apply any hot fixes. For more information, see “Installing a Hot Fix” in SAS Guide to Software Updates and Product Changes.

Review SAS Deployment Wizard Documents, Reports, and Logs

During configuration of SAS 9.4 the SAS Deployment Wizard creates various documents 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 Levn/Documents subdirectory (for example: C:\SAS\Config94\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 \Config94\Lev1\Documents).

• ConfigurationErrors.html contains a list of any configuration errors that require further attention. ConfigurationErrors.html resides under the SAS configuration directory in the Levn/Documents subdirectory (for example: C:\SAS \Config94\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\Config94\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
  - UNIX:
    home-directory/.SASAppData/SASDeploymentWizard

• logCrossplatformOutput.log Generated when migrating from one version of an operating system to another (within families: Windows to Windows or UNIX to UNIX). Outlines parameters passed to MIGRATE and CIMPORT along with the corresponding logs generated by these two SAS procedures. logCrossplatformOutput.log resides under the SAS configuration directory in the Levn/Logs/Configure subdirectory (for example: C:\SAS\Config94\Lev1\Logs \Configure).

• logPermissionsOutput.log Generated when migrating from one version of an operating system to another (within families: Windows to Windows or UNIX to UNIX). The result of applying all permission migration commands is logged to this file. It shows which commands failed along with the console error for the same. logPermissionsOutput.log resides under the SAS configuration directory in the Levn/Logs/Configure subdirectory (for example: C:\SAS\Config94\Lev1\Logs \Configure).

• Levn/Temp subdirectory All the failed permission commands that are run during the migration are persisted in this subdirectory. You should review the output in this directory. If you encounter any failed attempts, you should make the necessary modification and rerun the commands. For example, if the command failed due to an invalid user on the target machine, either create the user and rerun the command file or change the user ID to the actual new user and rerun the command file.
Metadata Server Tier Post-migration Tasks

Update Third-Party Software Server Definitions

Your SAS 9.4 migrated system can contain metadata describing third-party servers, such as web application and database servers. These server definitions are stored in SAS metadata repositories and might need to be modified on the SAS 9.4 system using SAS Management Console to reflect changes to the new system. Examples of such changes might include new host names, ports, connection attributes, or security information. A list of migrated third-party metadata is provided in your SAS Migration Utility analysis report. To view your migration analysis report, point a web browser to the AnalysisReport.xml file in the AnalysisReport subdirectory underneath the output directory that you specified when you last ran the SAS Migration Utility.

Refer to your Instructions.html file for more information about what steps you might need to perform. Instructions.html resides under the SAS configuration directory in the \Lev1\Documents subdirectory (or example, C:\SAS\Config94\Lev1\Documents).

Server Tier Post-migration Tasks

Overview of Server Tier Post-migration Tasks

The following topics are contained in this section:

- "SAS Visual Analytics Autoload Post-Configuration Task" on page 109
- "Recompile SAS Macro Catalogs" on page 109
- "EXTENDOBSCOUNTER (EOC) System Option" on page 109
- "z/OS Burst Set and Optimizer Library Considerations" on page 110
- "Update SAS Server Configuration Files" on page 110
- "Update Stored Process Archive Package Paths" on page 111
- "About Migrated OLAP Cubes" on page 111
- "Redeploy Jobs for Scheduling" on page 111
- "Backup for JCL for Deployed Jobs" on page 111
- "Verify Migrated Jobs with Data Quality Transformations" on page 112
- "Reschedule Flows" on page 112
- "Modify Migrated Information Maps to Enable SAS Web Report Studio Optimization" on page 113
SAS Visual Analytics Autoload Post-Configuration Task

The SAS Migration Utility does not migrate files and directories that were created using the Configure Autoload Directory for SAS Visual Analytics task in the SAS Deployment Manager. The migration utility migrates the autoload metadata objects only.

To migrate the files and directories, you must rerun the Configure Autoload Directory for SAS Visual Analytics task as a post-migration step on the SAS server tier. When rerunning the SAS Deployment Manager, be sure to specify Pre-existing Library on the SAS LASR Artifacts page.

Recompile SAS Macro Catalogs

When you are migrating within an operating system family (for example, AIX to Solaris), SAS macro catalog files might not migrate. The workaround is to recompile these macro catalogs. For more information, see SAS Macro Language: Reference.

EXTENDOBSCOUNTER (EOC) System Option

The EXTENDOBSCOUNTER (EOC) system option is new for SAS 9.4. In SAS 9.3, this option was available only as a data set option and a LIBNAME option.

- If you are creating data sets with SAS 9.4 and those data sets need to be backward compatible with a SAS release earlier than SAS 9.3, set the EXTENDOBSCOUNTER system option to NO.
If your SAS 9.4 data sets are not going to be read by a SAS release earlier than SAS 9.3, set the EXTENDOBSCOUNTER system option to YES. For more information, see “Base SAS 9.4” in SAS Guide to Software Updates and Product Changes.

z/OS Burst Set and Optimizer Library Considerations

If the burst set library is pre-assigned in z/OS, attempting to distribute using an existing burst set in that library generates a message that the table could not be read (or a blank list) when you select Recipients and Distribution Rules. Attempting to create a new burst set while the library is pre-assigned generates exceptions, similar to the following:

An error occurred in processing the page request.
createBurstSet()
(com.sas.report.output.management.OutputManagementException: The physical data is not available [ java.sql.SQLException: Unable to execute for an undetermined reason. SQL passthru expression contained these errors: ERROR: Libname WRSDIST is not assigned.

[ java.sql.SQLException: SQL passthru expression contained these errors: ERROR: Libname WRSDIST is not assigned. ] ] )
SQL passthru expression contained these errors: ERROR: Libname WRSDIST is not assigned.

Root Cause: java.sql.SQLException: SQL passthru expression contained these errors: ERROR: Libname WRSDIST is not assigned.

In actuality, the library is pre-assigned, but the message states that it is not. Removing the pre-assigned flag returns functionality to normal.

Update SAS Server Configuration Files

As mentioned earlier, certain SAS Application Server configuration files such as autoexec files (appserver_autoexec.sas) and sasv9.cfg files are not migrated. At some point, you might need to tune these files with configuration settings (such as Java options) appropriate for your site. For more information, see “Optional Setup Tasks” on page 128.

Note: Starting in SAS 9.4 M2, the migration utility copies to the target system user modification files for those servers that were created with the SAS Deployment Wizard. Servers created with SAS Management Console or by other means are not migrated. The migration utility creates a sourceusermods subfolder within each server folder in the configuration directory on the target system that contains all the usermods files. This folder contains all the source usermods files for that server. To implement the source usermods files, ensure that all paths and options are relevant to the target environment and replace the target usermods file with the file from the sourceusermods directory. Any user modification files located in the root of the configuration directory (for example, C:\SAS\config\Lev1) are not copied.

Although any settings in config or autoexec files are not migrated, load balancing configuration and metadata information for SAS servers is migrated. (Load balancing here should not be confused with server clustering—the management of multiple SAS Web Application Servers on the SAS middle tier.) For more information about the load balancing algorithms available in SAS 9.4, see “Understanding the Load Balancing Algorithms” in SAS Intelligence Platform: Application Server Administration Guide.
**Update Stored Process Archive Package Paths**

The SAS automated migration tools update stored process archive package paths that point to locations inside the SAS configuration directory.

The SAS Migration Utility cannot update any paths that reside outside of the configuration directory. The migration utility flags such problematic paths in its migration analysis report. In SAS 9.4, stored process archive package paths are no longer modeled by metadata but are stored in prompt metadata. Therefore, after the SAS Deployment Wizard finishes executing, you will need to manually update the _ARCHIVE_PATH prompt for all affected stored processes using SAS Management Console. For more information, see “Developing Stored Processes with Package Results” in *SAS Stored Processes: Developer’s Guide* and the prompt Help in SAS Management Console online Help.

**About Migrated OLAP Cubes**

Cube files maintain their physical status in metadata. The OLAP procedure does not overwrite a cube repository if it finds files already present. Instead, PROC OLAP creates a new folder with a unique name for the new cube. For this reason, OLAP cubes that were built in SAS 9.2 can be used in SAS 9.4 without rebuilding them, although some situations might require action on your part:

- If your SAS 9.2 cubes were built using relative paths, you can move the physical files from one location to another and avoid rebuilding the cubes.
- If your SAS 9.2 cubes were built in a common, network-accessible location, no action is required.
- If your SAS 9.2 cubes are using new hardware in SAS 9.4, you must rebuild the cubes.

If there is no change to the path, then you can rebuild the cube by first submitting PROC OLAP with the DELETE_PHYSICAL option to ensure that all physical files are removed. Then, you re-submit PROC OLAP to create the physical files from the existing metadata definition. If the physical files are not accessible, the first PROC OLAP step might generate an error or warning, but ignore this and the cube can be built.

*Note:* Cubes that you build in SAS 9.4 are not supported on SAS 9.2 OLAP Servers.

**Redeploy Jobs for Scheduling**

All jobs that were deployed for scheduling or were deployed as stored processes should be redeployed in the SAS 9.4 environment. From the SAS Data Integration Studio desktop, you can select **Tools ➔ Redeploy Jobs for Scheduling** or **Tools ➔ Redeploy Jobs to Stored Processes.**

**Backup for JCL for Deployed Jobs**

The SAS Migration Utility modifies JCL files associated with deployed jobs with their new SAS 9.4 path. The migration utility stores backups of the original JCL files in a directory named **oldjclbackup** located under the same parent directory where the JCL was migrated.
Verify Migrated Jobs with Data Quality Transformations

If jobs that include the Create Match Code transformation do not run successfully after migration, verify that the appropriate Quality Knowledge Base (QKB) location value (DQSETUPLOC value), is specified on the global options window for SAS Data Integration Studio.

Reschedule Flows

After migrating to SAS 9.4, owners of scheduled flows will need to submit them to the scheduling server used by the SAS 9.4 system. To reschedule flows, follow these steps:

1. Determine the user IDs associated with each flow. (Locate the checklist that you completed earlier in “Apply Any Required SAS Maintenance” on page 38.)

2. If you have migrated any SAS web applications, such as SAS Web Report Studio, verify that scheduling is enabled (Plug-ins ⇒ Application Management ⇒ Configuration Manager ⇒ SAS Application Infrastructure ⇒ Web Report Studio 4.4 ⇒ Properties ⇒ Settings ⇒ Application ⇒ Scheduling).

   ![Web Report Studio 4.2 Properties](image)

   Note: For more information, see “Use Configuration Manager” in SAS Intelligence Platform: Middle-Tier Administration Guide.

3. Reschedule the flow for your SAS product. For example:
   - For SAS Data Integration Studio, reschedule job flows.
     In SAS Management Console, use the reschedule function in Schedule Manager.
     For more information, see SAS Management Console online Help.
   - For SAS Web Report Studio, reschedule report flows.
     In SAS Web Report Studio, on the Scheduled and Distributed Reports window (File ⇒ Manage Files ⇒ View scheduled and distributed reports), use the Actions button.
     For more information, see SAS Web Report Studio online Help.
Modify Migrated Information Maps to Enable SAS Web Report Studio Optimization

When a measure data item that meets the following criteria is migrated from SAS 9.2 to SAS 9.4, it is not automatically optimized for SAS Web Report Studio in the same way that an identical, new SAS 9.4 data item is optimized.

- The measure data items are in an information map that was migrated from SAS 9.2 to SAS 9.4 by using the SAS automated migration tools.
- The migrated information map has large data sources.
- The migrated measure data items are used in the expressions of other measure data items.
- The default aggregate function for a migrated measure data item is specified as a property of the data item instead of being defined in the data item expression.

To optimize these migrated data items for SAS Web Report Studio, you must re-create them in a SAS 9.4 environment. Consider the following example, which uses SAS Information Map Studio 4.2 to re-create some migrated data items:

1. When you re-create one of these data items, specify its aggregate function as a property of the data item (that is, follow the same basic steps that you followed when you created the data item). Do not define the aggregate function in the expression of the data item.

   For example, data item DataItem1 was created in SAS Information Map Studio 3.1 and its aggregate function, \textit{SUM(argument)}, was specified on the \textit{Classifications/Formats} tab. In SAS Information Map Studio 4.2, re-create this data item and select \textit{SUM(argument)} on the \textit{Classifications, Aggregations, Formats} tab.

   \textit{Note:} Copying and pasting the information map or data items, or just updating the existing data items will not cause optimization to occur. You must create brand new data items.

2. Delete the old measure data item or name the new one with a unique name.

3. Go through your reports and modify any references to point to the new data items that you created.

   \textit{Note:} Neither new nor migrated measure data items are optimized for SAS Web Report Studio if the aggregate functions of the data items are defined in the data item expressions. If one of these data items is also referenced by the expression of another data item, then you can optimize it if you can change to specifying its aggregate function as a property of the data item.

For more information, see SAS Information Map Studio 4.4 online Help and the \textit{Base SAS Guide to Information Maps}.

Post-migration Tasks for SAS Data Management Server (SAS 9.3 to SAS 9.4)

When performing a SAS 9.3 to SAS 9.4 migration, complete these post-migration steps to finish your migration of SAS Data Management Server:

1. Update values in app.cfg for the Quality Knowledge Base installation directory.

   For more information, see the \textit{DataFlux Migration Guide}, which is provided as part of the DataFlux migration assessment service.
2. Enable licensing for the new Data Management Server.
   For more information, see the DataFlux Migration Guide, which is provided as part of the DataFlux migration assessment service.

3. Using a text editor, do the following to dmserver.cfg:
   - Update the SOAP port to the port number for the Data Management Server that was specified for it on the SAS Deployment Wizard Port Remap page on page 87.
   - Add the following for the WLP port:
     \begin{verbatim}
     DMSERVER/WLP/SVR/LISTEN_PORT=\text{WLP-port}
     \end{verbatim}
     where \text{WLP-port} is the new WLP port.
   dmserver.cfg resides in the SAS-installation-directory/dmserver directory (for example, /var/sashome/dmserver).

4. Start the new Data Management Server by entering the following command from a Windows command prompt or a UNIX console:
   \texttt{SAS-installation-directory/dmserver/bin/dmsadmin start}

5. Contents of the Data Management Server batch\_jobs and data\_services directories are not copied over to the target system as part of the migration process. Therefore, you must manually move these directories.
   For more information, see the DataFlux Migration Guide, which is provided as part of the DataFlux migration assessment service.

6. Using SAS Management Console, associate a resource template for the Data Management Server. For more information, see SAS Management Console online Help and search for “resource template.”

7. Update Jobs that used the source DM server to use the new target DM Server.
   Jobs that include Data Quality transformations that reference the DataFlux Data Management Server require the new target server definition. Therefore, open each job and select the new server definition in the Data Quality transformation.
   For more information, see “Working with SAS Data Management Offerings” in SAS Data Integration Studio: User’s Guide.

8. Delete the old Data Management Server definition in SAS Management Console after all jobs have been updated. For more information, see SAS Management Console online Help and search for “delete server.”

---

**Middle-Tier Post-migration Tasks**

**Overview of Middle-Tier Post-migration Tasks**

The following topics are contained in this section:

- “Review the SAS Middle-Tier Configuration” on page 115
- “Update a Whitelist-Related Property in SAS Management Console” on page 115
- “Reconfigure Transport Layer Security (TLS)” on page 115
- “Review Role Changes to SAS Web Report Studio” on page 115
Review the SAS Middle-Tier Configuration

The automated migration tools do not preserve any of the SAS middle-tier configuration information. The deployment of the SAS 9.4 middle tier is always “out of the box.” Many of the defaults have changed, and any customizations should be reviewed with respect to SAS 9.4 web administration guidelines before they are implemented. Do not assume that the defaults used in SAS 9.2 or SAS 9.3 middle-tier configuration are appropriate for SAS 9.4. For more information, see *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Update a Whitelist-Related Property in SAS Management Console

After migration, you must update the sas.web.csrf.referers.knownHosts property using SAS Management Console. For more information about sas.web.csrf.referers.knownHosts and how to change its value, see “Modify the Whitelist for URLs and HTTP Request Methods” in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Reconfigure Transport Layer Security (TLS)

Any configuration of TLS (also known as SSL) made to your SAS system is not migrated. After you migrate your SAS system, you have to reconfigure TLS.

For more information, see “Configure SAS Web Server Manually for HTTPS” in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Review Role Changes to SAS Web Report Studio

SAS Web Report Studio 4.4 uses the user roles that are implemented in SAS 9.4. For information about SAS 9.4 roles, see “Availability of Application Features in a New Deployment” in *SAS Intelligence Platform: Security Administration Guide*.

You should review your migrated SAS Web Report Studio users and their re-mapped roles to determine whether you should make any changes. The capabilities for most of your SAS Web Report Studio migrated users should remain the same. However, any SAS Web Report Studio 3.1 advanced users lose the ability to manage distribution lists. To review roles and to manually re-apply any lost capabilities, refer to the *SAS Intelligence Platform: Web Application Administration Guide*. 
Redefine Themes and Branding

SAS 9.2 and later includes a new theme infrastructure that is used by web applications such as SAS Web Report Studio and the SAS Information Delivery Portal.


The product-specific branding that was available in SAS Web Report Studio 4.2 is no longer supported, and there are no provisions for migrating older branding changes to the new themes in version 4.4. This means that the branded areas must be redefined in the new themes infrastructure.

Location of Dashboards and Indicators

After you upgrade to SAS BI Dashboard 4.4, update the URLs for all SAS BI Dashboard static links, STM data (in indicator data), and custom graph indicators that use stored processes. You update these URLs in the SAS BI Dashboard Image Web address field. See your SAS BI Dashboard online Help for more information.

After migration, dashboards and any objects in the dashboard (such as indicators, models, and ranges) are metadata objects and are saved in SAS Folders, so any dashboards that you created prior to SAS BI Dashboard 4.3 are saved as metadata objects. The default location for these metadata objects is the Products \BIDashboard 4.4 directory. This directory contains the DashboardConfigs, IndicatorDefinitions, ModelConfigs, and RangeDefinitions subdirectories.

CAUTION:
Do not move the contents of these folders into different folders. If the contents of these folders are moved to different folders, these objects cannot be used with their dashboards.

SAS BI Dashboard and JDBC DSX Files

If your SAS BI Dashboard relies on any data sources specified in JDBC data source XML (DSX) files, then you must manually migrate these data sources.

You have two options for migrating your data:

• Move the data under metadata control.

• Continue to use a SAS libref that points to the workspace server's file system.

If you use this libref method, then you must manually fix the librefs in JDBC DSX files.

For more information, see “Working with Data Source XML (.dsx) Files” in SAS Intelligence Platform: Web Application Administration Guide.
**Deprecated Middle Tier Property**

In SAS 9.3, a property was added to the SAS middle tier, `Policy.DisableConcurrentUserLogins`. The value of `Policy.DisableConcurrentUserLogins` is either `true` or `false`.

In SAS 9.4, `Policy.DisableConcurrentUserLogins` has been replaced by `Policy.ConcurrentUserLogins`. The value of `Policy.ConcurrentUserLogins` is either `deny` or `logoff`.

**Reviewing Your WebDAV Configuration**

**Review WebDAV Report Repository Permissions**

After migration, you should review your WebDAV security settings and make the changes appropriate for your site and its security needs. For more information, see “Implement Authorization for the SAS Content Server” in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

**Note about Migrated WebDAV Content Datestamps**

The SAS automated migration tools replace creation dates on content with the date on which the migration occurred. The migration tools preserve modification dates on content. For this reason, migrated WebDAV content can have a creation date that is later than its modification date.

**Update Enterprise Miner Workspace Server WebDAV Paths**

If you published Enterprise Miner model packages to a WebDAV server, you might need to manually update the WebDAV path.

For more information, see the *SAS Enterprise Miner: Administration and Configuration*.

**Update SAS Information Delivery Portal URLs**

Some additional steps must be performed after the SAS Deployment Wizard executes to ensure that links within the SAS Information Delivery Portal have migrated appropriately. To facilitate this process, SAS supplies a script that you should run to perform these tasks. Refer to Instructions.html for more information.

Instructions.html resides under the SAS configuration directory in the `Levn/Documents` subdirectory (for example, C:/SAS/Config94/Lev1/Documents).
Validating Your SAS Migrated Deployment

This is the fifth of five tasks required to install SAS 9.4 and migrate your current SAS content.

1. Design your migration.
2. Perform pre-migration tasks.
3. Install SAS 9.4 and migrate your content from an earlier SAS version.
4. Perform post-migration tasks.
5. Validate your migration.

Validation consists of the following tasks:

- performing the initial validation of SAS servers and applications. For more information, refer to Instructions.html located on your migration target machines under: SAS-Configuration-directory/Documents
- confirming that your content and SAS configuration has migrated correctly.

For a discussion of functionality changes in SAS 9.4, see SAS Guide to Software Updates and Product Changes.
Chapter 7
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 7.1  First-Priority Setup Tasks

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check for and apply SAS hot fixes</td>
<td>A best practice is to check for and apply SAS software hot fixes immediately after deployment and before putting your SAS system into production. Doing so ensures that you have the latest important SAS fixes relevant to your site. For more information, see “Installing a Hot Fix” in SAS Guide to Software Updates and Product Changes.</td>
</tr>
<tr>
<td>Task</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>Secure the SAS configuration on each server machine.</td>
<td>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 123. 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 126.</td>
</tr>
<tr>
<td>Establish a formal, regularly scheduled backup process.</td>
<td>Establish a formal, regularly scheduled backup process that includes your metadata repositories as well as the associated physical files. SAS includes a server-based facility that performs metadata server backups automatically on a scheduled basis. By default, these backups are scheduled to run at 1:00 a.m. every day except Sunday. 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. Be sure to include this backup location in your regular system backups. See “Backing Up and Recovering the SAS Metadata Server” in 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. The Deployment Backup and Recovery tool, new with SAS 9.4, provides an integrated method for backing up and recovering SAS content across multiple tiers and machines. The backup includes the metadata server as well as resources such as the SAS Content Server and server configuration files. If this tool has been configured, scheduled backups are run each Sunday at 1:00 a.m. by default. See “Using the Deployment Backup and Recovery Tool” in SAS Intelligence Platform: System Administration Guide. For guidance in setting up a backup process, see: • “About Backing Up and Restoring Your SAS Content” in SAS Intelligence Platform: System Administration Guide • “Setting Up Your Backups” in SAS Intelligence Platform: System Administration Guide</td>
</tr>
</tbody>
</table>

**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 7.2 Recommended Operating System Protections on Windows**

<table>
<thead>
<tr>
<th>Directories</th>
<th>Users</th>
<th>Recommended Permissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS-configuration-directory</td>
<td>SYSTEM and Administrators</td>
<td>Full Control</td>
</tr>
<tr>
<td></td>
<td>All other users</td>
<td>List Folder Contents, Read</td>
</tr>
<tr>
<td>Directories</td>
<td>Users</td>
<td>Recommended Permissions</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>------------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>SAS-configuration-directory\Lev1</td>
<td>SYSTEM and Administrators</td>
<td>Full Control</td>
</tr>
<tr>
<td></td>
<td>SAS Spawmed Servers (sassrv)</td>
<td>On Windows Vista, Windows 7, and Windows Server 2008: Special Permissions to read and execute**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On Windows XP: Read and Execute*</td>
</tr>
<tr>
<td></td>
<td>All other users</td>
<td>List Folder Contents, Read</td>
</tr>
<tr>
<td>SASMeta\MetadataServer</td>
<td>SYSTEM and Administrators</td>
<td>Full Control</td>
</tr>
<tr>
<td></td>
<td>SAS Metadata Server: Service Login Account (for example, sassvlgtn)**</td>
<td>Full Control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remove all other users and groups</td>
</tr>
<tr>
<td>SASMeta\MetadataServer\Backups (or other metadata server backup location)</td>
<td>SAS Deployment Backup and Recovery Tool User Account, also referred to as the backup user (for example, sasbackup)**</td>
<td>Read</td>
</tr>
<tr>
<td>Lev1\SASApp</td>
<td>SYSTEM and Administrators</td>
<td>Full Control</td>
</tr>
<tr>
<td></td>
<td>SAS Spawmed Servers (sassrv)</td>
<td>Windows Vista, Windows 7, and Windows Server 2008 only: Special Permissions to read and execute*</td>
</tr>
<tr>
<td></td>
<td>All other users</td>
<td>List Folder Contents, Read</td>
</tr>
<tr>
<td>Lev1 subdirectories: Documents, ReportBatch, SASMeta, Utilities, Web</td>
<td>SYSTEM and Administrators</td>
<td>Full Control</td>
</tr>
<tr>
<td></td>
<td>All other users</td>
<td>List Folder Contents, Read</td>
</tr>
<tr>
<td>Lev1 subdirectories:</td>
<td>SYSTEM and Administrators</td>
<td>Full Control</td>
</tr>
<tr>
<td>• ConnectSpawner</td>
<td></td>
<td>Remove all other users and groups</td>
</tr>
<tr>
<td>• Logs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• ObjectSpawner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• SASApp\OLAPServer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• ShareServer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### directories

<table>
<thead>
<tr>
<th>Directories</th>
<th>Users</th>
<th>Recommended Permissions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SASApp subdirectories</strong></td>
<td>SYSTEM, Administrators</td>
<td><strong>Full Control</strong></td>
</tr>
<tr>
<td></td>
<td>SAS Spawned Servers (sassrv)</td>
<td>On Windows Vista, Windows 7, and Windows Server 2008 only: Read &amp; Execute, List Folder Contents, and Read*</td>
</tr>
<tr>
<td></td>
<td>All other users</td>
<td>No access</td>
</tr>
<tr>
<td><strong>SASApp subdirectories : PooledWorkspaceServer, StoredProcessServer</strong></td>
<td>SYSTEM, Administrators, and SAS Spawned Servers (sassrv)</td>
<td>Full Control*</td>
</tr>
<tr>
<td><strong>SASApp subdirectories : PooledWorkspaceServer \Logs, StoredProcessServer\Logs</strong></td>
<td>SYSTEM, Administrators, and SAS Spawned Servers (sassrv)</td>
<td>Full Control</td>
</tr>
<tr>
<td><strong>SASApp subdirectories:</strong></td>
<td>SYSTEM, Administrators, and SAS Spawned Servers (sassrv)</td>
<td>Full Control</td>
</tr>
<tr>
<td></td>
<td>• ConnectServer\Logs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Data\wrsdist</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Data\wrstemp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• PooledWorkspaceServer\sasuser</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• StoredProcessServer\sasuser</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• WorkspaceServer\Logs</td>
<td></td>
</tr>
</tbody>
</table>

| sasv9_meta.cfg file | SYSTEM and Administrators | Read and Write |
|  | Remove all other users and groups |

* The SAS Deployment Wizard automatically sets these permissions for sassrv.

** On Windows, this account is required for metadata server clustering on Windows.

*** On Windows, this account is required when using a central vault for the Deployment Backup and Recovery Tool or when using metadata server clustering.

**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.

For example, if the metadata server is run under the SAS Metadata Server: Service Login Account, then grant that account Full Control of `SASMeta\MetadataServer`, as shown in the preceding table.

- If you have configured metadata server clustering or middle-tier clustering, make sure to set the appropriate protections on all of the configured nodes.

- 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 SAS Intelligence Platform: System Administration Guide).

For details about the configuration directory structure, see “Overview of the Configuration Directory Structure” in 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 7.3  Default Operating System Protections on UNIX and z/OS**

<table>
<thead>
<tr>
<th>Directories</th>
<th>Users</th>
<th>Default Permissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>$SAS$-configuration-directory</td>
<td>SAS Installer</td>
<td>Read, Write, and Execute</td>
</tr>
<tr>
<td>$SAS$-configuration-directory/Lev1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lev1 subdirectories: Documents, ReportBatch, SASApp, SASMeta, Utilities, Web</td>
<td>All other users</td>
<td>Read and Execute</td>
</tr>
<tr>
<td>Lev1 subdirectories: ConnectSpawner</td>
<td>SAS Installer</td>
<td>Read, Write, and Execute</td>
</tr>
<tr>
<td>• Logs</td>
<td>All other users</td>
<td>No access</td>
</tr>
<tr>
<td>• ObjectSpawner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• SASApp/OLAPServer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• SASMeta/MetadataServer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• ShareServer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SASApp subdirectories : PooledWorkspaceServer, StoredProcessServer</td>
<td>SAS Installer</td>
<td>Read, Write, and Execute</td>
</tr>
<tr>
<td>sas group</td>
<td></td>
<td>Read and Execute</td>
</tr>
<tr>
<td>SASApp subdirectories :</td>
<td>SAS Installer</td>
<td>Read, Write, and Execute</td>
</tr>
<tr>
<td>• ConnectServer/Logs</td>
<td>sas group</td>
<td>Read, Write, and Execute</td>
</tr>
<tr>
<td>• Data/wrslnt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Data/wrstemp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• PooledWorkspaceServer/Logs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• PooledWorkspaceServer/sasuser</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• StoredProcessServer/Logs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• StoredProcessServer/sasuser</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• WorkspaceServer/Logs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• WorkspaceServer/Logs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Directories | Users | Default Permissions
---|---|---
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 *SAS Intelligence Platform: System Administration Guide*).
- For details about the configuration directory structure, see “Overview of the Configuration Directory Structure” in *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 7.4  Standard Setup Tasks

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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 *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 SAS Intelligence Platform: Data Administration Guide.

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish connectivity to your data sources.</td>
<td>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 SAS Intelligence Platform: Data Administration Guide.</td>
</tr>
<tr>
<td>Set up your metadata folder structure.</td>
<td>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 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.</td>
</tr>
</tbody>
</table>

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 7.5 Optional Setup Tasks

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install sas.servers as a boot script.</td>
<td>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 SAS Intelligence Platform: System Administration Guide.</td>
</tr>
<tr>
<td>Optimize the performance of the metadata server.</td>
<td>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 SAS Intelligence Platform: System Administration Guide. For other performance-related tasks, see “Managing Metadata Server Memory” in SAS Intelligence Platform: System Administration Guide.</td>
</tr>
<tr>
<td>Task</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 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 *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 *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 *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 *SAS Companion for z/OS*.  
  • If you want your BI output to always use the time zone of the server’s operating system, then you can specify the TIMEZONE system option in a restricted configuration file on the server tier. This option will prevent users from specifying different time zones. For details, see “TIMEZONE= System Option” and “Restricted Options” in *SAS System Options: Reference*. |
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>
<thead>
<tr>
<th>Task</th>
<th>Documentation Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start, stop, pause, resume, and refresh the servers that are used in the system.</td>
<td>“Operating Your Servers” in <em>SAS Intelligence Platform: System Administration Guide</em></td>
</tr>
<tr>
<td>Check the status of a server of or of a metadata repository.</td>
<td>“Checking the Status of Servers” in <em>SAS Intelligence Platform: System Administration Guide</em></td>
</tr>
<tr>
<td>Monitor the activity of servers.</td>
<td>“Monitoring the Activity of SAS Servers” in <em>SAS Intelligence Platform: System Administration Guide</em></td>
</tr>
<tr>
<td>Perform regular full backups of the metadata server.</td>
<td>“About Backing Up and Restoring Your SAS Content” in <em>SAS Intelligence Platform: System Administration Guide</em></td>
</tr>
<tr>
<td>Create a new metadata repository.</td>
<td>“Managing SAS Metadata Repositories” in <em>SAS Intelligence Platform: System Administration Guide</em></td>
</tr>
<tr>
<td>Promote individual metadata objects or groups of objects.</td>
<td>“Promotion Tools Overview” in <em>SAS Intelligence Platform: System Administration Guide</em></td>
</tr>
</tbody>
</table>

*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: Data Administration Guide.*
- *SAS Intelligence Platform: Desktop Application Administration Guide.*
- *SAS Intelligence Platform: Middle-Tier Administration Guide.*
- *Scheduling in SAS.*
Best Practices for Ensuring the Integrity of Your System

Keep Necessary Documentation Available

SAS administrators should keep the following documentation available for each environment:

• the operational document specific to your environment to assist in transferring information to new administrators or for vacation coverage
• an updated store of user IDs and passwords
• a complete log of changes and events that take place in the SAS environment. This log is helpful if issues are encountered. The following changes should be included in the log:
  • hostname changes
  • updates
  • patches

Start and Stop SAS Servers in the Correct Order

It is critical that the SAS servers be started and stopped in the recommended order as documented in “Overview of Server Operation” in SAS Intelligence Platform: System Administration Guide. The SAS_lsm tool described in Usage Note 58231: Utility that manages multi-tiered SAS services for Unix/Linux deployments is one of the options to ensure that this recommendation is followed consistently.

Back Up Your Environment

Maintain a regular schedule of deployment backups, as described in “Using the Deployment Backup and Recovery Tool” in SAS Intelligence Platform: System Administration Guide.

Use operating system commands to back up your file system contents on a regular basis when server processes are stopped. Verify that your backup process is successful. Verify that you can restore from your backup.

Maintain a daily schedule of metadata server backups, as described in “Backing Up and Recovering the SAS Metadata Server” in SAS Intelligence Platform: System Administration Guide.

Test Alert Email Configuration

SAS Metadata Server automatically sends an email to the designated email address when specific errors occur. This enables the SAS administrator to take timely action to correct the issue.
To test the alert email:

1. Log on to SAS Management Console.
2. Expand Metadata Manager and right-click the active server.
3. Select Properties and click Send Test Message.
4. The settings for the alert email are in the omaconfig.xml and sasv9.cfg files that are located in the `<sas-config-dir>/SASMeta/MetadataServer` directory.

For more information, see Backup and Alert Notifications in *SAS Environment Manager 2.5 Administration: User’s Guide*.

**Regularly Assess Your Environment for Available Hot Fixes**

SAS makes hot fixes available for the customer to download and install. For further information, see the following resources:

- SAS Hot Fix Analysis, Download and Deployment Tool
- SAS Hot Fix Announcements Communities Page
- How to learn about hot fixes to SAS software

**Update SAS Licenses and SSL certificates**

SAS licenses and SSL certificates must be updated before the expiration date.

**Monitor Your Environment for System Resource Limitations**

Based on the system resource limitations defined in the system requirements documentation, monitor your environment for available disk space, CPU, I/O, file descriptors, ulimits, and memory. Use system tools and the Environment Manager provided by SAS to monitor your server health and issue alerts as described in “Using SAS Environment Manager to Monitor SAS Servers” in *SAS Intelligence Platform: System Administration Guide*.

For Linux, see System Requirements for SAS 9.4 Foundation for Linux for x64.

For Windows, see System Requirements for SAS 9.4 Foundation for Microsoft Windows.

**Perform Regular Metadata Maintenance**

Perform regular maintenance of metadata as described in “Running the Metadata Analyze and Repair Tools” in *SAS Intelligence Platform: System Administration Guide*.

**Long-Running SAS Sessions**

To monitor long-running SAS sessions:

1. Check for long-running SAS sessions that might be abandoned and are no longer connected to a user session or a batch process.
2. Check SAS Enterprise Guide sessions that are left running overnight by users. These can lock the SAS tables.
These sessions might interfere with the nightly backup processes. Both these tasks can be successfully scripted. Your SAS consultants can help you find and adapt such scripts in your environment.

**Clean Up Abandoned SASWork Directories**

The SAS Cleanwork Utility for UNIX or Windows can be used for this task.

- For the UNIX environment, see “SAS Usage Utilities: CLEANWORK” in *SAS Companion for UNIX Environments*.
- For the Windows environment, see “Cleanwork Utility” in *SAS Companion for Windows*.

**Run Scripts to Archive Log Files**

Compress and archive log files periodically to save disk space. If you have servers that need to be restarted in order to rotate their logs, schedule a daily task to restart each of them. Log files are essential for troubleshooting issues, so retain the archived log files for a period of time to ensure that they are not needed by SAS Technical Support.

**SAS Visual Analytics Monitoring**

If you have installed SAS Visual Analytics on your machine, monitor the Autoload feature to ensure that it is periodically refreshing the tables when SAS Visual Analytics is running.

Monitor the audit reports to review information about the usage of your SAS Visual Analytics environment.

**SAS Grid Monitoring**

If you have a grid environment, monitor the distribution of the interactive and batch workload to ensure that the health of your grid is good. For further guidance, see *Introduction to SAS Grid Computing*.

**Maintenance of the Shared Services Database**

For more information about the shared services database, see the following resources:

- Tuning the PostgreSQL Data Server in *SAS 9.4 Web Applications: Tuning for Performance and Scalability*
- Monitoring Database Usage with SAS Environment Manager

**Maintenance of the PostgreSQL Database**

To perform regular maintenance on the PostgreSQL database, see *Usage Note 32781: Performing periodic, required maintenance on the PostgreSQL database.*
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.

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 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 SAS Intelligence Platform: System Administration Guide.

Use Usermods Files When Customizing Autoexec Files, Server Configuration Files, and Start-up 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.

Be Aware of the SAS Virtualization Environment Policy

Do not make changes that affect the responsiveness of virtual machines that are running SAS servers. For more information, see SAS Product Support for Virtualization Environments.
Appendix 1

SAS Migration Utility Reference

SAS Migration Utility Overview ......................................................... 135
Which Version of the Migration Utility Do I Use? .............................. 136
smu Command Syntax ................................................................... 136
smu Command Syntax Description .................................................. 137
smu Command Notes ...................................................................... 141

smu Command Examples ................................................................. 142
  Example 1: Basic, Two-Phase Migration Utility Invocation ............. 142
  Example 2: Two-Phase Migration Utility Invocation with Output Preferences . 143
  Example 3: Report-Only Migration Utility Invocation .................. 143
  Example 4: Migration Utility Invocation Using a Properties File .... 144
  Example 5: Migration Utility Invocation Using a Properties File on the WebDAV Tier ................. 145
  Example 6: Migration Utility Invocation When Two Tiers Are on the Same Machine .................. 145

Running the Migration Utility Using a Properties File ...................... 146
  Overview of Running the Migration Utility Using a Properties File .... 146
  How the Migration Utility Manages Passwords ............................ 146
  Run the Migration Utility Using a Properties File ......................... 146
  Sample Migration Utility Properties File ................................. 147

SAS Migration Utility Overview

The SAS Migration Utility is an Ant-based framework and set of SAS product extensions whose primary purpose is to output a package of your current SAS content—data and configuration—that the SAS Deployment Wizard will use when it installs and configures SAS 9.4. The migration utility framework consists of a two-phase process: an analyze phase, and a package phase.

In the analyze phase, the migration utility locates the SAS content required for migration, performs a validation to ensure the content can be reliably migrated, and saves the required information for the migration utility package phase. During the analyze phase, the migration utility also generates a migration analysis report that you can use to inventory and enumerate those SAS products found on your current SAS system to be eligible for automatic migration with the deployment wizard.
In the package phase, the migration utility searches the system and copies SAS content into a migration package that will be used by the deployment wizard as it installs and configures SAS 9.4.

For more information about how to use the SAS Migration Utility, see “Inventorying Your Current SAS Deployment” on page 18.

The following topics are contained in this section:

- “smu Command Syntax” on page 136
- “smu Command Syntax Description” on page 137
- “smu Command Notes” on page 141
- “smu Command Examples” on page 142
- “Running the Migration Utility Using a Properties File” on page 146

---

### Which Version of the Migration Utility Do I Use?

With SAS 9.4, there are different versions of the SAS Migration Utility. You should use the SAS Migration Utility version that matches your source system. You should choose the matching version from your new SAS Software Depot even if you already have a matching version in your existing SAS Software Depot. The table below maps the migration utility to the operating system that you are running and the SAS version from which you are migrating:

**Table A1.1 SAS Migration Utility Compatibility Chart**

<table>
<thead>
<tr>
<th>Your Current SAS Version</th>
<th>The Operating System of the Machine You Are Migrating...</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Windows 32-Bit</td>
</tr>
<tr>
<td>SAS 9.2</td>
<td>smu92_32.exe</td>
</tr>
<tr>
<td>SAS 9.3</td>
<td>smu93_32.exe</td>
</tr>
<tr>
<td>SAS 9.4</td>
<td>smu94_32.exe</td>
</tr>
</tbody>
</table>

---

### smu Command Syntax

**Windows:**

```
smu92_32 | smu92_x64 | smu93_32 | smu93_x64 | smu94_32 | smu94_x64
<br/>(<analyze>)
<br/>(<localhost> fully-qualified-host-name>)
<br/>(<properties> filename>)
<br/>(-sasconfigdir path -sasexedir path -sasproductdir path)
<br/>(-profile filename | -metadatabase host-name (<metadaport port>) -user userID -password password)
```
-outputdir path <-tier name> <-replace>
<-help>

UNIX:
smu92 -- | smu93 -- | smu94 --
<-analyze>
<-localhost fully-qualified-host-name>
<-properties filename>
-sasconfigdir path -sasexedir path -sasproductdir path
-profile filename | -metadatashost host-name <-metadataport port> -user userID -
password password
-outputdir path <-tier name> <-replace>
<-help>

z/OS:
smu92.zos -- | smu93.zos -- | smu94.zos --
<-analyze>
<-localhost fully-qualified-host-name>
<-properties filename>
-sasconfigdir path -sasexedir path -sasproductdir path
-profile filename | -metadatashost host-name <-metadataport port> -user userID -
password password
-outputdir path <-tier name> <-replace>
<-help>

**smu Command Syntax Description**

**--** is required by the migration utility when running on UNIX and z/OS. These are two hyphens (--) without any space between them.

*Default:* None

*Required:* Yes (for UNIX and z/OS only)

*Equivalent Property:* Not applicable

**-analyze** specifies that the migration utility perform only the first of its two execution phases: analyze. In the analyze phase, the migration utility locates the current SAS content required for migration, performs a validation to ensure the content can be reliably migrated, and saves the required information for the migration utility package phase. During the analyze phase, the migration utility also generates a migration analysis report that you can use to inventory and enumerate those SAS products found on your current SAS system to be eligible for automatic migration with the SAS Deployment Wizard.

*Default:* None

*Required:* No

*Equivalent Property:* Not applicable

When not specified, the migration utility performs both of its two phases, analyze and package. In the package phase, the migration utility uses information saved by the analyze phase to search the system and copy current SAS content into a migration package.
-localhost fully-qualified-host-name
   explicitly sets the machine host name on which the migration utility is running.
   Use -localhost for machines that have multiple network interfaces or a dynamic
   name. host-name should be a fully qualified host name for the machine. For
   example: -localhost myserver.example.com

Default: None
Required: No
Equivalent Property: SMU.localhost

-properties pathname
   specifies the absolute path and filename to a file that contains inputs for the
   migration utility in the form of properties. For example: -properties "C:\SAS
   Software Depot\utilities\smu\smu.properties".
   For more information, see “Running the Migration Utility Using a Properties File”
   on page 146.
   Enclose any paths containing spaces in double quotation marks.

Default: None
Required: No
Equivalent Property: Not applicable

-sasconfigdir path
   specifies the path to the current SAS configuration directory.
   Enclose any paths containing spaces in double quotation marks.
   Examples:
   "C:\SAS 9.4\Config\Lev1"
   /opt/sas/config/Lev1

Default: None
Required: Yes
Equivalent Property: SMU.config.dir

-sasexedir path
   specifies the current SAS path to the SAS executable (on Windows) or the top level
   SAS installation directory on (UNIX). If you are running the migration utility on a
   machine that does not contain the SAS executable or script, use -sasproductdir
   instead.
   Enclose any paths containing spaces in double quotation marks.
   Examples:
   "C:\Program Files\SASHome\SASFoundation\9.4"
   /opt/sas/SASHome/SASFoundation/9.4

Default: None
Required: No, when -sasproductdir is used
Equivalent Property: SMU.SASROOT

-sasproductdir path
   specifies the pathname to the top-level directory where the current SAS products are
   installed.
Enclose any paths containing spaces in double quotation marks.

Examples:

"C:\Program Files\SASHome"

/opt/sas/SASHome

Default: None

Required: No, when -sasedir is used

Equivalent Property: SMU.SASHOME

-profile filename

specifies the absolute pathname of a valid current SAS client connection profile that contains connection parameters containing unrestricted user credentials for the current SAS Metadata Server of the SAS deployment to be migrated. (A SAS client connection profile is used by clients such as SAS Management Console, SAS Information Map Studio, SAS Data Integration Studio, and SAS OLAP Cube Studio.)

Unless you specify an absolute path to the profile, the migration utility checks the machine's default SAS client connection profile directory.

By default, SAS stores connection profiles here:

- Windows:
  C:\Documents and Settings\user-ID\Workspaces

- UNIX and z/OS:
  $HOME/Workspaces

Enclose any paths containing spaces in double quotation marks.

Default: SAS connection profile directory (see earlier paths)

Required: No. (See “smu Command Notes” on page 141.)

Equivalent Property: SMU.profile

“Running the Migration Utility Using a Properties File” on page 146

-metadatashost host-name

specifies the name of the machine on which the current SAS Metadata Server resides. host-name is either a fully qualified host name or an IP address for the metadata server machine.

Default: None.

Required: No. (See “smu Command Notes” on page 141.)

Equivalent Property: SMU.host.metadata

See “Running the Migration Utility Using a Properties File” on page 146.

-metadataport port

specifies the port the migration utility uses to connect to the SAS Metadata Server. If no port is specified, the migration utility uses 8561 by default.

Default: 8561

Required: No

Equivalent Property: SMU.port.metadata
-user <domain">userID -password password
specifies the user ID and password for sasadm or another unrestricted user ID on the
current SAS Metadata Server. The migration utility accepts passwords that are
encoded using PROC PWENCODE.

CAUTION:
We recommend that you encode any passwords used in a migration utility
properties file. The migration utility supports the {sas002} method through
PROC PWENCODE. For more information, see “PWENCODE Procedure” in
Base SAS Procedures Guide.

(Specify the unrestricted user ID in the manner in which you would when you
normally run SAS. For example, if SAS has stored the user ID as domain-qualified,
and you specify it with the migration utility as unqualified, the connection fails.)

Default: None

Required: No. (See “smu Command Notes” on page 141.)

Equivalent Properties: SMU.user, SMU.password

See “Running the Migration Utility Using a Properties File” on page 146.

-outputdir path -replace
specifies the absolute path to the parent output directory where the migration utility
should write its output. If the directory does not exist, the migration utility creates it
for you.

If the specified directory already exists and contains information from a previous
migration utility invocation, the migration utility returns an error, unless you specify
the -replace option.

The migration utility writes the analysis report to SMU.Output.Dir/tier/
AnalysisReport.

Enclose any paths containing spaces in double quotation marks.

Default: None

Required: Yes

Equivalent Property: SMU.Output.Dir

-tier name -replace
specifies a name for the subdirectory (under the parent directory) where the
migration utility writes its migration analysis report and the migration package. In
addition, the migration utility appends an at sign (@) and the fully qualified host
name to the specified tier name directory (for example,
middle_tier@myhost.example.com).

Required when you have two tiers on the same machine (for example, the SAS
server tier and middle tier).

If the specified directory already exists and contains information from a previous
migration utility invocation, the migration utility returns an error, unless you specify
the -replace option.

If you omit -tier, the migration utility creates a directory using the fully qualified
host name.

Enclose any paths containing spaces in double quotation marks.

Default: fully qualified host name

Required: No (except when two tiers are on the same machine)
smu Command Notes

Follow these notes when running the SAS Software Migration Utility:

- The SAS Migration Utility command line has a 254-character limit. Command line input that exceeds this length causes the utility to fail. If your input exceeds 254 characters, use a migration utility properties file. For more information, see “Running the Migration Utility Using a Properties File” on page 146.

- The current SAS Metadata Server must be running when you invoke the migration utility.

- On SAS multiple-machine deployments, run the migration utility first on the machine hosting the SAS Metadata Server.

- On SAS deployments that use clustered metadata servers, run the migration utility on the first metadata server node. For more information, see “Packaging SAS Content on a Metadata Server Cluster” on page 41.

- You must run the migration utility from its executable directory.

By default, this is the smu-version subdirectory under the utilities directory in your SAS Software Depot.

Note: On UNIX and z/OS, if you have not already, remember to assign file Execute permissions to smu.sh before attempting to run the migration utility. For more information, refer to your UNIX or z/OS documentation.

- The migration utility must be run on every machine that is running SAS using the same output directory (SMU.Output.Dir).

For SAS multiple-machine deployments, we recommend that you install the utility on shared network storage that is accessible from every SAS machine to avoid having to install the migration utility separately on each machine.

- On SAS multiple-machine deployments, the migration utility must be able to write to (and read from) its output directory.

We recommend that the utility output directory be on shared network storage accessible to every SAS machine in the deployment.

- When specifying the metadata server to connect to, it is a best practice to use a fully qualified host name or an IP address. Do not refer to the metadata server as localhost or its IP equivalent (127.0.0.1), unless all of the machines in your SAS deployment are able to connect to the server using that host name.
In the migration utility properties, when specifying Windows paths, delimit directories with two backspaces (for example, `SMU.SASHOME=C:\Program Files\SASHome`).

On the migration utility command line, enclose any paths containing spaces in double quotation marks. (Paths containing spaces in properties files do not require double quotation marks.)

>Note: A backslash immediately followed by a double quotation marks ("\") is not allowed in the migration utility command line. Avoid ending Windows paths with a trailing backslash on the command line. (This limitation does not apply to migration utility property files.)

Metadata server connection information must be provided to the migration utility through one of the following methods:

- the connection-related command-line options (`-metadasthost`, `-user`, and so on.)

>Note: The migration utility accepts passwords that are encoded using PROC PWENCODE.

**CAUTION:**
We recommend that you encode any passwords used in a migration utility properties file. The migration utility supports the `{sas002}` method through PROC PWENCODE. For more information, see “PWENCODE Procedure” in Base SAS Procedures Guide.

- a migration utility properties file.
- a SAS client connection profile.

(The client connection profile must be created and saved on the machine on which you are running the migration utility.)

On UNIX, modify the PATH environment variable such that the directory containing the Java binary is the first JRE found. Verify your setting by executing from the UNIX shell prompt: `which java`

It is recommended that you use the `-replace` command-line option when invoking the migration utility. This ensures that output from any previous migration utility invocations that specified the same output directory and tier directory is overwritten.

---

**smu Command Examples**

**Example 1: Basic, Two-Phase Migration Utility Invocation**

In this example, on Windows (64-bit), the migration utility executes both its phases—creating a migration analysis report and a migration package. The migration utility uses information in the connection profile named `md1234.swa` to communicate with the SAS Metadata Server:

- Migrating from SAS 9.2 (64-bit)

  smu92_x64 -profile md1234 -sasconfigdir C:\SAS\BIServer\Lev1 -sasproductdir "C:\Program Files\SAS" -outputdir C:\SMU_packages\host1234 -replace
• Migrating from SAS 9.3 (64-bit)

```
smu93_x64 -profile md1234 -sasconfigdir C:\SAS\BIServer\Lev1
-sasproductdir "C:\Program Files\SASHome"
-outputdir C:\SMU_packages\host1234 -replace
```

• Migrating from SAS 9.4 (64-bit)

```
smu94_x64 -profile md1234 -sasconfigdir C:\SAS\BIServer\Lev1
-sasproductdir "C:\Program Files\SASHome"
-outputdir C:\SMU_packages\host1234 -replace
```

The -replace option is specified to make sure that any output from a previous migration utility session—that might have specified the same output directory and tier name—is overwritten.

**Example 2: Two-Phase Migration Utility Invocation with Output Preferences**

In this example, on Windows (32-bit), the migration utility executes both its phases and creates a migration analysis report and a migration package in an output directory named `server_tier@host1234.example.com` that is a child of a parent directory named `C:\SMU_packages`. The migration utility uses information in the connection profile named `md1234.swa` to communicate with the SAS Metadata Server:

• Migrating from SAS 9.2 (32-bit)

```
smu92_32 -profile md1234 -sasconfigdir C:\SAS\BIServer\Lev1
-sasproductdir "C:\Program Files\SAS"
-outputdir "C:\SMU_packages" -tier server_tier -replace
```

• Migrating from SAS 9.3 (32-bit)

```
smu93_32 -profile md1234 -sasconfigdir C:\SAS\BIServer\Lev1
-sasproductdir "C:\Program Files\SASHome"
-outputdir "C:\SMU_packages" -tier server_tier -replace
```

• Migrating from SAS 9.4 (32-bit)

```
smu94_32 -profile md1234 -sasconfigdir C:\SAS\BIServer\Lev1
-sasproductdir "C:\Program Files\SASHome"
-outputdir "C:\SMU_packages" -tier server_tier -replace
```

The -replace option is specified to make sure that any output from a previous migration utility session—that might have specified the same output directory and tier name—is overwritten.

**Example 3: Report-Only Migration Utility Invocation**

In this example, on UNIX, the migration utility executes its analyze phase only, and creates a migration analysis report in an output directory named `server_tier@host1234.example.com` that is a child of a parent directory named `/home/sas/smu_packages`. The migration utility uses information in the connection profile named `md1234.swa` to communicate with the SAS Metadata Server. The migration utility writes the analysis report to `SMU.Output.Dir/tier/AnalysisReport`:

• Migrating from SAS 9.2

```
./smu92 -- -sasconfigdir /opt/SAS/config/Lev1
-sasproductdir /opt/SAS -profile md1234
```
-outputdir "/home/sas/smu_packages" -tier server_tier
-replace -analyze

• Migrating from SAS 9.3
./smu93 -- -sasconfigdir /opt/SAS/config/Lev1
-sasproductdir /opt/SASHome -profile md1234
-outputdir "/home/sas/smu_packages" -tier server_tier
-replace -analyze

• Migrating from SAS 9.4
./smu94 -- -sasconfigdir /opt/SAS/config/Lev1
-sasproductdir /opt/SASHome -profile md1234
-outputdir "/home/sas/smu_packages" -tier server_tier
-replace -analyze

The -replace option is specified to make sure that any output from a previous migration utility session—that might have specified the same output directory and tier name—is overwritten.

Example 4: Migration Utility Invocation Using a Properties File

In this example, on UNIX, the migration utility executes both its phases and creates a migration analysis report and a migration package. All of the required inputs are supplied to the migration utility in the form of properties contained in a text file named myhost.properties:

• Migrating from SAS 9.2
./smu92 --
-properties
/opt/sas_9.3/SAS_Software_Depot/utilities/smu2/myhost.properties
-replace

• Migrating from SAS 9.3
./smu93 --
-properties
/opt/sas_9.3/SAS_Software_Depot/utilities/smu3/myhost.properties
-replace

• Migrating from SAS 9.4
./smu94 --
-properties
/opt/sas_9.3/SAS_Software_Depot/utilities/smu3/myhost.properties
-replace

The -replace option is specified to make sure that any output from a previous migration utility session—that might have used the same properties file—is overwritten. For more information, see “Running the Migration Utility Using a Properties File” on page 146.
Example 5: Migration Utility Invocation Using a Properties File on the WebDAV Tier

In this example, on UNIX, the migration utility executes both its phases and creates a migration analysis report and a migration package on the machine that contains WebDAV content. All of the required inputs are supplied to the migration utility in the form of properties contained in a text file named `myhost.properties`:

- Migrating from SAS 9.2
  ```
  ./smu92 --
  -properties
  /opt/sas_9.4/SAS_Software_Depot/utilities/smu2/myhost.properties
  -replace
  ```

- Migrating from SAS 9.3
  ```
  ./smu93 --
  -properties
  /opt/sas_9.4/SAS_Software_Depot/utilities/smu3/myhost.properties
  -replace
  ```

- Migrating from SAS 9.4
  ```
  ./smu94 --
  -properties
  /opt/sas_9.4/SAS_Software_Depot/utilities/smu3/myhost.properties
  -replace
  ```

The `-replace` option is specified to make sure that any output from a previous migration utility session—that might have used the same properties file—is overwritten. For more information, see “Running the Migration Utility Using a Properties File” on page 146.

Example 6: Migration Utility Invocation When Two Tiers Are on the Same Machine

In this example, on UNIX, the migration utility executes both its phases and creates a migration analysis report and a migration package on the machine that contains two tiers—the server tier and the middle tier. Because this machine hosts two tiers, you must run the migration utility twice.

The following commands show the server tier being packaged first. The `-tier` argument instructs the migration utility to write the package to `server_tier@host1234.example.com`. When the migration utility is run on this machine a second time (not shown), the `-tier` argument will contain a different value, `middle_tier`, which instructs the migration utility to write the package to `middle_tier@host1234.example.com`:

- Migrating from SAS 9.2
  ```
  ./smu92 -- -sasconfigdir /opt/SAS/config/Lev1
  -sasproductdir /opt/SAS -profile md1234
  -outputdir "/home/sas/smu_packages" -tier server_tier
  -replace
  ```
• Migrating from SAS 9.3
  ./smu93 -- -sasconfigdir /opt/SAS/config/Lev1
  -sasproductdir /opt/SASHome -profile md1234
  -outputdir "/home/sas/smu_packages" -tier server_tier
  -replace

• Migrating from SAS 9.4
  ./smu94 -- -sasconfigdir /opt/SAS/config/Lev1
  -sasproductdir /opt/SASHome -profile md1234
  -outputdir "/home/sas/smu_packages" -tier server_tier
  -replace

The -replace option is specified to make sure that any output from a previous migration utility session, which might have specified the same output directory and tier name, is overwritten.

Running the Migration Utility Using a Properties File

Overview of Running the Migration Utility Using a Properties File

The following topics are contained in this section:
• “How the Migration Utility Manages Passwords” on page 146
• “Run the Migration Utility Using a Properties File” on page 146
• “Sample Migration Utility Properties File” on page 147

How the Migration Utility Manages Passwords

Starting with the January 2015 release (SAS 9.4, Rev. 940_15w04), the SAS Migration Utility requires passwords specified in {sas002} encoding.

For passwords (supplied in properties containing the strings .password, .passwd, or .pwd), the migration utility does the following:
• automatically encodes clear-text passwords in {sas002} encoding
• removes passwords from smu.properties in the migration package

You can override this password behavior by setting SMU.cleartext.password.is_allowed to TRUE.

Run the Migration Utility Using a Properties File

An alternative to supplying SAS Software Migration Utility invocation options on the command line is to provide these options in the form of a properties file. You do this by creating a file containing values for the various migration utility properties that you want to use and saving this file in the same directory where the migration utility batch or script file resides. For information about product-specific properties, see “Review Product-Specific SAS Migration Utility Properties” on page 26.
Note: SAS supplies a migration utility template file (smu.properties.template) that provides examples for how to use various properties. You can find this file in your SAS Software Depot in the smu subdirectory underneath utilities.

When you run the migration utility, you reference your properties file with the -properties command-line option. For example:

```
smu92_32 -properties "C:\SAS Software Depot\utilities\smu2\mid_tier.properties" -replace
smu92_x64 -properties "C:\SAS Software Depot\utilities\smu2\mid_tier.properties" -replace
smu93_32 -properties "C:\SAS Software Depot\utilities\smu3\mid_tier.properties" -replace
smu93_x64 -properties "C:\SAS Software Depot\utilities\smu3\mid_tier.properties" -replace
smu94_32 -properties "C:\SAS Software Depot\utilities\smu4\mid_tier.properties" -replace
smu94_x64 -properties "C:\SAS Software Depot\utilities\smu4\mid_tier.properties" -replace
```

The migration utility enables you to use a combination of properties and command-line options. For example:

```
smu92_32 -analyze -profile myhost
-properties "C:\SAS Software Depot\utilities\smu2\mid_tier.properties" -replace
smu92_x64 -analyze -profile myhost
-properties "C:\SAS Software Depot\utilities\smu2\mid_tier.properties" -replace
smu93_32 -analyze -profile myhost
-properties "C:\SAS Software Depot\utilities\smu3\mid_tier.properties" -replace
smu93_x64 -analyze -profile myhost
-properties "C:\SAS Software Depot\utilities\smu3\mid_tier.properties" -replace
smu94_32 -analyze -profile myhost
-properties "C:\SAS Software Depot\utilities\smu4\mid_tier.properties" -replace
smu94_x64 -analyze -profile myhost
-properties "C:\SAS Software Depot\utilities\smu4\mid_tier.properties" -replace
```

In migration utility properties files, when specifying Windows paths or domains as a part of a user ID, you must escape any backslashes (\) with another backslash character. For example:

```
SMU.config.dir=C:\SAS\config\913BIP1atform\Lev1
SMU.user=mydomain\sasadm
```

The migration utility recognizes the number sign (#) as the comment character, when it is used as the first character in a line.

**Sample Migration Utility Properties File**

Here is the listing of a sample migration utility properties file with comments that describe each property:

**CAUTION:**

- We recommend that you encode any passwords used in a migration utility properties file. The migration utility supports the {sas002} method through PROC PWENCODE. For more information, see “PWENCODE Procedure” in Base SAS Procedures Guide.

**Note:** Migration utility properties are case-sensitive.

**CAUTION:**
To avoid unauthorized access to sensitive information, we recommend that the location where the migration utility writes package information (SMU.Output.Dir) be properly secured with file access permissions, readable by the migration utility and the SAS installer users only.

# Sample smu.properties file

# The following properties are needed by the SAS Migration Utility to properly analyze your SAS 9.4 system. Additional product-specific properties are described in the SAS Intelligence Platform: Migration Guide. All passwords should be supplied in {sas002} encoding. Use proc pwencode to get the encoded password.

# The configuration directory the migration utility will read from. This should usually be the "Lev1" directory. It will usually contain a SASMeta, Data and product directories.
SMU.config.dir=C:\SAS\Config\Lev1

# The SMU.SASROOT property should not be set manually without direct assistance from SAS Technical Support.
SMU.SASROOT=C:\Program Files\SASHome\SASFoundation\9.4

# The directory that is the install base of the SAS product set
SMU.SASHOME=C:\Program Files\SASHome

# Use this property to specify paths to skip migrating. The migration utility will ignore directories listed here. This property can be useful if your site has large amounts of data and you don't want to migrate all of it. The specified paths can be absolute or relative to the SAS configuration directory.
levconfig.exclude.dir.12BYTE.1=AppData
levconfig.exclude.dir.12BYTE.2=C:\SAS\Config94\Lev1\SASApp\SASEnvironment\test\test1
levconfig.exclude.dir.12BYTE.3=/opt/SAS/Config/Lev1/SASApp/SASEnvironment/test/test1

# The metadata server host. This must be defined for the migration utility to run successfully. The port defaults to 8561. If a different metadata port was used, this must be set to the correct port.
SMU.host.metadata=my.metadatahost.com
SMU.port.metadata=8561
# The metadata server administrative user and password.
# This must be an unrestricted user so all data can be
# read for metadata extraction. The password should be
# encoded using the \{sas002\} method.
#
# SMU.user=adminuser
# SMU.password=\{sas002\}ENCODEDPASSWORD
#
# A workspace profile is acceptable as an alternative
# to providing the host, port, user and password
# (if the password is in the profile). This can be
# just the profile name, which will look in the default
# location and the current working directory, or a full
# path to the profile.
#
# SMU.profile=MyServer
#
# The migration package output directory. It will be
# created if this is being run against the metadata server
# tier. Otherwise, it should already contain the results
# from your metadata server tier run and any other upstream
# tiers. The results from every tier of your deployment
# should be included in the same migration package.
#
# SMU.Output.Dir=C:\\SMU\\migrationPackage
#
# If the SMU is being run on a system with multiple network
# interfaces, or a dynamic host name, this property may
# need to be set to get the "right" name used for directory
# naming, etc.
#
# SMU.localhost=my.localhost.com
#
# The SCSAnalyzeTask will try to get the host and port of
# the Content Server web application from the metadata,
# but that source can be overridden by supplying the
# URL here. The host and port should be specified,
# the context should normally be as shown below.
#
# SMU.scs.url=http://localhost:8080/SASContentServer/admin
#
# The userid and password provided have to be unrestricted
# in the content server for the copy to be performed. If
# these are not set, the metadata user and password will
# be used. The password should be encoded using the \{sas002\} method.
#
# SMU.scs.user=
# SMU.scs.password=\{sas002\}ENCODEDPASSWORD
# These properties are used for SAS Content Servers that
# have had their repositories customized by the end user.
# If you don't understand these, chances are you don't
# need them. The password should be encoded using the {sas002} method.
#
#scs.jndi.jndiName=
#scs.jndi.driver=
#scs.jndi.jdbcUrl=
#scs.jndi.user=
#scs.jndi.pwd={sas002}ENCODEDPASSWORD
#scs.jndi.jdbcdir=

#

# This property is used to set up the trust store for
# SSL connections. If your content server or other
# web apps are using the https scheme, you need to
# either set this property, or set up the certificates
# in <java_home>/lib/security/jssecacerts or
# <java-home> /lib/security/cacerts. For more information
# see http://download.oracle.com/javase/1.5.0/docs/guide/security/jsse/JSSERefGuide.html
#
#javax.net.ssl.trustStore=

#
# Specify the user ID and password to use to connect to the
# Web Infrastructure Platform Shared Services database (which
# by default is named SharedServices).
# If the database server for the Web Infrastructure Platform is the SAS Web
# Infrastructure Platform Data Server, supply the credentials for the
# administrative user you created during deployment. (This user is by
# default also named SharedServices).
# If the database server for the Web Infrastructure Platform is a non-SAS
# DBMS (for example, Oracle or DB2) supply the credentials appropriate
# for connecting to the Shared Services database on that server.
# The password should be encoded using the {sas002} method.
#
#SMU.webinfpltfm.dbms.userid=myDatabaseUserID
#SMU.webinfpltfm.dbms.password={sas002}ENCODEDPASSWORD

#
# Specifies non-standard locations for SAS application data sets and
# catalogs for the migration utility to move.
#
# The utility packages these directories in the levconfig output
# folder in the "userdirs" subdirectory.
#
# List absolute paths or paths relative to the SAS configuration
# directory. Separate multiple paths with a comma.
#
#levconfig.user.dirs=my_SAS_solution_data_sets,my_SAS_solution_catalogs,
# C:\my_data\my_SAS_solution_misc

#
# This property should be set to true, if SMU will be run multiple
# times on the same machine because multiple tiers of SAS 9.4
# are deployed on the same machine.
#SMU.isMultipleTierMachine=true

# All passwords should be supplied in {sas002} encoding.
# The SAS Migration Utility will enforce this requirement.
# You may disable this security feature by setting the following
# property to TRUE. Setting this value allows SAS to read
# clear text passwords.
# SMU.cleartext.password.is_allowed=FALSE

SMU.SAS.version=9.4
# Product-Specific SAS Migration Utility Properties

## Product-Specific SAS Migration Utility Properties Overview

Some SAS products have unique properties that the SAS Migration Utility uses when creating a migration analysis report, or later in the process when the utility builds a migration package. Consult the topics in this section for migration utility properties that your SAS product might depend on.

- “SAS Analytics Platform Properties” on page 154
- “SAS Content Server Properties” on page 154
- “SAS Contextual Analysis Properties” on page 156
- “SAS Grid Control Server Properties ” on page 157
- “SAS IT Resource Management Properties” on page 157
- “SAS Model Manager Properties” on page 158
- “SAS Shared Services - SAS Web Infrastructure Platform Database Properties” on page 161
- “SAS Visual Analytics Properties” on page 164
- “SAS Web Report Studio Properties ” on page 166
SAS Analytics Platform Properties

The following tables describe unique properties for the SAS Analytics Platform applications that the SAS Migration Utility uses when creating a migration analysis report or when building a migration package. To use these properties, add them to your migration utility properties file. For more information, see “Running the Migration Utility Using a Properties File” on page 146.

This topic contains the following SAS Analytics Platform SAS tier migration utility properties:

- **SMU.apcore.dir property**
- **SMU.apcore.migration.is_enabled property**

The following table describes the SMU.apcore.dir property:

<table>
<thead>
<tr>
<th>Property</th>
<th>Examples</th>
<th>When to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMU.apcore.dir</td>
<td>SMU.apcore.dir=C:\Program Files\SAS\SASAPCore</td>
<td>To specify the SAS Analytics Platform applications installation directory.</td>
</tr>
</tbody>
</table>

The following table describes the SMU.apcore.migration.is_enabled property:

<table>
<thead>
<tr>
<th>Property</th>
<th>Examples</th>
<th>When to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMU.apcore.migration.is_enabled</td>
<td>SMU.apcore.migration.is_enabled=true</td>
<td>Set to true, when migrating SAS Analytics Platform applications.</td>
</tr>
</tbody>
</table>

SAS Content Server Properties

The following table describes a unique property for the SAS Content Server that the SAS Migration Utility uses when creating a migration analysis report or when building a migration package. To use this property, add it to your migration utility properties file. For more information, see “Running the Migration Utility Using a Properties File” on page 146.

This topic contains the following SAS Content Server SAS middle-tier migration utility properties:

- **SMU.scs.maxmemory**
- **SMU.scs.tempdir**
The following table describes the SMU.scs.maxmemory property:

**Table A2.3  SMU.scs.maxmemory Property**

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.scs.maxmemory</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SMU.scs.maxmemory=512</td>
</tr>
<tr>
<td>When to Use</td>
<td>When migrating the SAS Content Server (JCR) repository while the web application server is down, the migration utility uses SMU.scs.maxmemory to set the maximum heap size (in megabytes) of the Java process for the JCR repository. You should increase the default (512 MB) only when migrating very large content repositories.</td>
<td></td>
</tr>
</tbody>
</table>

The following table describes the SMU.scs.tempdir property:

**Table A2.4  SMU.scs.tempdir Property**

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.scs.tempdir</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SMU.scs.tempdir=/opt/area/with/space</td>
</tr>
<tr>
<td>When to use</td>
<td>When migrating the SAS Content Server (JCR) repository, the migration utility uses space in the default temporary directory. If more space is needed and is available on another device, this property bypasses the default directory and uses the specified directory for temporary storage.</td>
<td></td>
</tr>
</tbody>
</table>

The following table describes the SMU.scs.reposdir.absolute property:

**Table A2.5  SMU.scs.reposdir.absolute Property**

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.scs.reposdir.absolute</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SMU.scs.reposdir.absolute=C:\my_dav_server\my_content_repository</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SMU.scs.reposdir.absolute=/my_dav_server/my_content_repository</td>
</tr>
<tr>
<td>When to Use</td>
<td>When the SAS Content Server repository resides in a location other than the default (SAS-configuration-directory/AppData/SASContentServer/Repository). Use a complete path to the repository. If both SMU.scs.reposdir.absolute and SMU.scs.reposdir.relative are specified, the SAS Migration Utility uses the absolute path and ignores the relative one.</td>
<td></td>
</tr>
</tbody>
</table>

The following table describes the SMU.scs.reposdir.relative property:

---

- SMU.scs.reposdir.absolute
- SMU.scs.reposdir.relative

The following table describes the SMU.scs.maxmemory property:

**Table A2.3  SMU.scs.maxmemory Property**

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.scs.maxmemory</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SMU.scs.maxmemory=512</td>
</tr>
<tr>
<td>When to Use</td>
<td>When migrating the SAS Content Server (JCR) repository while the web application server is down, the migration utility uses SMU.scs.maxmemory to set the maximum heap size (in megabytes) of the Java process for the JCR repository. You should increase the default (512 MB) only when migrating very large content repositories.</td>
<td></td>
</tr>
</tbody>
</table>

The following table describes the SMU.scs.tempdir property:

**Table A2.4  SMU.scs.tempdir Property**

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.scs.tempdir</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SMU.scs.tempdir=/opt/area/with/space</td>
</tr>
<tr>
<td>When to use</td>
<td>When migrating the SAS Content Server (JCR) repository, the migration utility uses space in the default temporary directory. If more space is needed and is available on another device, this property bypasses the default directory and uses the specified directory for temporary storage.</td>
<td></td>
</tr>
</tbody>
</table>

The following table describes the SMU.scs.reposdir.absolute property:

**Table A2.5  SMU.scs.reposdir.absolute Property**

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.scs.reposdir.absolute</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SMU.scs.reposdir.absolute=C:\my_dav_server\my_content_repository</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SMU.scs.reposdir.absolute=/my_dav_server/my_content_repository</td>
</tr>
<tr>
<td>When to Use</td>
<td>When the SAS Content Server repository resides in a location other than the default (SAS-configuration-directory/AppData/SASContentServer/Repository). Use a complete path to the repository. If both SMU.scs.reposdir.absolute and SMU.scs.reposdir.relative are specified, the SAS Migration Utility uses the absolute path and ignores the relative one.</td>
<td></td>
</tr>
</tbody>
</table>

The following table describes the SMU.scs.reposdir.relative property:
Table A2.6  SMU.scs.reposdir.relative Property

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.scs.reposdir.relative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>SMU.scs.reposdir.relative=my_content_repository</td>
</tr>
<tr>
<td></td>
<td>SMU.scs.reposdir.relative=my_content_repository</td>
</tr>
</tbody>
</table>

When to Use

When the SAS Content Server repository resides in a location other than the default (SAS-configuration-directory/AppData/SASContentServer/Repository).

SMU.scs.reposdir.relative specifies a path that is relative to SAS-configuration-directory/AppData/SASContentServer/Repository.

If both SMU.scs.reposdir.absolute and SMU.scs.reposdir.relative are specified, the SAS Migration Utility uses the absolute path and ignores the relative one.

---

SAS Contextual Analysis Properties

The following table describes a unique property for the SAS Contextual Analysis that the SAS Migration Utility uses when creating a migration analysis report or when building a migration package. To use this property, add it to your migration utility properties file. For more information, see “Running the Migration Utility Using a Properties File” on page 146.

This topic contains the following SAS Contextual Analysis migration utility properties:

- SMU.txtansvc.dbms.userid
- SMU.txtansvc.dbms.password

The following table describes the SMU.txtansvc.dbms.userid property:

Table A2.7  SMU.txtansvc.dbms.userid Property

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.txtansvc.dbms.userid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples</td>
<td>SMU.txtansvc.dbms.userid=myDatabaseUserID</td>
</tr>
</tbody>
</table>

When to Use

For use when migrating SAS Contextual Analysis

To export the SAS Contextual Analysis database to the migration package. Specify a valid user ID with which the migration utility can use a JDBC connection to access the database.

The following table describes the SMU.txtansvc.dbms.password property:

CAUTION:

We recommend that you encode any passwords used in a migration utility properties file. The migration utility supports the {sas002} method through PROC PWENCODE. For more information, see “PWENCODE Procedure” in Base SAS Procedures Guide.
Table A2.8  SMU.txtansvc.dbms.password Property

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.txtansvc.dbms.password</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples</td>
<td>SMU.txtansvc.dbms.password={SAS002}DBCC571245AD0B31433834F80BD2B99E16B3C969</td>
</tr>
<tr>
<td>When to Use</td>
<td>For use when migrating SAS Contextual Analysis</td>
</tr>
<tr>
<td></td>
<td>The password for the user ID with which the migration utility uses a JDBC connection to access the SAS Contextual Analysis database. You can use regular text or encode the password using PROC PWENCODE and the {sas002} method.</td>
</tr>
</tbody>
</table>

SAS Grid Control Server Properties

The following table describes a unique property for the SAS grid control server that the SAS Migration Utility uses when creating a migration analysis report or when building a migration package. To use this property, add it to your migration utility properties file. For more information, see “Running the Migration Utility Using a Properties File” on page 146.

The following table describes the SMU.grid.appservers property:

Table A2.9  SMU.grid.appservers Property

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.grid.appservers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>SMU.grid.appservers=SASMeta,SASApp,SASApp2</td>
</tr>
<tr>
<td>When to Use</td>
<td>When multiple SAS grids are defined in a single metadata server.</td>
</tr>
<tr>
<td></td>
<td>Multiple grids are indicated by the presence of more than one grid monitoring server with each referencing different machines. Use SAS.grid.appservers to identify which SAS Application Servers (and their logical grid servers) should be migrated with the grid monitoring server that references this machine.</td>
</tr>
<tr>
<td></td>
<td>SMU.grid.appservers contains a comma-separated list of SAS Application Server names that should be migrated with this machine. The default value is a NULL string.</td>
</tr>
</tbody>
</table>

SAS IT Resource Management Properties

The following tables describe unique properties for SAS IT Resource Management for the SAS middle tier. The SAS Migration Utility uses these properties when creating a migration analysis report or when building a migration package. To use these properties, add them to your migration utility properties file. For more information, see “Running the Migration Utility Using a Properties File” on page 146.
This topic contains the following SAS IT Resource Management middle-tier migration utility properties:

- SMU.itrmmitid.dbms.userid
- SMU.itrmmitid.dbms.password

The following table describes the SMU.itrmmitid.dbms.userid property:

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.itrmmitid.dbms.userid Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples</td>
<td>SMU.itrmmitid.dbms.userid=myDatabaseUserID</td>
</tr>
<tr>
<td>When to Use</td>
<td>For use when migrating any release of SAS IT Resource Management on SAS 9.4 to any other release of SAS IT Resource Management on SAS 9.4. To export the SAS IT Resource Management ITRM database to the migration package. Specify a valid user ID with which the migration utility can use a JDBC connection to access the database.</td>
</tr>
</tbody>
</table>

The following table describes the SMU.itrmmitid.dbms.password property:

**CAUTION:**

We recommend that you encode any passwords used in a migration utility properties file. The migration utility supports the \{sas002\} method through PROC PWENCODE. For more information, see “PWENCODE Procedure” in Base SAS Procedures Guide.

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.itrmmitid.dbms.password Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples</td>
<td>SMU.itrmmitid.dbms.password={SAS002}DBCC571245AD0B31433834F80BD2B99E16B3C969</td>
</tr>
<tr>
<td>When to Use</td>
<td>For use when migrating any release of SAS IT Resource Management on SAS 9.4 to any other release of SAS IT Resource Management on SAS 9.4. The password for the user ID with which the migration utility uses a JDBC connection to access the SAS IT Resource Management ITRM database. You can use regular text or encode the password using PROC PWENCODE and the {sas002} method.</td>
</tr>
</tbody>
</table>

### SAS Model Manager Properties

The following tables describe unique properties for SAS Model Manager that the SAS Migration Utility uses when creating a migration analysis report or when building a migration package. To use these properties, add them to your migration utility properties file. In the SAS Deployment Wizard, the database is named “SAS Model Manager Database” for SAS Model Manager 12.3, and it is named “SAS Decision Manager
Database” for SAS Model Manager 13.1 and later. For more information, see “Running the Migration Utility Using a Properties File” on page 146.

The values for the SAS Migration Utility properties can be found in SAS Management Console. Select the Folders tab and expand System ⇒ Applications ⇒ SAS Model Manager Mid-Tier. Select the Model Manager Mid-Tier <version> folder, right-click the Model Manager-Mid-Tier <version> application object, and then select Properties ⇒ Configuration. The prefix for the configuration properties that are equivalent to the SAS Migration Utility properties is dbms.mmapi. For more information, see SAS Model Manager Migration Guide.

This topic contains the following Model Manager migration utility properties:

- mmapi.dbms.data.name
- SMU.mmapi.dbms.userid
- SMU.mmapi.dbms.password
- mmapi.data.dbms.type
- SMU.mmapi.dbms.host
- SMU.mmapi.dbms.port
- SMU.mmapi.jdbc.driver

The following table describes the mmapi.dbms.data.name property:

<table>
<thead>
<tr>
<th>Property</th>
<th>mmapi.dbms.data.name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The configuration property in SAS Management Console is named dbms.mmapi.name.</td>
</tr>
<tr>
<td>Examples</td>
<td>mmapi.dbms.data.name=MdlMgrDB</td>
</tr>
<tr>
<td>When to Use</td>
<td>For use when migrating SAS Model Manager 12.3 or later to the same version or a later version.</td>
</tr>
<tr>
<td></td>
<td>To export the SAS Model Manager database to the migration package. Specify a valid database name with which the migration utility can use a JDBC connection to access the database.</td>
</tr>
</tbody>
</table>

The following table describes the SMU.mmapi.dbms.userid property:

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.mmapi.dbms.userid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The configuration property in SAS Management Console is named dbms.mmapi.userid.</td>
</tr>
<tr>
<td>Examples</td>
<td>SMU.mmapi.dbms.userid=myDatabaseUserID</td>
</tr>
<tr>
<td>When to Use</td>
<td>For use when migrating SAS Model Manager 12.3 or later to the same version or a later version.</td>
</tr>
<tr>
<td></td>
<td>To export the SAS Model Manager database to the migration package. Specify a valid user ID with which the migration utility can use a JDBC connection to access the database.</td>
</tr>
</tbody>
</table>
The following table describes the SMU.mmapi.dbms.password property:

**CAUTION:**
We recommend that you encode any passwords used in a migration utility properties file. The migration utility supports the \{sas002\} method through **PROC PWENCODE**. For more information, see “**PWENCODE Procedure**” in Base SAS Procedures Guide.

**Table A2.14** SMU.mmapi.dbms.password Property

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.mmapi.dbms.password</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples</td>
<td>{SAS002}DBCC571245AD0B31433834F80BD2B99E16B3C969</td>
</tr>
</tbody>
</table>

**When to Use**
For use when migrating SAS Model Manager 12.3 or later to the same version or a later version.

The password for the user ID with which the migration utility uses a JDBC connection to access the SAS Model Manager database. You can use regular text or encode the password using PROC PWENCODE and the \{sas002\} method.

**Table A2.15** mmapi.data.dbms.type Property

<table>
<thead>
<tr>
<th>Property</th>
<th>mmapi.data.dbms.type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples</td>
<td>mmapi.data.dbms.type=oracle</td>
</tr>
</tbody>
</table>

**When to Use**
For use when migrating SAS Model Manager 12.3 or later to the same version or a later version.

To export the SAS Model Manager database to the migration package. Specify a valid database type with which the migration utility can use a JDBC connection to access the database.

**Table A2.16** SMU.mmapi.dbms.host Property

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.mmapi.dbms.host</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples</td>
<td>SMU.mmapi.dbms.host=myDatabaseHost</td>
</tr>
</tbody>
</table>

**When to Use**
For use when migrating SAS Model Manager 12.3 or later to the same version or a later version.

To export the SAS Model Manager database to the migration package. Specify a valid host name with which the migration utility can use a JDBC connection to access the database.
### Table A2.17  SMU.mmapi.dbms.port Property

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.mmapi.dbms.port</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The configuration property in SAS Management Console is named dbms.mmapi.port.</td>
</tr>
</tbody>
</table>

| Examples | SMU.mmapi.dbms.port=1521 |

<table>
<thead>
<tr>
<th>When to Use</th>
<th>For use when migrating SAS Model Manager 12.3 or later to the same version or a later version.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To export the SAS Model Manager database to the migration package. Specify a valid port number with which the migration utility can use a JDBC connection to access the database.</td>
</tr>
</tbody>
</table>

### Table A2.18  SMU.mmapi.jdbc.driver Property

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.mmapi.jdbc.driver</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The configuration property in SAS Management Console is named dbms.mmapi.jdbc.dir.</td>
</tr>
</tbody>
</table>

| Examples | SMU.mmapi.jdbc.driver ="C:\SAS\Config\Lev1\Web\Applications\SASWIPServices9.4\JDBCDrivers" |
|          | SMU.mmapi.jdbc.driver=/data/install/oracle_jdbc |

<table>
<thead>
<tr>
<th>When to Use</th>
<th>For use when migrating SAS Model Manager 12.3 or later to the same version or a later version.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To export the SAS Model Manager database to the migration package. Specify a valid directory path to the database JDBC driver JAR files.</td>
</tr>
</tbody>
</table>

---

**SAS Shared Services - SAS Web Infrastructure Platform Database Properties**

The following tables describe unique properties for the SAS Shared Services (SAS 9.2) and SAS Web Infrastructure Platform Database (SAS 9.3 and SAS 9.4) that the SAS Migration Utility uses when creating a migration analysis report or when building a migration package. To use these properties, add them to your migration utility properties file. For more information, see “Running the Migration Utility Using a Properties File” on page 146.

This topic contains the following SAS Shared Services migration utility properties:

- `webinfpltfm.dbms.exporter.jvm.max.heap.option`
- `webinfpltfm.dbms.exporter.jvm.init.heap.option`
- `SMU.webinfpltfm.dbms.userid`
- `SMU.webinfpltfm.dbms.password`
- `dbms.webinfpltfm.is_usingschemapattern`
The following table describes the `webinfpltfm.dbms.exporter.jvm.max.heap.option` property:

<table>
<thead>
<tr>
<th>Property</th>
<th>Example</th>
<th>When to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>webinfpltfm.dbms.exporter.jvm.max.heap.option</td>
<td>webinfpltfm.dbms.exporter.jvm.max.heap.option=-Xmx500m</td>
<td>When migrating SAS Web Infrastructure Platform Database and you need to set the maximum heap size of the Java process for the exporter. Use m to specify megabytes and g to specify gigabytes.</td>
</tr>
</tbody>
</table>

The following table describes the `webinfpltfm.dbms.exporter.jvm.init.heap.option` property:

<table>
<thead>
<tr>
<th>Property</th>
<th>Example</th>
<th>When to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>webinfpltfm.dbms.exporter.jvm.init.heap.option</td>
<td>webinfpltfm.dbms.exporter.jvm.init.heap.option=-Xms500m</td>
<td>When migrating SAS Web Infrastructure Platform Database and you need to set the initial heap size of the Java process for the exporter. Use m to specify megabytes and g to specify gigabytes.</td>
</tr>
</tbody>
</table>

The following table describes the `SMU.webinfpltfm.dbms.userid` property:

<table>
<thead>
<tr>
<th>Property</th>
<th>Example</th>
<th>When to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMU.webinfpltfm.dbms.userid</td>
<td>SMU.webinfpltfm.dbms.userid=SharedServices</td>
<td>To export the SAS Shared Services database to the migration package. Specify a valid user ID with which the migration utility can use a JDBC connection to access the database. For more information, see “Complete a Migration Utility Checklist” on page 19.</td>
</tr>
</tbody>
</table>

The following table describes the `SMU.webinfpltfm.dbms.password` property:

**CAUTION:**
We recommend that you encode any passwords used in a migration utility properties file. The migration utility supports the {sas002} method through PROC PWENCODE. For more information, see “PWENCODE Procedure” in Base SAS Procedures Guide.

Table A2.22  SMU.webinfpltfm.dbms.password Property

<table>
<thead>
<tr>
<th>Property</th>
<th>Example</th>
<th>When to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMU.webinfpltfm.dbms.password</td>
<td>SMU.webinfpltfm.dbms.password={sas002}DBCC571245AD0B31433834F80BD2B99E16B3C969</td>
<td>The password for the user ID with which the migration utility uses a JDBC connection to access the SAS Shared Services database. You can use regular text or encode the password using PROC PWENCODE and the {sas002} method.</td>
</tr>
</tbody>
</table>

The following table describes the dbms.webinfpltfm.is_usingschemapattern property:

Table A2.23  dbms.webinfpltfm.is_usingschemapattern Property

<table>
<thead>
<tr>
<th>Property</th>
<th>Example</th>
<th>When to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>dbms.webinfpltfm.is_usingschemapattern</td>
<td>dbms.webinfpltfm.is_usingschemapattern=true</td>
<td>If the database user ID used to access the SAS Web Infrastructure Platform Database can read multiple database tables from different schemas, then an additional schema pattern or catalog property must be specified to uniquely query the table column metadata. Set dbms.webinfpltfm.is_usingschemapattern to true if multiple tables with the same name exist in the SAS Web Infrastructure Platform Database. Use in conjunction with dbms.webinfpltfm.schemapattern.</td>
</tr>
</tbody>
</table>

The following table describes the dbms.webinfpltfm.schemapattern property:

Table A2.24  dbms.webinfpltfm.schemapattern Property

<table>
<thead>
<tr>
<th>Property</th>
<th>Example</th>
<th>When to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>dbms.webinfpltfm.schemapattern</td>
<td>dbms.webinfpltfm.schemapattern=schema</td>
<td>If the database user ID used to access the SAS Web Infrastructure Platform Database can read multiple database tables from different schemas, then an additional schema pattern or catalog property must be specified to uniquely query the table column metadata. Specify the schema or catalog name. Use in conjunction with dbms.webinfpltfm.is_usingschemapattern.</td>
</tr>
</tbody>
</table>
SAS Visual Analytics Properties

The following tables describe unique properties for SAS Visual Analytics that the SAS Migration Utility uses when creating a migration analysis report or when building a migration package. To use these properties, add them to your migration utility properties file. For more information, see “Running the Migration Utility Using a Properties File” on page 146.

This topic contains the following SAS Visual Analytics migration utility properties:

- **SMU.webapp.bisrvmid.dbms.userid**
- **SMU.webapp.bisrvmid.dbms.password**
- **SMU.bihpgrdc.lasr.host.name**
- **SMU.bihpgrdc.private.lasr.port**
- **SMU.bihpgrdc.public.lasr.port**

The following table describes the SMU.webapp.bisrvmid.dbms.userid property:

<table>
<thead>
<tr>
<th>Property</th>
<th>SMU.webapp.bisrvmid.dbms.userid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>SMU.webapp.bisrvmid.dbms.userid=vatadm</td>
</tr>
</tbody>
</table>

**When to Use**

For use when migrating to Visual Analytics 6.2, 6.4, 7.1, or 7.2.

To export the SAS Web Infrastructure database to the migration package. Specify a valid user ID with which the migration utility can use a JDBC connection to access the database. For more information, see “Complete a Migration Utility Checklist” on page 19.

**How to Locate**

- In SAS Management Console, select the **Folders** tab and expand **System ➔ Applications ➔ SAS Visual Analytics Services ➔ Visual Analytics Services release-number**.
- In the right pane, select **Visual Analytics Services release-number** and right-click **Properties ➔ Configuration**.
- In the **Name** column, locate **webapp.bisrvmid.dbms.userid**.
- The value to use for SMU.webapp.bisrvmid.dbms.userid is located in the **Value** column.

The following table describes the SMU.webapp.bisrvmid.dbms.password property:

**CAUTION:**

We recommend that you encode any passwords used in a migration utility properties file. The migration utility supports the {sas002} method through PROC PWENCODE. For more information, see “PWENCODE Procedure” in Base SAS Procedures Guide.
Table A2.26  SMU.webapp.bisrvmid.dbms.password Property

<table>
<thead>
<tr>
<th>Property</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMU.webapp.bisrvmid.dbms.password</td>
<td>={SAS002}DBCC571245AD0B31433834F80BD2B99E16B3C969</td>
</tr>
</tbody>
</table>

When to Use
- For use when migrating to Visual Analytics 6.2, 6.4, 7.1, or 7.2.
- The password for the user ID with which the migration utility uses a JDBC connection to access the SAS Web Infrastructure database. You can use regular text or encode the password using PROC PWENCODE and the \{sas002\} method.

The following table describes the SMU.bihpgrdc.lasr.host.name property:

Table A2.27  SMU.bihpgrdc.lasr.host.name Property

<table>
<thead>
<tr>
<th>Property</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMU.bihpgrdc.lasr.host.name</td>
<td>=my_new_lasr_machine.example.com</td>
</tr>
</tbody>
</table>

When to Use
- Use this property if you have changed your SAS LASR Analytic Server machine after your initial deployment.
- For use when migrating SAS Visual Analytics 6.2 or later.

The following table describes the SMU.bihpgrdc.private.lasr.port property:

Table A2.28  SMU.bihpgrdc.private.lasr.port Property

<table>
<thead>
<tr>
<th>Property</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMU.bihpgrdc.private.lasr.port</td>
<td>=10011</td>
</tr>
</tbody>
</table>

When to Use
- Use this property if you have changed your SAS LASR Analytic Server ports after your initial deployment.
- For use when migrating SAS Visual Analytics 6.2 or later.

The following table describes the SMU.bihpgrdc.public.lasr.port property:

Table A2.29  SMU.bihpgrdc.public.lasr.port Property

<table>
<thead>
<tr>
<th>Property</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMU.bihpgrdc.public.lasr.port</td>
<td>=10031</td>
</tr>
</tbody>
</table>

When to Use
- Use this property if you have changed your SAS LASR Analytic Server ports after your initial deployment.
- For use when migrating SAS Visual Analytics 6.2 or later.
SAS Web Report Studio Properties

The following tables describe unique properties for SAS Web Report Studio that the SAS Migration Utility uses when creating a migration analysis report or when building a migration package. To use these properties, add them to your migration utility properties file. For more information, see “Running the Migration Utility Using a Properties File” on page 146.

This topic contains the following SAS Web Report Studio migration utility properties:

- citationweb.war.dir
- citationweb.war.file

The following table describes the citationweb.war.dir property:

<table>
<thead>
<tr>
<th>Property</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>citationweb.war.dir</td>
<td>C:\My Config\SAS\SASWebReportStudio\3.1</td>
</tr>
<tr>
<td></td>
<td>/my_config/SAS/SASWebReportStudio/3.1</td>
</tr>
</tbody>
</table>

When to Use: When SAS Web Report Studio is not configured in the standard location, which is `SAS-configuration-directory\web\webapps`.

The following table describes the citationweb.war.file property:

<table>
<thead>
<tr>
<th>Property</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>citationweb.war.file</td>
<td>C:\Program Files\SAS\SASWebReportStudio\3.1\SASWebReportStudio.war</td>
</tr>
</tbody>
</table>

When to Use: When migrating multiple instances of SAS Web Report Studio, the SAS Migration Utility, by default, bases the resulting configuration on the first instance found. To override this behavior, you can specify the fully qualified location of the SAS Web Report Studio WAR file or folder for the utility to use.
Recommended Reading

Here is the recommended reading list for this title:

- The migration guide for your SAS solution.
- *SAS Enterprise Miner: Administration and Configuration.*
- *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 Model Manager Migration Guide.*
- *SAS Web Applications: Tuning for Performance and Scalability*


- 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](http://support.sas.com/admintraining).

For a complete list of SAS publications, go to [sas.com/store/books](http://sas.com/store/books). If you have questions about which titles you need, please contact a SAS Representative:

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Email: [sasbook@sas.com](mailto:sasbook@sas.com)  
Web address: [sas.com/store/books](http://sas.com/store/books)
Glossary

**authentication**
the process of verifying the identity of a person or process for security purposes. Authentication is commonly used in providing access to software, and to data that contains sensitive information.

**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.

**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.

**data set**
See SAS data set.

**deploy**
to install an instance of operational SAS software and related components. The deployment process often includes configuration and testing as well.

**deployment plan**
information about what software should be installed and configured on each machine in a SAS deployment. A deployment plan is stored in a plan.xml file.

**foundation services**
See SAS Foundation Services.

**identity**
See metadata identity.

**Integrated Windows authentication (IWA)**
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 (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 FE80:0000:0000:0202:B3FF:FE1E:8329. As an alternative, a group of consecutive zeros could be replaced with two colons, as in FE80::0202:B3FF:FE1E:8329.

IPv6

IWA
See Integrated Windows authentication.

metadata identity (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.

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 spawner (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.

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.

promote
to copy selected metadata and associated content within or between planned deployments of SAS software. This promotion process is repeatable for a particular deployment. See also migrate.

promotion
the process of copying selected metadata and associated content within or between planned deployments of SAS software that could run different software releases. Methods of promotion include import and export processes, as well as explicit copies between two servers. This process is repeatable for a particular deployment.

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 data set (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 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 (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, information publishing, and stored process execution.

SAS IOM workspace (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 server that provides access to SAS Foundation features such as the SAS programming language and SAS 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 location in a file system 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 that is installed on the same computer.

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).

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.

single sign-on (SSO)
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.
spawner
   See object spawner.

spot
   the location for displaying a creative in an interactive channel. For example, a spot
   can be an identifiable area on a web page, email message, or mobile application.

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).

upgrade
   a type of software update that introduces new functionality. An upgrade generally
   involves a new release number.

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 Distributed Authoring and Versioning (WebDAV)
   a set of extensions to the HTTP protocol that enables users to collaboratively edit
   and manage files on remote web servers.

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's Internet
   Information Server (IIS).

workspace
   See SAS IOM workspace.
Index

Numbers
64-bit middle tier 32

A
administration tasks 121
    first-priority setup tasks 122
    ongoing tasks 130
    optional setup tasks 128
    standard setup tasks 127
ARM log information 128
    for SAS Data Integration Studio batch jobs 128
authentication 40
    automatic configuration of web application servers 32

B
backing up systems 38
backups
    process for 122
    batch jobs
    ARM log information for 128
best practices
    folders 134
    system integrity 131
branding, redefining 116
burst set library errors (z/OS) 110

C
calendar metadata, moving 46
change management
    for SAS Data Integration Studio 128
checklists
    for external user accounts 39
    for new server ports 42
    for SAS Migration Utility input 19
configuration
    automatic for web application servers 32
    information needed by SAS Deployment Wizard 87
logs 107
    modifying for processing servers 128
    securing 122
    updating files 110
configuration directory
    protections on UNIX and z/OS 126
    protections on Windows 123
Configuration Errors.html file 107
connectivity 128
content server
    properties for SAS Migration Utility 154

D
data quality transformations 112
data sources
    establishing connectivity to 128
datestamps for WebDAV content 117
deployment plans 33, 70
DeploymentSummary.html file 107
designing a migration 14
desktop applications
    Java heap memory for 128
DSX files for SAS BI Dashboard 116

E
Enterprise Miner
    WebDAV paths 117
external user accounts
    checklist for 39

F
first-priority setup tasks 122
flows 44
    determining user IDs for 44
    rescheduling 112
folders 134
    best practices 134
    SAS metadata folder structure 128
Folders tab
    SAS Management Console 134
full promotion 2

G
grid control server
properties for SAS Migration Utility 157

H
hardware
assessing for migration 16
heap memory 128

I
installation
automating for clients on multiple machines 103
interactive 75
SAS 9.4 69
third-party software 45
Instructions.html file 106
interactive installation and migration 75
inventorying a SAS deployment 18

J
Java heap memory 128
Java Runtime Environment (JRE) in Russia 45
JDBC DSX files for SAS BI Dashboard 116
jobs
redeploying for scheduling 111
scheduling 128
verifying after migration 112

L
logging 128
*See also ARM log information*
logs
configuration 107
migration 31

M
macro catalogs 109
maintenance patches 38
memory
Java heap memory 128
metadata
setting up folder structure 128
metadata repositories
metadata server and access to 134

P
partial promotion 2
performance
optimizing for metadata server 128
web applications 128
permissions
reviewing for WebDAV 117
plan files 33, 70
Platform Process Manager 46
Platform Suite for SAS
moving calendar metadata 46
ports checklist 42
post-migration tasks 106
pre-migration tasks 35
processing servers
modifying configuration of 128
promotion
compared to migration 5

preparing for migration 21
MetadataRepositories subdirectory 134
middle tier
migration considerations 32
post-migration tasks 115
migration
basic steps 11
compared to promotion 5
content types eligible for 7
defined 5
designing 14
interactive 75
post-migration tasks 106
pre-migration tasks 35
requirements for 8
SAS 9.2 content 69
SAS 9.3 content 69
tools for 6
validating 119
migration analysis reports 26
migration logs 31
migration packages 36
creating 63
multiple machine deployments 74
multiple-machine deployments
automating client installation 103

O
ongoing system administration tasks 130
operating system
configuration directory protections,
UNIX and z/OS 126
configuration directory protections,
Windows 123
optional setup tasks 128

post-migration tasks 106
pre-migration tasks 35
requirements for 8
SAS 9.2 content 69
SAS 9.3 content 69
tools for 6
validating 119
migration analysis reports 26
migration logs 31
migration packages 36
creating 63
multiple machine deployments 74
multiple-machine deployments
automating client installation 103

P
partial promotion 2
performance
optimizing for metadata server 128
web applications 128
permissions
reviewing for WebDAV 117
plan files 33, 70
Platform Process Manager 46
Platform Suite for SAS
moving calendar metadata 46
ports checklist 42
post-migration tasks 106
pre-migration tasks 35
processing servers
modifying configuration of 128
promotion
compared to migration 5

preparing for migration 21
MetadataRepositories subdirectory 134
middle tier
migration considerations 32
post-migration tasks 115
migration
basic steps 11
compared to promotion 5
content types eligible for 7
defined 5
designing 14
interactive 75
post-migration tasks 106
pre-migration tasks 35
requirements for 8
SAS 9.2 content 69
SAS 9.3 content 69
tools for 6
validating 119
migration analysis reports 26
migration logs 31
migration packages 36
creating 63
multiple machine deployments 74
multiple-machine deployments
automating client installation 103

O
ongoing system administration tasks 130
operating system
configuration directory protections,
UNIX and z/OS 126
configuration directory protections,
Windows 123
optional setup tasks 128

P
partial promotion 2
performance
optimizing for metadata server 128
web applications 128
permissions
reviewing for WebDAV 117
plan files 33, 70
Platform Process Manager 46
Platform Suite for SAS
moving calendar metadata 46
ports checklist 42
post-migration tasks 106
pre-migration tasks 35
processing servers
modifying configuration of 128
promotion
compared to migration 5

preparing for migration 21
MetadataRepositories subdirectory 134
middle tier
migration considerations 32
post-migration tasks 115
migration
basic steps 11
compared to promotion 5
content types eligible for 7
defined 5
designing 14
interactive 75
post-migration tasks 106
pre-migration tasks 35
requirements for 8
SAS 9.2 content 69
SAS 9.3 content 69
tools for 6
validating 119
migration analysis reports 26
migration logs 31
migration packages 36
creating 63
multiple machine deployments 74
multiple-machine deployments
automating client installation 103

O
ongoing system administration tasks 130
operating system
configuration directory protections,
UNIX and z/OS 126
configuration directory protections,
Windows 123
optional setup tasks 128

P
partial promotion 2
performance
optimizing for metadata server 128
web applications 128
permissions
reviewing for WebDAV 117
plan files 33, 70
Platform Process Manager 46
Platform Suite for SAS
moving calendar metadata 46
ports checklist 42
post-migration tasks 106
pre-migration tasks 35
processing servers
modifying configuration of 128
promotion
compared to migration 5
content types eligible for 3
defined 2
tools for 2
properties file for SAS Migration Utility 24, 146

R
reports scheduling 128
requirements for migration 8
for SAS Migration Utility 22
roles for SAS Web Report Studio 115
rposmgr subdirectory 134

S
SAS Analytics Platform
application properties for SAS Migration Utility 161
properties for SAS Migration Utility 154
SAS BI Dashboard
JDBC DSX files 116
SAS Contextual Analysis
properties for SAS Migration Utility 156
SAS Data Integration Studio
ARM log information for jobs 128
change management for 128
SAS Deployment Wizard 6
configuration for web application servers 32
configuration information needed 87
creating SAS Software Depots 58
documents and reports 106
information needed for z/OS 84
interactive operation 70
non-interactive operation 70
SAS Download Manager
creating SAS Software Depots 53
SAS flows
See flows
SAS folders
See folders
SAS Information Delivery Portal
updating URLs for 117
SAS Management Console
Folders tab 134
SAS Metadata Server
metadata repository access and 134
optimizing performance and reliability 128
SAS Migration Utility 6, 135
creating a migration analysis report 26
creating migration packages 63
downloading 23
input values checklist 19
inventorying a SAS deployment 18
migration logs 31
properties file 24
requirements 22
running with a properties file 146
smu command syntax 136
SAS Software Depots 48
benefits of 49
best practices for 51
creating with SAS Deployment Wizard 58
creating with SAS Download Manager 53
installing third-party software 45
prerequisites for creating 52
SAS Web Report Studio
properties for SAS Migration Utility 166
reviewing user roles 115
scheduling
redeploying jobs for 111
rescheduling flows 112
security
best practices for system integrity 131
configuration directory protections,
UNIX and z/OS 126
configuration directory protections,
Windows 123
first-priority setup tasks 122
optional setup tasks 128
standard setup tasks 127
server logging 128
server tier
post-migration tasks 109, 110
servers
updating definitions for third-party software 108
setup tasks
first-priority 122
optional 128
standard 127
smu command
examples 142
notes 141
syntax 136
standard setup tasks 127
stored processes
updating archive package and WebDAV paths 111
system administration
ongoing tasks 130
system integrity
best practices for 131
T
tasks
See administration tasks
temporary directory
changing 75
test environment 128
themes, redefining 116
third-party software
  assessing for migration 16
  installing from Third-Party Software Website 45
  installing with a SAS Software Depot 45
  updating server definitions 108
Third-Party Software Website 45
tools for promotion 2

U
UNIX
  operating system protections 126
  smu command syntax 137
upgrading to SAS 9.2, approaches for 9
URLs
  updating for SAS Information Delivery Portal 117
user accounts
  authentication 40
  checklist for external user accounts 39
user IDs for flows 44
user roles for SAS Web Report Studio 115
users
  access management 127
  adding 127

W
web application servers 32
  automatic configuration 32
  configuration documentation for 32
web applications
  optimizing performance 128
WebDAV paths
  Enterprise Miner 117
Windows
  operating system protections 123
  smu command syntax 136

Z
z/OS
  burst set library errors 110
  information for SAS Deployment Wizard 84
  operating system protections 126
  smu command syntax 137
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