

Latest and Greatest: Best Practices for Migrating to SAS® 9.4

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ABSTRACT

SAS® customers benefit greatly when they are using the functionality, performance, and security available in the latest version of SAS. However, the task of moving all SAS collateral such as programs, data, catalogs, metadata (stored processes, maps, queries, reports, and so on), and content to SAS® 9.4 can seem daunting. This paper provides an overview of the steps required to move SAS collateral from systems based on SAS® 9.2 and SAS® 9.3 to the current release of SAS® 9.4.

INTRODUCTION

For the purposes of this paper, migration refers to the act of copying all configuration information, SAS data, and corollary artifacts such as SAS formats, SAS macros, reports, and so on) from one deployment to another. This is most often done when upgrading from an older release of SAS to the latest release of SAS, but this is not always the case. For example, migration is very helpful when a customer who has an existing deployment wishes to make a clone for the purposes of testing new customer-written reports or models or data transformations.

If I'm migrating to a new release of SAS, I like to think of the migration process as if I were moving to a very nice new house in a newer, nicer subdivision. The concepts are very similar.

1. You load all the contents of your old house, garage, garden shed, (perhaps even a pool house if you have a large SAS deployment) into well-organized boxes.
2. You neatly pack these boxes into a moving truck.
3. The truck is taken with all the boxes to the new house.
4. Once there, you unpack the contents into the appropriate location at your new property.

This paper lays out a very practical approach to migrating a large, multi-machine deployment to a new set of machines or to new locations on the same machines. I will identify what I believe is the safest and least complicated approach in a step-by-step manner.

Please note that this paper is a much abbreviated guide to migration and that all customers should familiarize themselves with the [SAS® 9.4 Intelligence Platform Migration Guide](#) before beginning their work. Then when you start your migration, you should follow along in the book as you perform each task. The book provides indispensable help with very specific details, which are beyond the scope of this overview. The book is available at the following URL

<http://go.documentation.sas.com/?docsetId=bimig&docsetTarget=titlepage.htm&docsetVersion=9.4&locale=en>

UNDERSTANDING THE GROUND RULES

Before we begin to plan for a migration, it's important to understand the basic tenets and the rules that are imposed.

As is the case with all software systems, compromises must be made between the amount of flexibility that is allowed in performing the task and the complexity that is imposed by allowing such flexibility. The migration process already involves many variables associated with changing the version of each software product, converting the underlying data structures to the new formats, and adapting the deployment to new operating system versions, servers, and databases. In order to limit the complexity of the process and maintain the sanity of the people performing the task, SAS has imposed some ground rules:

- All products and content contained in the source system must be migrated to the target system in unison. You cannot selectively migrate a subset of products found on the source system.
- All machines that are part of the source system deployment must be migrated to the target system. You cannot migrate a subset of the machines that collectively comprise a SAS deployment. (An exception can be made here when metadata servers or web application servers are run in a cluster of servers. In this case, you need to consider only the first machine of the metadata server or web application server cluster.)
- No changes are allowed to architectural topology. Your SAS products must continue to be distributed across logical machines in the same manner as they were on the source system. You cannot redistribute SAS products onto more or fewer machines on the target system.
- No changes are allowed in type of operating systems. Products on Windows must remain on Windows, and UNIX products must remain on UNIX. However, you can migrate from one Windows release to another or from one UNIX variant (for example, Solaris) to another (for example, Linux).

BEFORE YOU MIGRATE: PREPARING THE SOURCE SYSTEM

BACK UP THE SOURCE SYSTEM

I believe that the value of system backups cannot be overstated. At SAS, we test our software extensively. Quality is our highest priority. However whenever a system allows a high degree of end-user customizations, circumstances can arise where recovering from a backup can save considerable time and effort.

I personally make a complete backup of my entire machine every single night and before each of my frequent visits to the water cooler. Some might judge me to be excessively paranoid, but few people sleep more soundly each night than do I.

Specific instructions on how to do backups are provided in Chapter 2 of the [SAS® 9.4 Intelligence Platform Migration Guide](#) under the heading “Prepare Your Metadata Repositories”. Follow them closely and then treat yourself to a good night’s sleep.

CLEAN UP UNNECESSARY ARTIFACTS

As with any move, it makes no sense to move things that you will never need in the new location. Prior to migrating is a perfect time to clean up the attic, empty out the garage, and jettison unnecessary baggage.

Since the migration involves putting all the data and metadata associated with a SAS deployment into a package and then moving that package onto the target machines, it behooves us to attempt to minimize the size of this package.

In metadata, try to get rid of unneeded reports and information maps, users who no longer access the system, and anything that is no longer useful.

On the file system, logs tend to accumulate over time and can be quite large. Now is an excellent time to look at all the /Log directories in your configuration directory and remove any old, unnecessary ones. It’s not uncommon to see hundreds of megabytes of log files in a long running SAS deployment. These files will translate into many minutes spent drumming fingers on desks as these megabytes are packed and then unpacked.

LOOK BEFORE YOU LEAP: ANALYZING THE SOURCE SYSTEM

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. The SAS Migration Utility analyzes 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 utility also generates a migration analysis report. Using this report, you can determine those SAS products found on your current SAS system that are eligible for automatic migration. 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. It is always preferable to run the SAS Migration Utility that shipped with your target system order, but if you have not yet finalized the order process, the download option is acceptable for performing the initial analysis step. Note that a downloaded SAS Migration Utility is NOT allowed for creating the SMU package. Later we will stress when creating the package, you must run the SAS Migration Utility that was delivered with the software order intended for your target system.

To download the SAS Migration Utility, navigate to <http://support.sas.com/>. Click **View SAS Administrator resources** and then select **Downloads and Hotfixes**. Under SAS System Software, you will find the SAS Migration Utility. Choose the version number and operating system that matches those of the source system. If your source system is a SAS 9.3 system on 64-bit Microsoft Windows, you would choose as shown in [Display 1](#).

The screenshot shows the SAS Support website page for downloading the SAS Migration Utility. The page title is "SAS Downloads: SAS Migration Utility - Windows Internet Explorer". The URL is <http://support.sas.com/downloads/package.htm?pid=734>. The page content includes a "SUPPORT" sidebar with links like "Submit a Problem", "Update a Problem", "Check Problem Status", "License Assistance", "Manage My Software Account", and "Downloads & Hot Fixes". The main content area is titled "Downloads" and "SAS Migration Utility" with the version identifier "(93.500 14w47 - 18Nov2014)". A note states: "Please refer to the Run Migration Utility Using a Properties File document before downloading the SAS Migration Utility and accompanying properties template." Below this is a table of download options:

SAS Migration Utility					
Platform	Description	Request Download	Size	Release Date	ReadME
64-bit enabled Windows	SAS Migration Utility for 64-bit Win	smu93_x64.exe	179.0 MB	2014-11	pdf txt
All Platforms	Migration utility properties template for SAS 9.3	smu.properties.template	5 KB	2014-11	readme
UNIX	SAS Migration Utility for UNIX	smu93	210.5 MB	2014-11	pdf txt
Windows	SAS Migration Utility for Windows	smu93_32.exe	178.9 MB	2014-11	pdf txt
z/OS	SAS Migration Utility for z/OS	smu93.zos	210.0 MB	2014-11	pdf txt

For questions you may have about this download, please [contact our Product Support Group](#)

At the bottom of the page, there are links for "Contact Us", "Sitemap", "RSS Feeds", "www.sas.com", "Terms of Use & Legal Information", and "Privacy Statement". The copyright notice is "Copyright © 2015 SAS Institute Inc. All Rights Reserved."

Display 1: SAS Migration Utility for 64-bit Windows

If you run this application, the as soon as the download completes you immediately get an error that looks like the error in [Display 2](#).

```

C:\>C:\SAS_Software_Depot_target\utilities\smu93\smu93_x64.exe

Administrator: C:\Users\sretest\AppData\Local\Temp\2\sassmu3\launchsmu_wx6.exe
Installed jreexe is C:\Program Files (x86)\Java\jre6\bin\java.exe
11:00:01,248 [INFO ] SMU SAS Migration Utility version 9.3-3.584
The migration package output directory is required.

The SAS Migration Utility should always be run via command-line interface. It is
strongly recommended that the -properties option be used in lieu of individual
options. For more information, review the usage details below.
usage: SAS Migration Utility version 9.3-3.584
-analyze          Execute only the analysis, with no actual
                  data or configuration movement.
-davtier          Specifies that the DAU content should be
                  migrated on this tier.
-help            Print this message.
-localhost <host> Fully qualified DNS name of the local host
                  SAS Migration Utility is being executed
                  on.
-metadatabasehost <metadatabasehost> Metadata Server Host name.
-metadatabaseport <metadatabaseport> Metadata Server port.
-outputdir <directory> Migration package output directory.
-password <password> Metadata Server Administrator password.
-profile <profile> Metadata profile name containing host and
                  user information (no path or extension).
-properties <file> The path to a properties file containing
                  all necessary arguments for execution.
-replace         If specified, any existing data in the
                  migration package will be deleted and
                  replaced with the result of this run.
-sasconfigdir <sasconfigdir> SAS System configuration directory path.
-sasexecdir <directory> SAS executable directory.
-sasproductdir <directory> SAS products install directory.
-tier <name> The deployment tier to migrate in this
              operation. The name will be used to name
              the package subdirectory.
-user <user> Metadata Server Administrator user name.

Unexpected return value 1 from "C:\Program Files (x86)\Java\jre6\bin\java.exe"
-Xmx1024m -Djava.system.class.loader=com.sas.app.AppClassLoader -Dsas.app.class.
path="C:\Users\sretest\AppData\Local\Temp\2\sassmu3";"C:\Users\sretest\AppData\L
ocal\Temp\2\sassmu3\setup.jar" -Dsas.ext.config="C:\Users\sretest\AppData\Local\
Temp\2\sassmu3\sas.java.ext.config" -Dsas.app.launch.picklist="C:\Users\sretest\
AppData\Local\Temp\2\sassmu3\picklist" -Dsas.app.repository.path="C:\Users\srete
st\AppData\Local\Temp\2\sassmu3\eclipse" -Duser.dir="C:\Users\sretest\AppData\L
ocal\Temp\2\sassmu3" -cp "C:\Users\sretest\AppData\Local\Temp\2\sassmu3\eclipse\p
lugins\sas.launcher.jar" com.sas.apps.migration.smu.Main
C:\>

```

Display 2: Error Message from SAS Migration Utility on Windows Environment

This error occurs because the SAS Migration Utility does not have a graphical user interface. The utility is designed to be run on a variety of systems, and some of these systems are not configured for interactive applications. Therefore, the SAS Migration Utility must read all of the data it requires either from the command line or from a properties file. I advise that you use a properties file. It is much more convenient because you will have to run the SAS Migration Utility on all machines in your deployment, and you might need to run it twice on each - once in Analyze mode and once in Package Creation mode. Each run of the SAS Migration Utility requires that the same types of property values be provided, so you might as well enter them once in a file rather than many times on the command line.

You can see in [Display 1](#) that a template for the required response file is provided. You should download the template and insert the proper values for your deployment.

After you download the template and fill in the correct property values for your deployment, it should look something like this (In this example, the helpful comments describing each property in the template have been removed,):

```
SMU.config.dir=C:\\SAS\\Config\\Lev1
SMU.SASHOME=C:\\Program Files\\SASHome
SMU.host.metadata=my.metadataahost.com
SMU.user=sasadm@saspw
SMU.password={sas002}ENCODEDPASSWORD==
SMU.Output.Dir=C:\\SMU\\migrationPackage
SMU.webinfpltfm.dbms.userid=myDatabaseUserID
SMU.webinfpltfm.dbms.password={sas002}ENCODEDPASSWORD
SMU.cleartext.password.is_allowed=FALSE
```

It is important to note a few things about the properties file:

- Special characters need to be prefixed by a “\” character. For an exhaustive list of which characters need to be escaped see:
<http://docs.oracle.com/javase/6/docs/api/java/util/Properties.html>
- The “\” (backslash), “=” (equal sign), and “ ” (space) characters need to be prefixed by a “\” character, which results in Windows paths looking peculiar because each directory is separated by double \ characters.
- Passwords should always be encoded. If you do not encode the password, the SAS Migration Utility displays an error that provides the correctly encoded value for the password. This encoded value can then be copied and pasted into the properties file (thus overcoming the error). Alternatively, you can set the following property to allow the use of clear-text passwords, but SAS strongly recommends the use of encrypted passwords in files.

- `SMU.cleartext.password.is_allowed=TRUE`

RUNNING THE SAS MIGRATION UTILITY – GENERATING THE ANALYSIS REPORT

Now that you have successfully downloaded the SAS Migration Utility and you have your `smu.properties` file correctly formatted, you are ready to run the SMU in Analyze mode. Well, almost ready. Before you run the SAS Migration Utility, you should consult the trusty “[SAS® 9.4 Intelligence Platform Migration Guide](#)”. You will find introductory information and indispensable information about designing your migration.

In the “Performing Pre-Migration Tasks” chapter of “Create Migration Package” section, you will find information about how to run the SAS Migration Utility. This section of the manual describes some very important tasks that must be performed in order to correctly generate the SMU package and create an analysis report. Some of the SAS servers need to be running (for example, the SAS® Metadata Server, the Shared Services Database, and the SAS® Content Server) and other SAS processes must be shut down.

This section also includes a command line reference and some important notes regarding the SAS Migration Utility command. There are also myriad examples of the actual command line syntax. For the sake of illustration, I will provide a very simple example here:

```
smu94_x64.exe -properties smu.properties -analyze -replace
```

This particular command will not create a SMU package but will create an analysis report. I recommend running this step initially because it might identify errors and will run more quickly because it does not incur the time necessary to write out the package directory. Because the SAS Migration Utility command

requires the installation of a Java Runtime Environment, there might be a bit of a lag before the command responds, but once it does, it will immediately begin to write logging information to the console.

You must run the SAS Migration Utility using the same user ID that was used to deploy the SAS source system. Only this ID will have permissions to all the file system artifacts that the utility needs to inspect.

RUNNING THE SAS MIGRATION UTILITY – GENERATING THE MIGRATION PACKAGE

The migration package created by the SAS Migration Utility is a directory tree, and each machine in the deployment will add a new subdirectory to the package. It is wise to create the SMU package on file system that can be shared across all the machines that are a part of the SAS deployment. Otherwise, the package will have to be copied to each of the machines, and you will need to be very careful to protect the structure of the package and the ownership and permissions of its files.

On SAS multiple-machine deployments, run the SAS Migration Utility first on the machine hosting the SAS Metadata Server. You can run the SMU on the remaining tiers in any order. Do not run the SAS Migration Utility on machines that contain only SAS client software.

In deployments with a clustered metadata server or a clustered middle tier, run the SAS Migration Utility only on the first node in the cluster. If you want the target deployment to also use clustering, you will perform the necessary steps when you run the SAS Deployment Wizard on the target system.

To verify that the analysis successfully completed, open the migration utility log file found in the directory:

```
C:\smu.package\mymachine.sas.com\migrate.log
```

Scroll to the very end of the log. If you see output like the following, then the migration utility finished executing the report:

```
10:52:55,719 [INFO ] SMU Product analyses completed: 61 10:52:55,720
[INFO ] SMU No packaging was performed due to the mode setting.
```

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

SAS Migration Utility messages are in Java log4j format. These messages be a bit tricky to read for the unaccustomed, but once you get the knack, it quickly becomes apparent where the problem lies. Some common error messages include:

```
10:53:29,782 [INFO ] SMU SAS Migration Utility version 9.3-3.584
The properties d:\smu.properties does not exist.
```

This error message simply means that the properties file location that you specified on the command line does not exist.

Another common message is:

```
19:23:22,713 [ERROR ] SMU The migration utility had an error:
19:23:22,714 [ERROR ] SMU The output directory already exists. Use
replace to overwrite it.
19:23:22,714 [ERROR ] ERRLOG The migration utility exited with error:
com.sas.apps.migration.smu.FrameworkException: The output directory
already exists. Use replace to overwrite it.
    at
com.sas.apps.migration.smu.Framework.manageTierDirectory(Framework.java
:847)
    at
com.sas.apps.migration.smu.Framework.manageOutputDirectory(Framework.ja
va:769)
    at com.sas.apps.migration.smu.Main.init(Main.java:112)
```

```
at com.sas.apps.migration.smu.Main.main(Main.java:57)
```

As you might have surmised, this error message means that the output directory specified on the command line already exists. You should never delete the directory unless you are running the SAS Migration Utility on the very first machine in your deployment (the machine with SAS Metadata Server) as there will be information pertaining to the other machines that would be lost. Specify the `-replace` option on the SMU command line when you are updating an existing SMU package. This option will not delete existing data from the other machines.

The last in my top 3 list of most popular SAS Migration Utility errors is as follows:

```
09:22:07,066 [INFO ] SMU SAS Migration Utility version 9.4-4.42
09:22:08,047 [ERROR ] SMU The application could not log on to the
server "somemachine.sas.com:8561". The machine name is not valid.
09:22:08,048 [ERROR ] SMU The migration utility had an error:
09:22:08,049 [ERROR ] SMU The metadata server is down, or could not be
contacted with the provided information.
Check the host, port, user and password provided and the server state.
09:22:08,050 [ERROR ] ERRLOG The migration utility exited with error:
com.sas.apps.migration.smu.FrameworkException: The metadata server is
down, or could not be contacted with the provided information.
Check the host, port, user and password provided and the server state.
at
com.sas.apps.migration.smu.MetadataUtils.testServer(MetadataUtils.java:
156)
at
com.sas.apps.migration.smu.Main.setFrameworkProperties(Main.java:208)
at com.sas.apps.migration.smu.Main.init(Main.java:110)
at com.sas.apps.migration.smu.Main.main(Main.java:57)
Unexpected return value 6 from "C:\Program
Files\SASHome\SASPrivateJavaRuntimeEnvironment\9.4\jre\bin\java.exe" -
[...]
com.sas.apps.migration.smu.Main -properties smu.properties -analyze -
replace -outputdir c:/users/sasasf/Downloads/smu/smu.package
```

As is evident from this small sample, errors messages that are written by the SAS Migration Utility via the default log4j logger can be quite helpful, but the errors themselves can appear to be camouflaged among other less useful text.

Most of us expect to see the most important error message on the last line in a log file, so these SAS Migration Utility logs can be a bit misleading at first. But careful reading of the few lines above the bottom usually reveals the problem. In general, when looking for the root cause of failure, you should look for a line that is above the traceback at the very bottom of the log. A text search for the string "ERROR" can also be quite useful.

A copy of all the logging information is written to a file named `migrate.log` in the corresponding machine's subdirectory in the SMU migration package. You should inspect the end of this file and should see logging information like what is displayed in **Display 3**.

Note that there are messages in the log that contain words such as "Error" or "Warning" (highlighted in yellow). These messages can be ignored. You should solely focus your attention on the messages

Errors encountered during analysis and Errors encountered during packaging. If these statements display 0 errors as in **Display 3**, then your SAS Migration Utility analysis completed successfully.

In the following example, the SAS Migration Utility was run in Execute mode rather than Analyze mode. Therefore, a SMU package is created. As stated earlier, if you use the `-analyze` command option when running the SMU, then the packaging is not executed, and you will see only Errors encountered during analysis messages.

If you do not use the `-analyze` option when running the SAS Migration Utility, then both analyze and packaging stages are executed, and both sets of messages will be displayed. Regardless of how you run the SMU (with or without the `-analyze` option), the analysis stage is always executed.

```
C:\>C:\SAS_Software_Depot_target\utilities\smu93\smu93_x64.exe -properties C:\SMU\smu.properties -replace
C:\>
Administrator: C:\Users\srestest\AppData\Local\Temp\2\sassmu3\launchsmu_wx6.exe
html
11:17:36,361 [INFO] 1 SMU <TransformAnalysis.Transform.xslt> Loading stylesheet
t C:\SMU\migrationPackage\RDCEsx16154.race.sas.com\AnalysisReport\PrintableReport
t.xsl
11:17:36,369 [INFO] 1 SMU <TransformAnalysis.Transform.xslt> : Warning! Running
g an XSLT 1.0 stylesheet with an XSLT 2.0 processor
11:17:36,375 [INFO] 1 SMU <TransformAnalysis.Transform.xslt> : Warning! Runni
g an XSLT 1.0 stylesheet with an XSLT 2.0 processor
11:17:36,382 [INFO] 1 SMU <TransformAnalysis.Transform.xslt> : Warning! Runni
g an XSLT 1.0 stylesheet with an XSLT 2.0 processor
11:17:36,389 [INFO] 1 SMU <TransformAnalysis.Transform.xslt> : Warning! Runni
g an XSLT 1.0 stylesheet with an XSLT 2.0 processor
11:17:36,396 [INFO] 1 SMU <TransformAnalysis.Transform.xslt> : Warning! Runni
g an XSLT 1.0 stylesheet with an XSLT 2.0 processor
11:17:36,404 [INFO] 1 SMU Product analyses completed: 217
11:17:36,405 [INFO] 1 SMU Errors encountered during analysis: 0
11:17:36,405 [INFO] 1 SMU Product packaging completed: 55
11:17:36,405 [INFO] 1 SMU Errors encountered during packaging: 0
11:17:36,405 [INFO] 1 SMU Execution has completed. Please review the analysis r
eport at C:\SMU\migrationPackage\RDCEsx16154.race.sas.com\AnalysisReport\matrix-r
eport.html for more information.
C:\>
```

Display 3: Your Analysis Has Completed Successfully

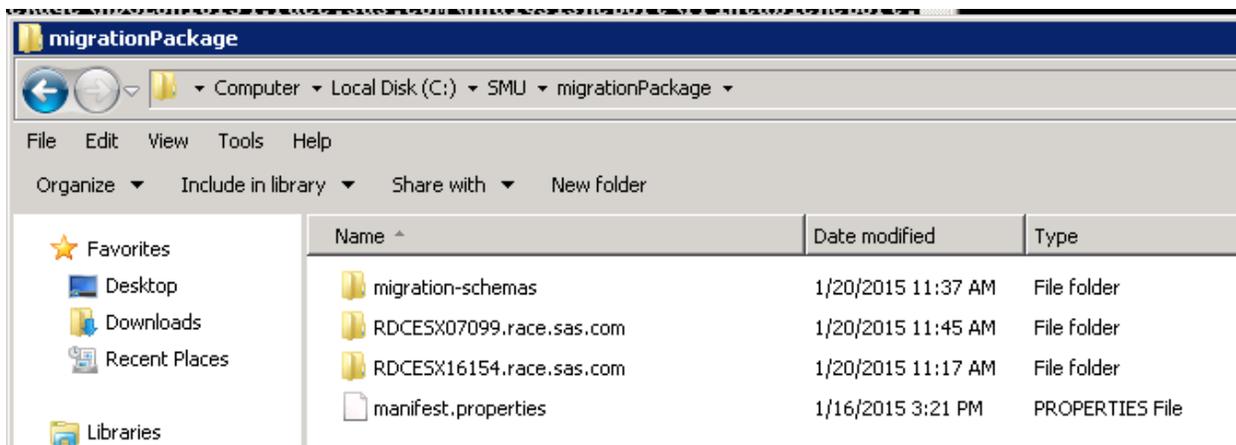
WORKING WITH YOUR SAS MIGRATION UTILITY PACKAGE

OVERVIEW

To review: you use the SAS Migration Utility to gather the data and configuration settings associated with a SAS deployment into a package.

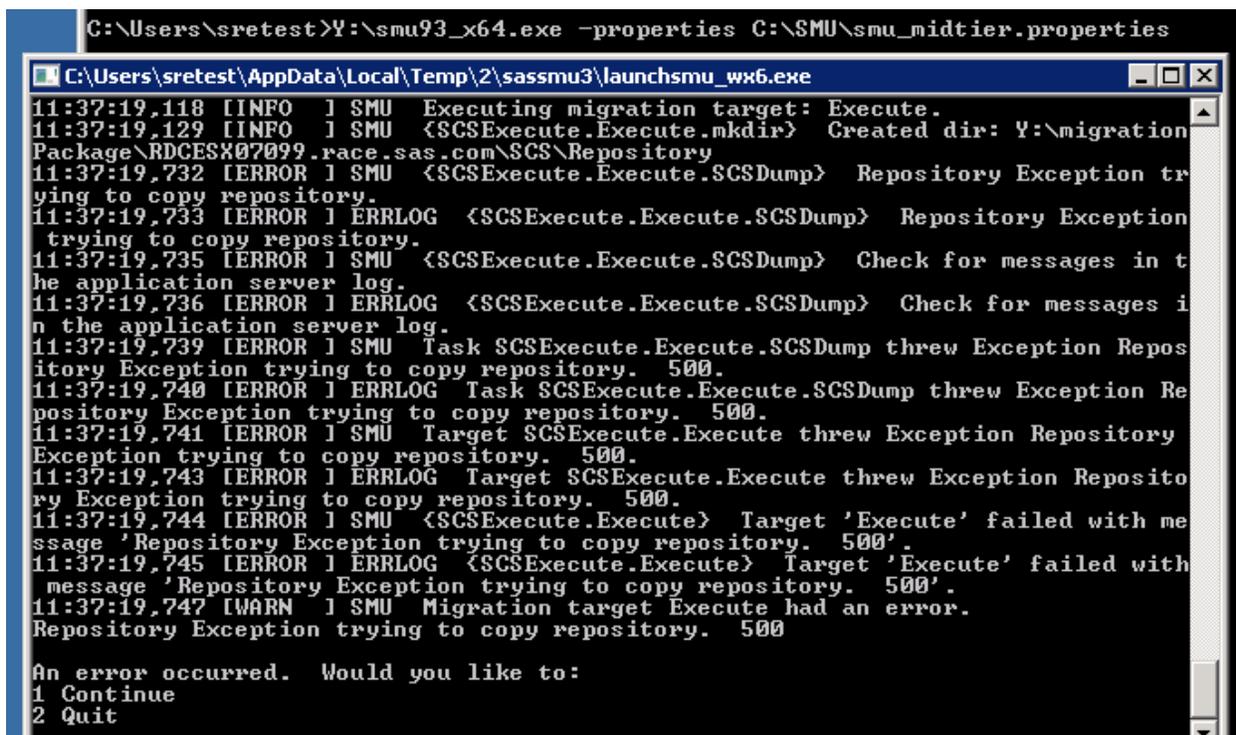
Since SAS deployments can and often do span several machines, the format of the package is simply an organized directory tree of files and subdirectories. We refer to this tree of directories as the “SMU package” and it is referenced by the location of the topmost directory, but it’s important to remember that the package itself is simply a tree of directories and subdirectories rather than a single package file.

As you can see in **Screen Display 4**, there are some top most directories that contain general information and then one subdirectory for each machine that is part of the SAS deployment. You will start by running the SAS Migration Utility on the machine that houses the SAS Metadata Server and this will create the topmost Migration Package directory and the first machine subdirectory. You must then copy or mount/share this SMU package onto the other machines in your deployment and re-run the SAS Migration Utility on each of these subsequent machines. When you do, the SAS Migration Utility will create a new subdirectory for each machine on which it is run. These subdirectories contain the information for all the SAS products on the corresponding machines.



Display 4

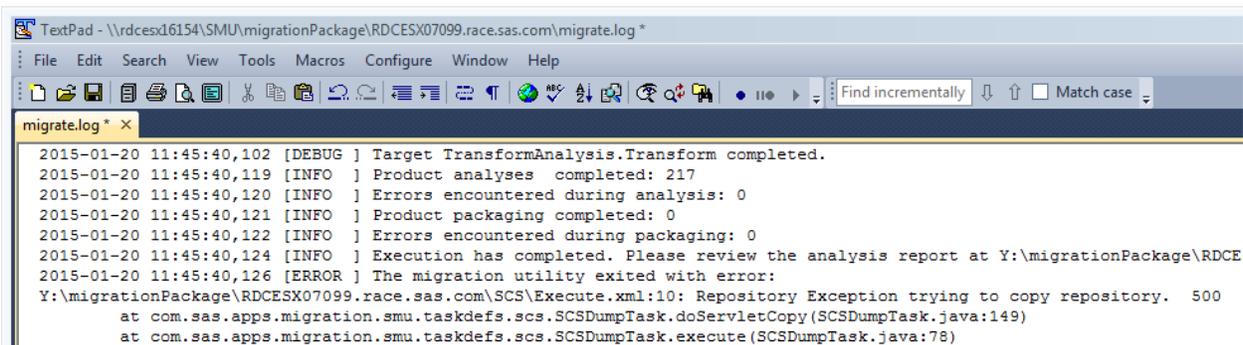
Consult the [SAS® 9.4 Intelligence Platform Migration Guide](#) to determine which servers must be running and which ones must be stopped when running the SAS Migration Utility. The SAS Content Server is especially finicky. Sometimes it must be running and sometimes it does not have to be running. It depends on operating system and file system permissions for the SAS installer ID. Take my advice. Save yourself some trouble. Read the guide. Have to get this right or you will see “Repository Exception” messages in the logs. This will force you to spend time in purgatory living with regrets (See [Display 5](#)). You have been warned.



Display 5

If you are on Windows, see “Packaging SAS Content Server on Windows” in “[SAS® 9.4 Intelligence Platform Migration Guide](#)” in the “Completing the Pre-Migration Checklist” section.

In the migrate.log, the repository error looks as follows:



```
TextPad - \\rdcesx16154\SMU\migrationPackage\RDCEsx07099.race.sas.com\migrate.log *
File Edit Search View Tools Macros Configure Window Help
migrate.log * x
2015-01-20 11:45:40,102 [DEBUG ] Target TransformAnalysis.Transform completed.
2015-01-20 11:45:40,119 [INFO ] Product analyses completed: 217
2015-01-20 11:45:40,120 [INFO ] Errors encountered during analysis: 0
2015-01-20 11:45:40,121 [INFO ] Product packaging completed: 0
2015-01-20 11:45:40,122 [INFO ] Errors encountered during packaging: 0
2015-01-20 11:45:40,124 [INFO ] Execution has completed. Please review the analysis report at Y:\migrationPackage\RDCE
2015-01-20 11:45:40,126 [ERROR ] The migration utility exited with error:
Y:\migrationPackage\RDCEsx07099.race.sas.com\SCS\Execute.xml:10: Repository Exception trying to copy repository. 500
at com.sas.apps.migration.smu.taskdefs.scs.SCSDumpTask.doServletCopy(SCSDumpTask.java:149)
at com.sas.apps.migration.smu.taskdefs.scs.SCSDumpTask.execute(SCSDumpTask.java:78)
```

Display

VIEW AND INTERPRET YOUR MIGRATION ANALYSIS REPORT

The SAS Migration Utility writes the analysis report to a file named FullReport.html in the AnalysisReport subdirectory under the machine subdirectory of the output directory that you specified when you ran the utility. Each machine in your deployment on which the SAS Migration Utility was run will have a FullReport.html analysis report, and each report will need to be examined.

To view your migration analysis report, open the following file:

```
C:\smu.package\mymachine.sas.com\AnalysisReport\FullReport.html
```

in a web browser. Using the report, answer these questions:

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

Starting with the first maintenance version for SAS 9.4, the analysis report offers both version analysis and packaging validation. In the 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. Packaging validation serves to ensure that each of the products deployed on the current source system machine have either been or can be properly packaged into the SAS Migration Utility.

If there are any problems with the package, they will be evident at this point. Two typical errors are indicative of specific problems.

First consider when the version of a product on your source system is too old to be compatible with the target system. In this case it may be necessary to upgrade the product on your source system before it can be successfully added to the SMU package. The error in [Display](#) illustrates this problem.

SAS Migration Utility

Version 9.4-4.42

Migration Analysis for RDCESX13120.race.sas.com

Wed Mar 11 14:54:15 EDT 2015

Status	Action
✓	No action required
●	An issue was detected. Review the Details for this item. Manual steps may be required for migration.
✗	A problem was encountered. Review the Details for this item. Remediation steps or repackaging may be required.

See <http://support.sas.com/migration/utilitynotes> for more migration information.

Migration Version Analysis

The migration version analysis of this machine detected potential issues with the following product versions. If you intend to migrate to one of the product versions listed in the "Versions Not Supported" column, then migration is not supported for any of the machines in your environment. This restriction is true even if migration version analysis on other machines did not detect unsupported versions. Please contact your SAS representative for assistance.

Note: The SAS Deployment Wizard will prevent unsupported migrations listed in the table below.

Otherwise, review the remaining product sections of this Migration Analysis report to determine if there are other migration issues that must be considered. If you are unsure of the version of the software to which you are migrating, review your Order Summary, available in your SAS Software Depot at <depot location>/install_doc/<order number>/ordersummary.html.

	Product Name	Version Configured (Source)	Versions Not Supported (Target)
✗	SAS Visual Process Orchestration	2.2	2.2

See <http://support.sas.com/migration/utilitynotes> for more migration information.

Product: SAS Content Server

Status	Item name	Classification	Item type	Version	System location	Package location	Details
✓	SAS Content Server	Product		9.4	C:\SAS\Config\Lev1\AppData\SASContentServer\Repository		Migration is supported for this version.

Display 7

A red "X" in the analysis report indicates that the flagged product cannot be successfully migrated to the target system. In this case you will need to review the documentation associated with the product to discover which version of the product would be compatible to the target system, and then update the source system version to the correct version.

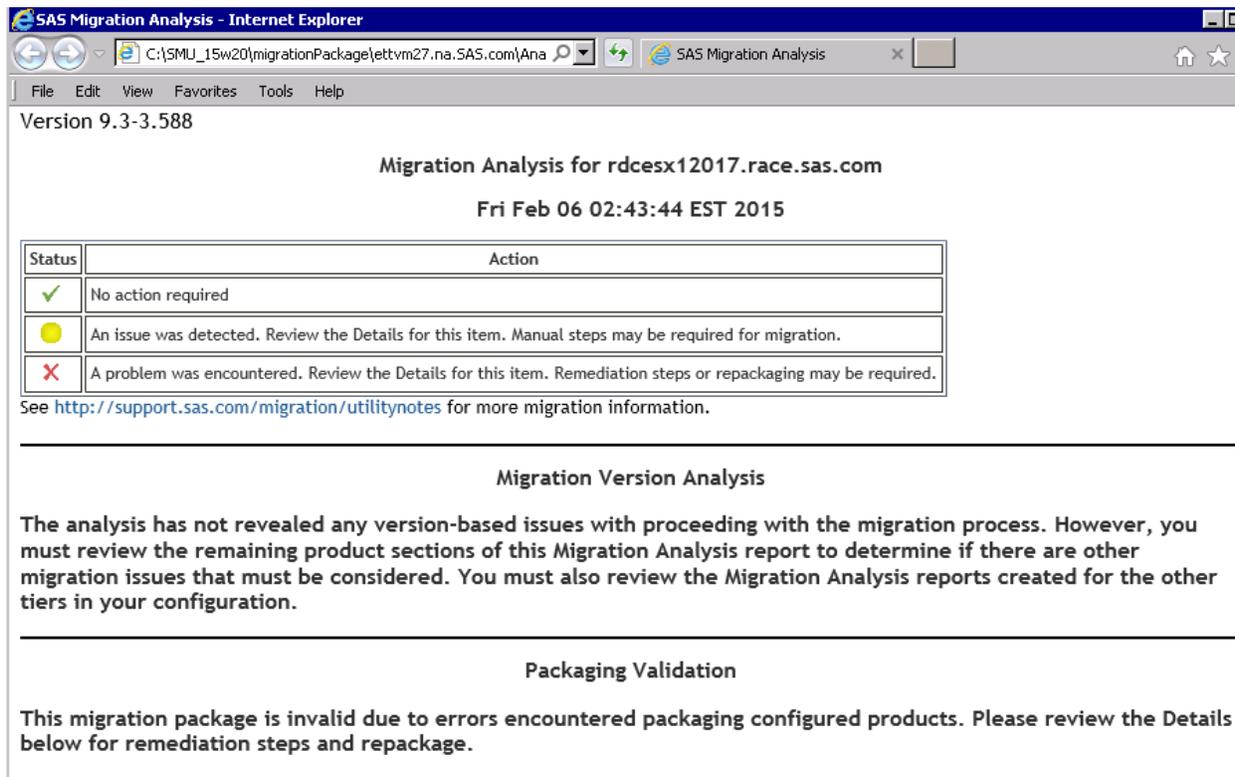
CREATING THE ACTUAL SMU PACKAGE WITH CONTENT

Once you are ready to create a SMU package with content, the steps are the same as running in analyze mode but without the `-analyze` option on the command line. At this point you must ensure that you use the version of the migration utility that is shipped with your actual SAS 9.4 target system order. This is because new product updates that become available after you place your order might include support for migration. Running the SAS Migration Utility that accompanies the order that was actually delivered to you is required as this ensures an accurate version analysis in your analysis report. A SAS Migration Utility version you downloaded earlier could easily be out of date.

At this point you repeat the same steps as you performed in analyze mode. You should work very methodically. Follow the recipe outlined in "[SAS@ 9.4 Intelligence Platform Migration Guide](#)" cookbook step by step as this will guide you through the successful creation of a SMU package.

You will again need to review the newly generated logs and analysis reports on each machine. You should no longer see any Migration Version Analysis errors.

It is possible that even though the product versions are compatible, an error occurs during packaging of a product. In this case, the analysis report will note the error in the Packaging Validation summary as shown in **Display 8**.



Version 9.3-3.588

Migration Analysis for rdcesx12017.race.sas.com
Fri Feb 06 02:43:44 EST 2015

Status	Action
✓	No action required
●	An issue was detected. Review the Details for this item. Manual steps may be required for migration.
✗	A problem was encountered. Review the Details for this item. Remediation steps or repackaging may be required.

See <http://support.sas.com/migration/utilitynotes> for more migration information.

Migration Version Analysis

The analysis has not revealed any version-based issues with proceeding with the migration process. However, you must review the remaining product sections of this Migration Analysis report to determine if there are other migration issues that must be considered. You must also review the Migration Analysis reports created for the other tiers in your configuration.

Packaging Validation

This migration package is invalid due to errors encountered packaging configured products. Please review the Details below for remediation steps and repackaging.

Display 8

When you see this error in the Packaging Validation summary, it is necessary to scroll down to the actual product section and inspect the error message. It will appear as shown in **Screen Display 9**.

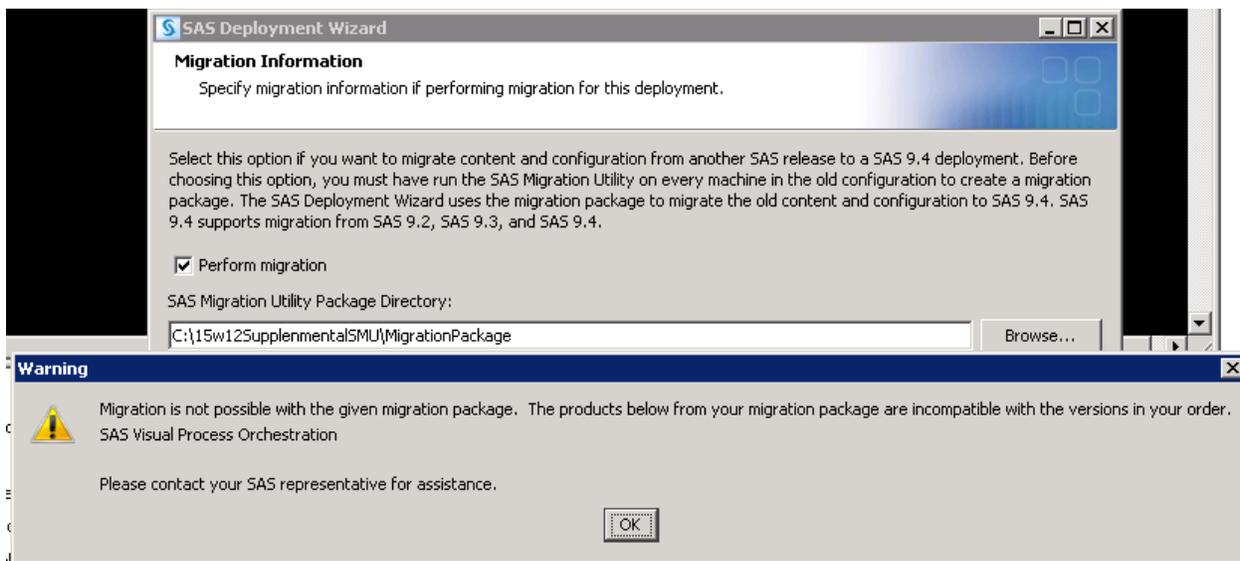
Product: SAS Staging Utility Server Tier

Status	Item name	Classification	Item type	Version	System location	Package location	Details
✗	SAS Staging Utility Server Tier	Product				n/a	Migration of this SAS environment is not recommended. This version of the SAS Migration Utility does not support migration for SAS Staging Utility Server Tier. See http://support.sas.com/migration/utilitynotes for more information.

Display 9

Once you have resolved the noted problems and are able to create a SMU package with no errors on any of the machines, then you are ready to deploy the SMU package to the target machine.

There is no value in proceeding to the next machine until you have successfully packaged the contents of the current machine. If there are any errors in the SMU package, it is not valid and the SDW will reject it when you attempt to use it on the target system, as seen in **Screen Display 10**.



Display 10

UNPACKING THE MOVING TRUCK AT THE NEW PLACE: SAS DEPLOYMENT WIZARD

As you have seen, the SAS Migration Utility contains an analysis report for every machine in your current SAS deployment. You use these reports 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. This plan is required to install SAS 9.4 and will guide the SAS Deployment Wizard as it performs the SAS 9.4 deployment. The target system plan file must be perfectly aligned with the source system topology.

Once you have an error free SMU package and a matching plan file for your target system, you can then proceed with migrating the package to your target system. Care must be taken to choose the machine in the SMU package that corresponds to each machine on the target system.

CONCLUSION

Executing a successful migration from a SAS source system (typically an older version) to the latest and greatest release of SAS does take some planning and preparation. But if one pays careful attention to the instructions in the SAS Migration Guide, the process can be straightforward and the benefits of having all the latest technology that SAS has to offer make it a very rewarding proposition.

RECOMMENDED READING

- [SAS® 9.4 Intelligence Platform Migration Guide](#)

CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the author at:

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