

## 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 stability 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. Migration 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 software or features.

When 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, more well-appointed sub-division. The concepts are very similar.

- You load all the contents of your old house, garage, garden shed, and perhaps even a pool house (if you have a large SAS deployment) into well-organized boxes.
- You neatly pack these boxes into a moving truck.
- The moving truck takes all the boxes to the new house.
- After the moving truck arrives, you unpack the contents into the appropriate place 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. This paper identifies 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. All customers should familiarize themselves with the [SAS® 9.4 Intelligence Platform Migration Guide](#) before beginning a migration.

Customers should follow along in the book as they perform the migration. This book provides indispensable help with very specific details, which are beyond the scope of this paper. The book is available at the following URLs:

<http://support.sas.com/documentation/cdl/en/bimig/63853/HTML/default/viewer.htm> and

<http://support.sas.com/documentation/cdl/en/bimig/63853/PDF/default/bimig.pdf>.

### UNDERSTANDING THE GROUND RULES

Before you 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 migrate a subset of the products 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 when metadata servers and 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 cluster or web application server cluster.)
- No changes are allowed to architectural topology. Your SAS products must 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

### BACKUP THE SOURCE SYSTEM

As is the case with most people who have been involved with computers for more than a short amount of time, I believe that the value of system backups cannot be overstated. At SAS, we test our software extensively, and quality is our highest priority. However, as with any system that 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 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 I do.

For specific instructions about how to do backups, see the “Preparing Your Metadata Repositories” topic in Chapter 2 of [SAS® 9.4 Intelligence Platform Migration Guide](#).

### CLEAN UP UNNECESSARY ARTIFACTS

As with any move, it makes no sense to move things that you will not 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.

Because 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 become quite large. Now is an excellent time to look at the `/Log` directories under your configuration directory and remove the old ones. It's not uncommon to see hundreds of megabytes of log files in a long running SAS deployment. If you do not delete these files, they will be copied into your migration package and this will translate into many minutes spent drumming fingers on desks as these megabytes are copied.

## 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. As the SAS Migration Utility is analyzing each machine, it generates a migration analysis report. Using this report, you can determine which SAS products on your current SAS system 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 SAS Migration Utility package. As this paper later stresses in order to create 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/> and select **Downloads & Hot Fixes**. In the SAS System Software category, click **SAS Migration Utility**. From the Download page for the SAS Migration Utility, select the version number and operating system that matches your source system. If your source system is a SAS 9.3 system on 64-bit Microsoft Windows, you would choose that version in the table. (See Figure 1.)

**SAS Downloads: SAS Migration Utility - Windows Internet Explorer**

http://support.sas.com/downloads/package.htm?pid=734

Configuration Guidelines and De... SAS Downloads: SAS Migrati... x

File Edit View Favorites Tools Help

**SUPPORT**

- Submit a Problem
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- Downloads & Hot Fixes
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  - JMP Software
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  - Third Party Software
  - Additional Products
  - Hot Fixes

**All Downloads >> SAS Migration Utility**

**Downloads**

**SAS Migration Utility**

(93.500 14w47 - 18Nov2014)

This version of the SAS Migration Utility is provided for users who have not yet received their 9.4 software, and are interested in assessing the scope of migration for their installed 9.3 products. When you are ready to proceed with your migration, use the SAS Migration Utility that is included in your order to perform your analysis, assess requirements, and create the migration package. If you use a SAS Migration Utility other than the version included in your order, it might support a different set of products and components than your order, and the migration package could produce inaccurate results. See the [SAS Intelligence Platform: 9.2 to 9.3 Migration Guide](#) for information on locating and using the SAS Migration Utility.

**Note:** Please refer to the [Run Migration Utility Using a Properties File](#) document before downloading the SAS Migration Utility and accompanying properties template.

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

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**Figure 1: Download Page for the SAS Migration Utility for SAS 9.3**

If you run the SAS Migration Utility as soon as the download completes, you immediately get the error shown in Figure 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 DAV 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.
-metadatahost <metadatahost> Metadata Server Host name.
-metadataport <metadataport> 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.
-sasexedir <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\Lo
cal\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:\>
```

Figure 2: Error Generated When You Download and Immediately Run the SAS Migration Utility

This error occurs because the SAS Migration Utility does not have the data it needs to proceed. Since the SAS Migration Utility does not have a graphical user interface it cannot prompt for the information it requires. This means that if the required information is missing or incorrect, errors like the one in Figure 2 will result.

The SAS Migration Utility is designed to run on a variety of systems, and some of these systems are not configured for interactive applications. So the SAS Migration Utility must read all of the data it requires either from the command line or from a text file that contains this data. The file containing the data must be in Java properties file format so it is referred to as a properties file.

You should use a properties file rather than the command line to provide data to the SAS Migration Utility because it is much more convenient. You will have to run the SAS Migration Utility on all machines in your deployment and you will likely need to run the SAS Migration Utility twice on each machine. Each run of the SAS Migration Utility requires that you provide practically the same property values. Having to

reenter all the data on a command line would become quite tiresome unless you particularly enjoy typing. The first run of the SAS Migration Utility is in Analyze mode, and the second run is in Package Creation mode.

Figure 1 shows that a template for the required properties file is provided at the same web site that you used to download the SAS Migration Utility. You should download the properties file template and edit it to insert the proper values for your particular SAS deployment.

After you download the template and fill in the correct property values for your deployment, it should look 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 leads to the peculiar look of Windows paths where each directories are separated by double “\” characters.
- Passwords should always be encoded. If you do not encode your passwords, the SAS Migration Utility displays an error that shows the correctly encoded value for the password. You can copy and paste this encoded value into the file, and thus overcome 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.

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

## **RUNNING THE SAS MIGRATION UTILITY TO GENERATE 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 SAS Migration Utility in Analyze mode. Well, almost ready. Before you run the SAS Migration Utility, you should consult Appendix 1 of the trusty [SAS 9.4 Intelligence Platform: Migration Guide](#).

The “Create a Migration Analysis Report” section of this manual describes some very important tasks that must be performed in order to correctly generate the migration 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.

Appendix 1 of the manual 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, here is a very simple example:

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

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

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

Because the migration package that is created from running the SAS Migration Utility is a directory tree and each machine in the deployment adds a new subdirectory to the package, it is wise to create the SAS Migration Utility package in a directory that can be shared across all the machines that are a part of the SAS deployment. Otherwise, the package must be copied to each machine. When copying the package, you must be very careful to protect the structure of the package and the ownership and permissions of the files.

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

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

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

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

Scroll to the very end of the log. If you see output similar to 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 similar to these, then the migration utility was unable to complete. A common cause can be a lack of available disk space.

SAS Migration Utility messages are in Java log4j format. This format can be a bit tricky to read, but once you get acclimated, it quickly becomes apparent where the problem lies. Here is a common error message:

```
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 location that you specified for the properties file location does not exist.

Here is another common message:

```
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)

```

This error message means that the SAS Migration Utility output directory already exists. You should never delete the directory unless you are running the SAS Migration Utility on the very first machine (the machine with the SAS Metadata Server) in your deployment as there will be information pertaining to the other machines that would be lost. Specify the `-replace` option on the SAS Migration Utility command line when you are updating an existing SAS Migration Utility package.

Here is the last error in my top 3 list of most popular SAS Migration Utility errors:

```

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 they can sometimes appear to be camouflaged among other less useful text.

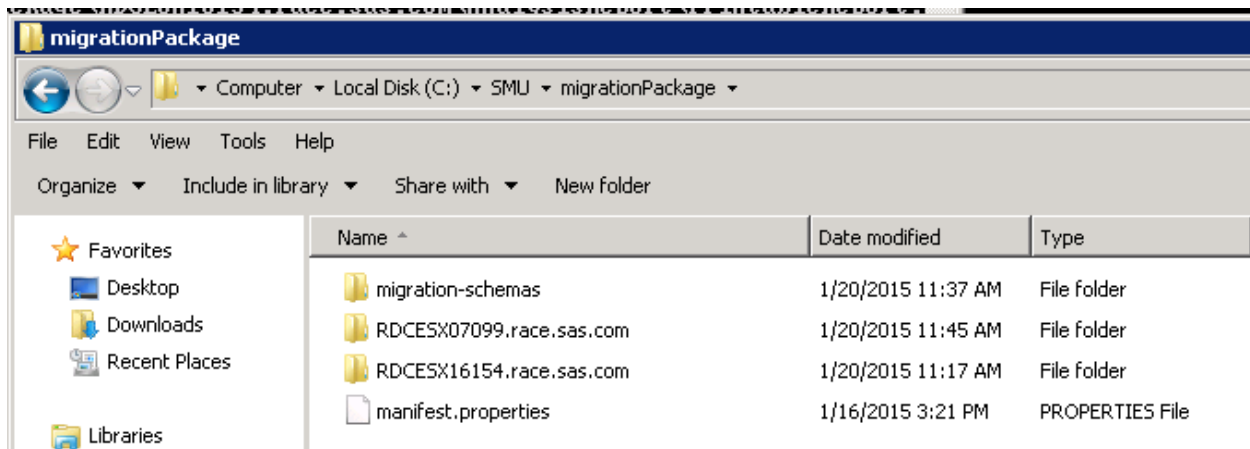
A copy of all the logging information is written to a file named `migrate.log` in the corresponding machine's subdirectory in the SAS Migration Utility migration package. You should inspect the end of this file and should see logging information like what is displayed in Figure 3.

Also, note for this example, the SAS Migration Utility was run in Execute mode to create the migration package, which is why there is messaging for both the analysis and packaging stages. If you use the `-analyze` command option when running the SAS Migration Utility, the packaging stage is not executed, and you see only the “Errors encountered during analysis:” messages because no package content is created. If you do not use the `-analyze` command option when running the SAS Migration Utility, both the analysis and packaging stages are executed, and both sets of messages are displayed. Regardless of how you run the SAS Migration Utility (with or without the packaging), the analysis stage is always executed.

[illegible]



As you can see in Figure 4, the topmost directories contain high-level information, and there is one subdirectory for each machine that is part of the SAS deployment. You start by running the SAS Migration Utility on the machine that hosts the SAS Metadata Server which will create the topmost SAS Migration Utility Package directory and the first machine subdirectory. You must copy or mount this SAS Migration Utility package onto the other machines in your deployment and re-run the SAS Migration Utility on each of these machines. When you do, the SAS Migration Utility creates a new subdirectory for each new machine on which it is run. These subdirectories contain the information for all the SAS products on the represented machines.



**Figure 4: Example of a Migration Package**

Read *SAS 9.4 Intelligence Platform: Migration Guide* to determine which servers must be running and which servers cannot be running. The SAS Content Server is especially finicky. Sometimes it has to 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. Read the guide. You must get this right, or you will see “Repository Exception” messages and you will live to regret it. (See Figure 5.)

```

C:\Users\sretest>Y:\smu93_x64.exe -properties C:\SMU\smu_midtier.properties

C:\Users\sretest\AppData\Local\Temp\2\sassmu3\launchsmu_wx6.exe
11:37:19.118 [INFO ] SMU Executing migration target: Execute.
11:37:19.129 [INFO ] SMU {SCSExecute.Execute.mkdir} Created dir: Y:\migration
Package\RDCEX07099.race.sas.com\SCS\Repository
11:37:19.732 [ERROR ] SMU {SCSExecute.Execute.SCSDump} Repository Exception tr
ying to copy repository.
11:37:19.733 [ERROR ] ERRLOG {SCSExecute.Execute.SCSDump} Repository Exception
trying to copy repository.
11:37:19.735 [ERROR ] SMU {SCSExecute.Execute.SCSDump} Check for messages in t
he application server log.
11:37:19.736 [ERROR ] ERRLOG {SCSExecute.Execute.SCSDump} Check for messages i
n the application server log.
11:37:19.739 [ERROR ] SMU Task SCSExecute.Execute.SCSDump threw Exception Repos
itory Exception trying to copy repository. 500.
11:37:19.740 [ERROR ] ERRLOG Task SCSExecute.Execute.SCSDump threw Exception Re
pository Exception trying to copy repository. 500.
11:37:19.741 [ERROR ] SMU Target SCSExecute.Execute threw Exception Repository
Exception trying to copy repository. 500.
11:37:19.743 [ERROR ] ERRLOG Target SCSExecute.Execute threw Exception Reposito
ry Exception trying to copy repository. 500.
11:37:19.744 [ERROR ] SMU {SCSExecute.Execute} Target 'Execute' failed with me
ssage 'Repository Exception trying to copy repository. 500'.
11:37:19.745 [ERROR ] ERRLOG {SCSExecute.Execute} Target 'Execute' failed with
message 'Repository Exception trying to copy repository. 500'.
11:37:19.747 [WARN ] SMU Migration target Execute had an error.
Repository Exception trying to copy repository. 500

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

```

Figure 5: Examples of Repository Exception Messages

If you are running in a Windows environment, see the “Packaging SAS Content Server on Windows” topic in [SAS 9.4 Intelligence Platform: Migration Guide](#).

Here is the repository error in the migrate.log file:

```

TextPad - \\rdcesx16154\SMU\migrationPackage\RDCEX07099.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\RDCEX07099.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)

```

Figure 6: A Repository Error in the migrate.log File

## VIEW AND INTERPRET YOUR MIGRATION ANALYSIS REPORT

The SAS Migration Utility writes the analysis report to a file named `FullReport.html`. This file is in the `AnalysisReport` subdirectory underneath the machine subdirectory of the output directory that you specified in the SAS Migration Utility properties file. Each machine in your deployment where you ran the SAS Migration Utility has a `FullReport.html` analysis report, and each report needs to be examined.

To view your migration analysis report, open the following file in a web browser:

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

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 in the first maintenance release 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 can be or have been properly packaged into the SAS Migration Utility.

If there are any problems with the package, these problems are 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 might be necessary to upgrade the product on your source system before it

can be successfully added to the SAS Migration Utility package. The error in [Figure 7](#) illustrates this problem.

SAS Migration Utility

Version 9.4-4.42

THE POWER TO KNOW.

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.

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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.

**Figure 7: Example of Product Version That Is Not Support on the Target System**

A red "X" in the analysis report indicates that the flagged product cannot be successfully migrated to the target system. Review the documentation associated with the particular 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 SAS MIGRATION UTILITY PACKAGE WITH CONTENT

When you are ready to create a SAS Migration Utility package with content, the steps are the same as running in Analyze mode but without the `-analyze` option on the command line. You must make sure 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.

At this point, you repeat the same steps that you performed in Analyze mode. You should work very methodically. Follow the [SAS 9.4 Intelligence Platform: Migration Guide](#) step by step as this will guide you through the successful creation of a SAS Migration Utility package.

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

However, it's possible that the product versions are compatible, but an error occurred during packaging of a particular product. In this case, the analysis report notes the error in the Packaging Validation summary as shown in Figure 8.

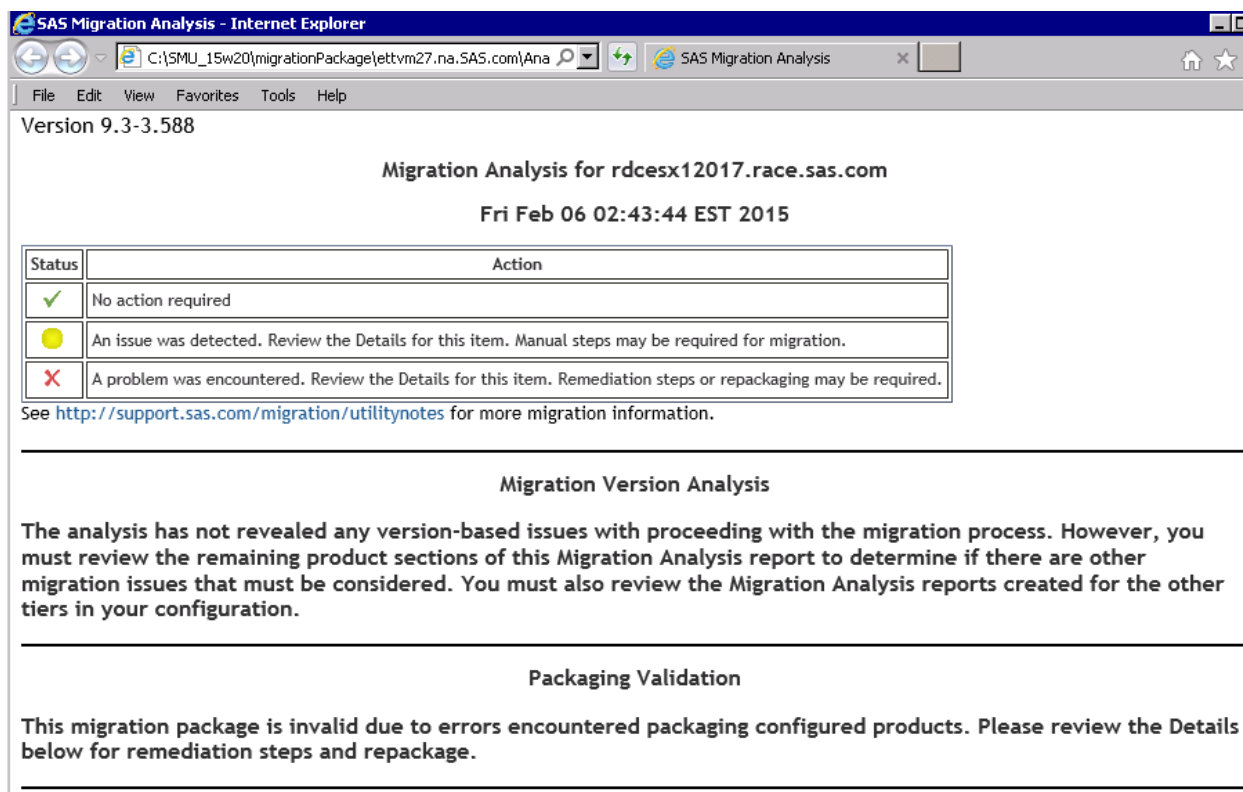


Figure 8: Error in the Packaging Validation Summary

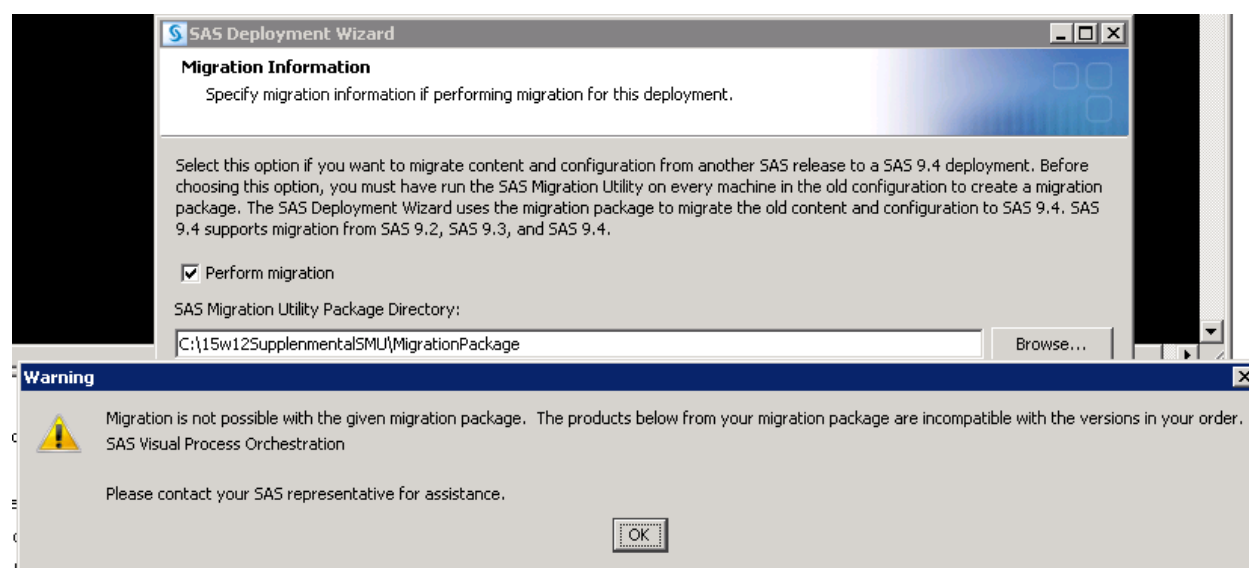
When you see this error in the Packaging Validation summary, it is necessary to scroll down to the actual product section (as shown in Figure 9) and inspect the error message.

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 <a href="http://support.sas.com/migration/utilitynotes">http://support.sas.com/migration/utilitynotes</a> for more information.

Figure 9: Example of Error in the Product Section

After you resolve the noted problems and are able to create a SAS Migration Utility package with no errors on any of the machines, you are ready to deploy the SAS Migration Utility migration 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 SAS Migration Utility package, it is not valid, and the SAS Deployment Wizard rejects it when you attempt to use it on the target system, as seen in Figure 10.



**Figure 10: Error Message from the SAS Deployment Wizard**

## 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 (which is required to install SAS 9.4). The plan file for the target system has to be perfectly aligned with the source system topology.

After you have an error free SAS Migration Utility package and a matching plan file for your target system, you can proceed with migrating the package to your target system. Care must be taken to choose the machine in the SAS Migration Utility 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 you pay careful attention to the instructions in the *SAS 9.4 Intelligence Platform: Migration Guide*, the process can be straightforward. The benefits of having all the latest technology that SAS has to offer make migration to the latest release a very rewarding proposition.

## RECOMMENDED READING

- [\*SAS 9.4 Intelligence Platform: Migration Guide\*](#)



## CONTACT INFORMATION

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