

Modernize Your Business Intelligence Content from SAS[®] 9 to SAS[®] Viya[®] in Three Steps

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ABSTRACT

In recent releases of SAS[®] Visual Analytics on SAS[®] Viya[®], many reporting and dashboarding capabilities have been introduced that make the move to the current version of SAS Visual Analytics very attractive. Because the underlying architecture has changed, you must carefully prepare for this move. This paper describes how you can best prepare and execute the modernization and what you should take into consideration to avoid any setbacks. The presentation also includes a live demonstration showcasing how to move content from SAS Visual Analytics 7.4 to SAS Visual Analytics 8.

INTRODUCTION

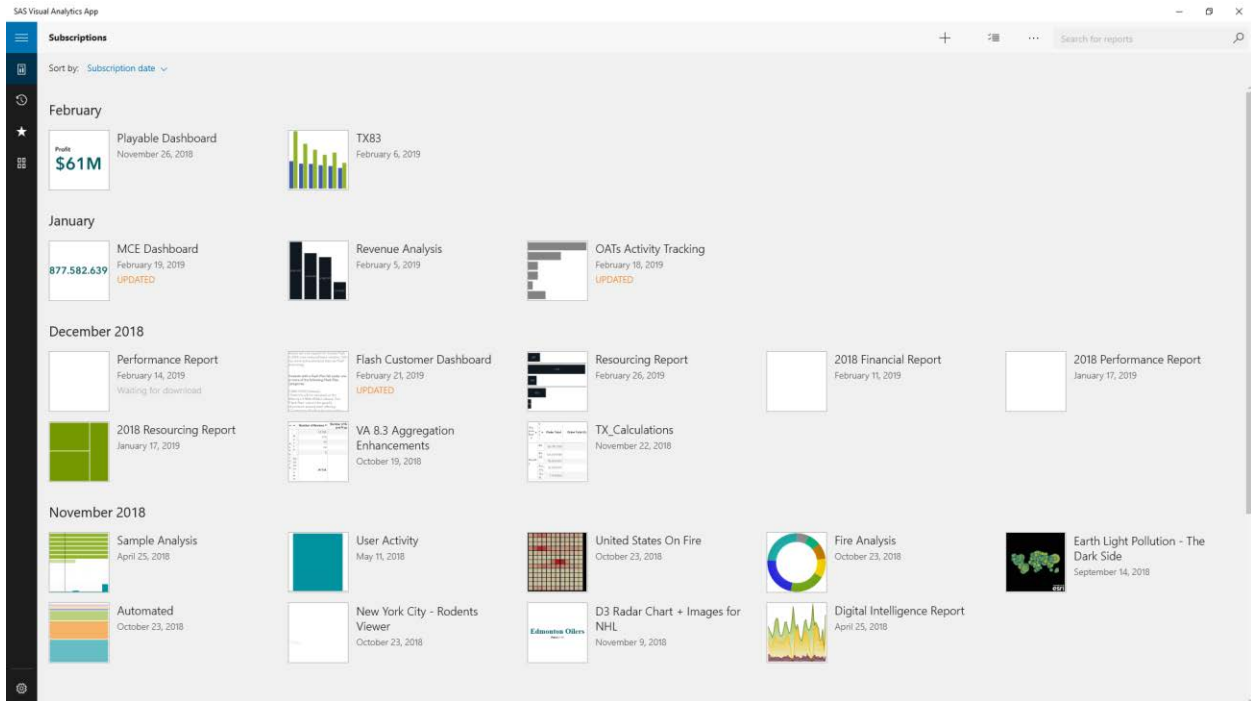
The third release of SAS[®] Visual Analytics on SAS[®] Viya[®] is currently available. While new customers are already enjoying the benefits of the newest release, there are a significant amount of environments still running SAS Visual Analytics 7.x on SAS 9[®]. If you are an administrator of a SAS Visual Analytics 7 environment, you might have already asked yourself the question of what it would take to move the content to the latest release. In the following sections I want to outline how you can best prepare for the promotion process, learn about objects taking part in promotion, and additional things that need to be done to get your SAS Visual Analytics reports up and running in the target environment.

PRELIMINARY CONSIDERATIONS

It is inevitably necessary that you check the prerequisites for SAS Visual Analytics on SAS Viya before you start planning your promotion process. In general, hardware requirements and supported operating systems are the same, so you should be able to run SAS Visual Analytics on SAS Viya on the same box that the existing version is already deployed. You should also think about running SAS Visual Analytics 7 and SAS Visual Analytics 8 for some time side by side. This allows you to move users from the old system to the new system gradually as different user groups might also have different requirements. There is also a technical aspect that has to be considered carefully. In SAS Visual Analytics 7 on SAS 9.4 there was a choice for information consumers to either use the Flash or the HTML5 version of the Viewer. You might already be well aware of Adobe ending the support for Flash by 2020. This means that at some point in the near future your users will have to make the move to the HTML5 version anyway. Running SAS Visual Analytics in the HTML5 version requires a browser that is supported, which means that your users will not be able to use Microsoft Internet Explorer 11. In any case, you should provide a 64bit version of a supported browser (for example, Google Chrome, Firefox, Edge, or Safari) as application performance is better. This performance gain comes with a cost as the 64bit browser versions do need more memory to run smoothly. You should not plan to run these browsers on desktops that only have 4GB of RAM. From my personal experience 6GB of RAM is the absolute minimum but I would recommend at least 8GB.

If your clients do not have 8GB of RAM available but are already running on Windows 10, you can consider installing the SAS[®] Visual Analytics App (Display 1) on these machines. The memory consumption of this app is significantly smaller compared to a 64bit browser. Another advantage is the performance of the app itself as all the necessary HTML5 components are already installed and do not need to be downloaded. I strongly recommend

considering this option if it is applicable. It is worth noting that you can use the app for viewing SAS Visual Analytics 7 reports too.

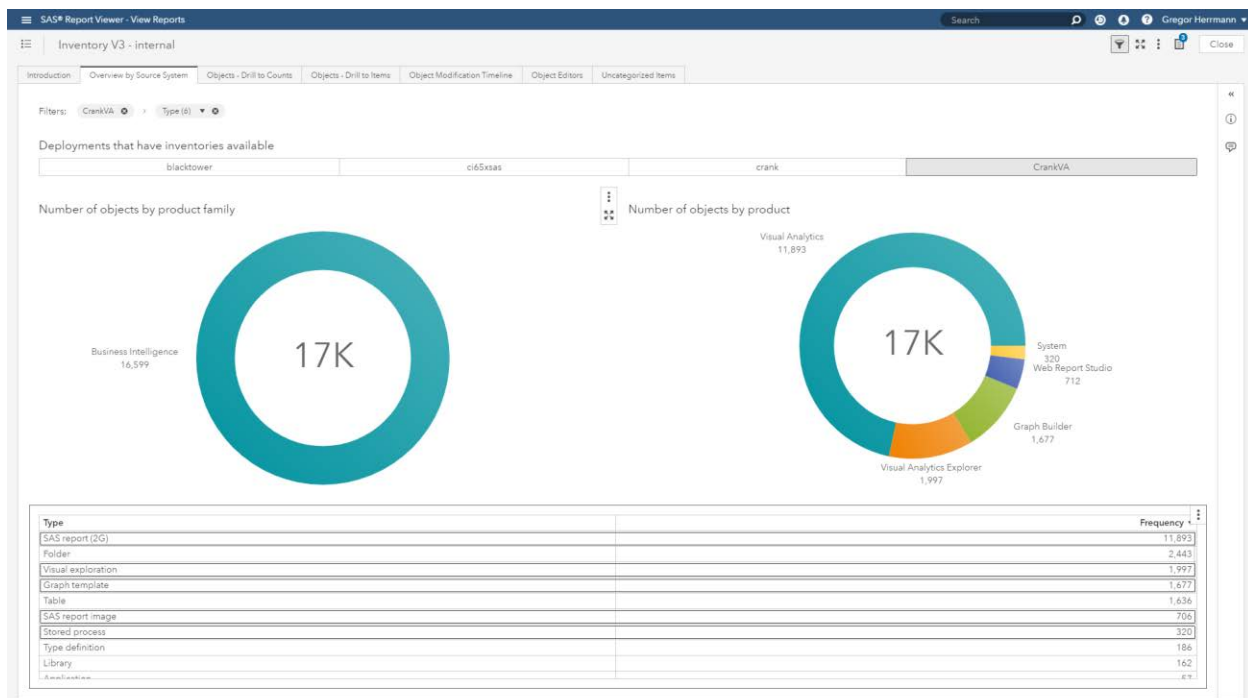


Display 1. SAS® Visual Analytics App

STEP 1: KNOW WHAT YOU HAVE IN STOCK

The first step is to get an overview of what content is included in your current environment. With the intention of making this task less painful for administrators, R&D is currently developing an assessment tool to automate the process of creating an inventory for you. This tool is only available on Linux and mainly consists of a couple of scripts that must be run in your existing environment. The tool creates an inventory data mart that can be published to a SAS Visual Analytics 8 instance with predefined reports that can help you analyze your existing system (Display 2). There are multiple things that you can easily extract from these reports:

1. The content types that you have in your inventory. This is very important as not all content types are part of the promotion process.
2. The size of your inventory, meaning the number of reports and explorations that you have.
3. You will be able to compare different environments (for example, dev versus prod).



Display 2. Sample Page from Predefined Inventory Report

STEP 2: PRE-PROMOTION TASKS AND CONSIDERATIONS

OBJECTS THAT ARE NOT PROMOTED

Step 1 should have given you the answer to the following question: Do I have content that does not participate in the standard promotion process? The following content types belong to that category:

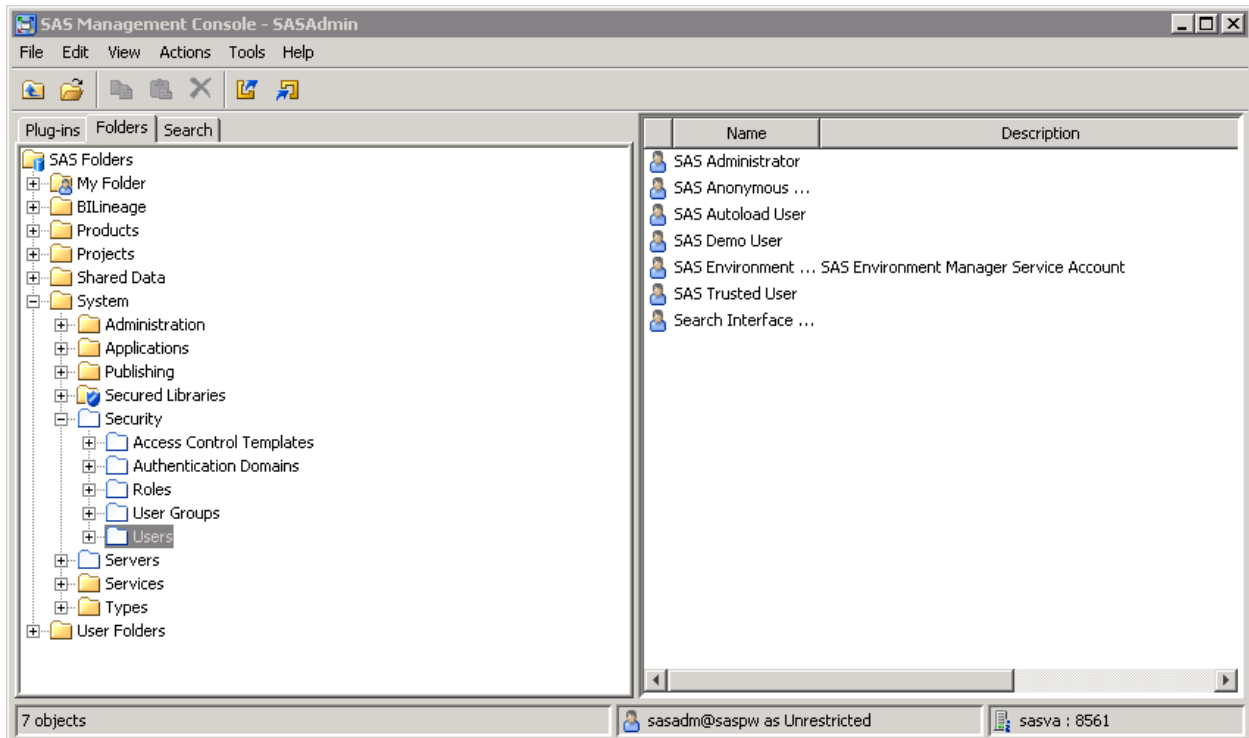
1. data
2. user-defined formats
3. SAS® Visual Data Builder jobs
4. comments
5. custom themes
6. SAS® Visual Statistics projects

Data must be loaded to the target system before you can start the promotion process. It is possible to create a path-based SAS® Cloud Analytic Services (CAS) library where you can copy your SAS data sets to. Keep in mind that it is no longer necessary to load tables into memory upfront before opening a report. User-defined formats must be imported in the target environment either via a new graphical user interface in SAS® Environment Manager or programmatically. In any case, the formats must be present before loading any table that uses a user-defined format into memory. There is currently no way to promote SAS Visual Data Builder jobs to SAS Viya. However, you might be able to save a SAS Visual Data Builder job as SAS code and reuse it in CAS. Comments cannot be promoted and you must re-create them if necessary. Due to the switch in technology from Flash to HTML5, custom themes cannot be reused in SAS Visual Analytics 8. You must re-create the custom theme with the new HTML5 Theme Designer and then reapply it to the report. If you have SAS Visual Statistics projects from SAS Visual Analytics 6.4 or SAS Visual Analytics 7.1 and want

to promote the content, you must upgrade to SAS Visual Analytics 7.2 or higher. That upgrade converts SAS Visual Statistics project objects to visual exploration objects.

AUTHORIZATION

One main goal of the promotion is to preserve authorization rules when moving from the existing system to the target system as this could save a lot of extra work. There is one obstacle to overcome to achieve this goal and this is the fact that CAS no longer stores user information internally like we did in the SAS® 9 Metadata Server. CAS authenticates against a directory server that pulls all the required user and group information from the server or from a cache that is refreshed frequently. We need to make sure that all of the required users and groups can be mapped correctly during the promotion process. Otherwise, the authorization settings cannot be applied. To get this done, we have to export all necessary identities and groups from the security folders in the SAS 9 Metadata Server into a package file (Display 3). This package file will then be used with the sas-admin command-line-interface to check the mappings of users and groups within the SAS Viya environment. Any user or group that cannot be mapped will be listed so that you can amend accordingly.



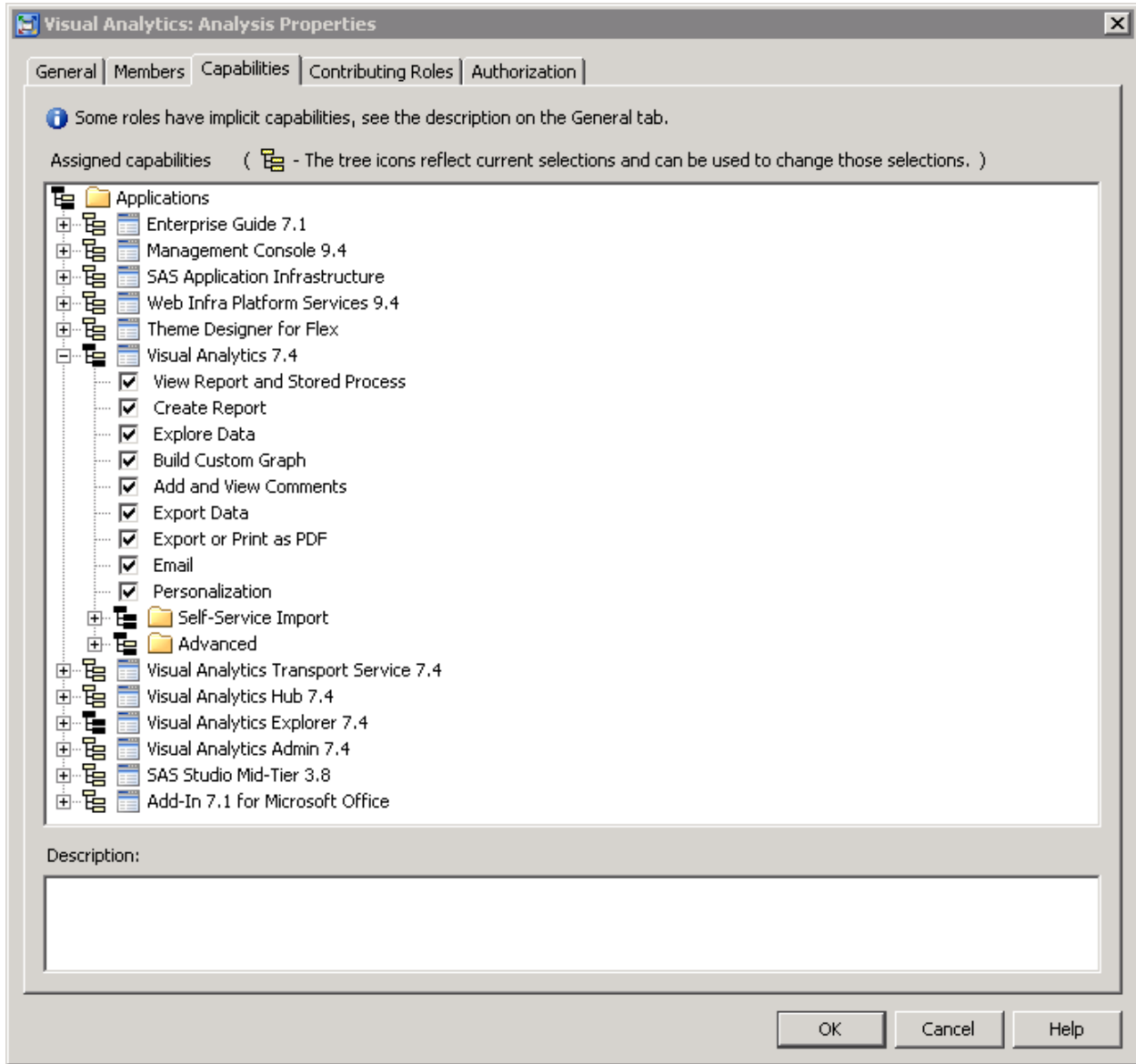
Display 3. Exporting Identities Package from SAS® Management Console

ROLES

The SAS 9 Metadata Server includes a concept to customize the functionality of applications for specific user groups: roles. There is no equivalent to the SAS 9 roles in SAS Viya. For example, if you want to be able to create your own reports in SAS Visual Analytics 7 you must be member of the Visual Analytics Analysis role (Display 4). In SAS Visual Analytics 8 every authenticated user can create reports in a standard deployment. What can be done in a SAS Visual Analytics 8 environment to restrict functionalities?

In SAS Viya an administrator can create custom groups. Groups and Users from your LDAP Directory Server can then be used to assign members to these custom groups. By applying

rules to these custom groups, you will then be able to restrict functionality in SAS Visual Analytics 8 for the assigned members of the custom group.



Display 4. Roles in SAS® 9 Metadata Server

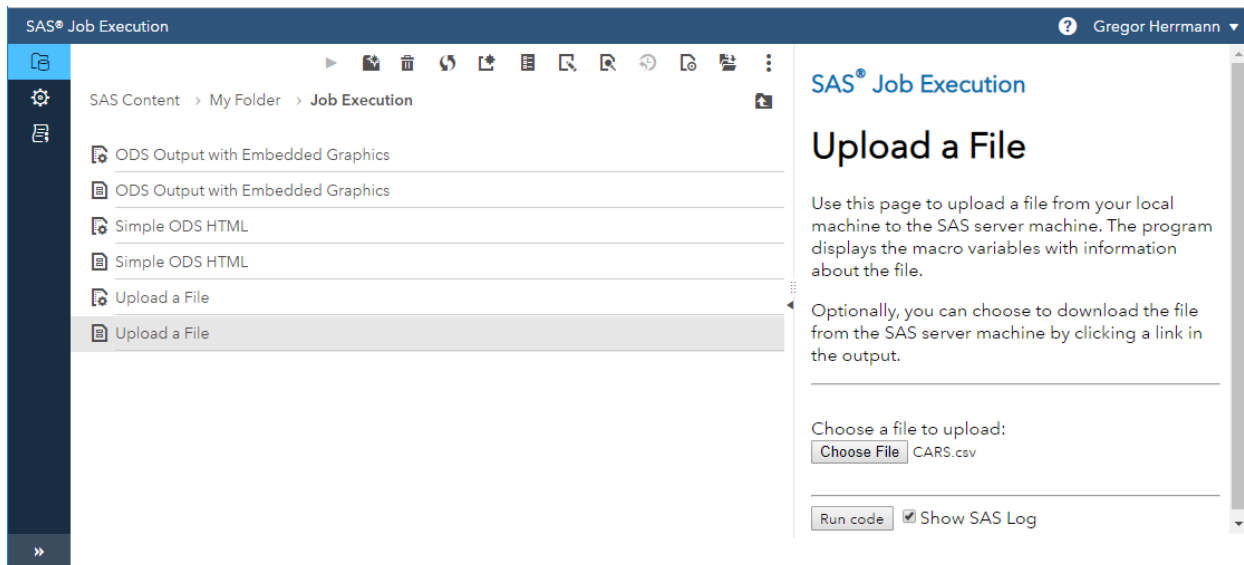
STORED PROCESSES

Stored Processes have been used widely in SAS 9 since its very specific functionality can be encapsulated and then used from a wide variety of interfaces. SAS Visual Analytics 7.x can also use Stored Processes as a part of a SAS Visual Analytics report. What happens if you are promoting a SAS Visual Analytics 7.x report to SAS Visual Analytics on SAS Viya? The promoted report with one or more Stored Processes will work correctly and Stored Processes will be executed as long as the SAS 9 environment is up and running. In a transition phase where you are running SAS Visual Analytics 7 and SAS Visual Analytics 8 in parallel everything should work fine. But what options do you have when SAS 9 is no longer running? This is heavily depending on what problem a Stored Process solves in SAS Visual

Analytics 7 that could not be addressed by standard SAS Visual Analytics capabilities. In general, there are three options:

1. Replace the Stored Process with a standard capability of SAS Visual Analytics on SAS Viya. Of course, this only applies if the current version of SAS Visual Analytics provides this.
2. Replace the Stored Process with a data-driven content object. With these objects you can insert specific graphs that are not supported out of the box in SAS Visual Analytics by using external Java graph libraries. The data-driven content can also be used to fulfill other requirements like a data-entry form or data writeback.
3. A successor for the Stored Process Framework in SAS 9 for SAS Viya is already on its way, it is called SAS® Job Execution (Display 5). The SAS Job Execution can already be used to replace Stored Processes when no prompts are being used.

Apart from the individual options available for replacing a Stored Process, you should have a good understanding of the usage pattern of Stored Processes in your existing SAS Visual Analytics reports. The percentage of reports that contain Stored Process objects is an indicator of how much additional manual work can be expected after the reports have been promoted. Running SAS Visual Analytics 7 and SAS Visual Analytics 8 in parallel for some time and keeping the reports with Stored Processes in the SAS Visual Analytics 7 environment might be a good option. It can be expected that future versions of SAS Visual Analytics 8 on SAS Viya will bring additional support for the promotion of Stored Processes.



Display 5. SAS® Job Execution Web Application with Samples

VISUAL EXPLORATIONS

Visual Explorations will no longer exist as a separate file format in SAS Visual Analytics 8 due to the efforts to consolidate interfaces. All objects that have been available in SAS® Visual Analytics Explorer are now available in SAS® Visual Analytics Designer on SAS Viya. When you promote a Visual Exploration from your existing environment, it will be automatically converted to a SAS Visual Analytics report in the target environment. Keep in mind that the new consolidated interface in SAS Visual Analytics 8 brings a couple of new capabilities that might allow you to enhance the promoted explorations. You can choose from a larger variety of objects and they can all interact with each other, so it is highly

likely that there is some potential to amend the promoted explorations to make them even more useful for the consumer.

AUTO-LOADING

Auto-loading of tables into the memory of SAS® LASR™ Analytic Server plays an important role in many of the existing SAS 9 environments. The reason for this is the fact that a report or exploration cannot be opened successfully unless the necessary tables have been loaded completely into memory. In most of the cases when tables are not available, report consumers had to contact the administrator of the environment to sort this out.

SAS Visual Analytics 8 on SAS Viya works differently in two ways:

1. Tables do not have to be loaded completely into memory prior to being used in a report. They are partially loaded into memory and the remaining part is memory-mapped. This allows a more effective use of available memory in the CAS Server.
2. If tables are not loaded at all but reside in a CAS library, they will be loaded upon request. If a consumer opens a report, the required tables will be loaded without further notice.

Knowing that and depending on your individual requirements, auto-loading might no longer be necessary at all. However, if you have additional requirements with regard to managing the loading and unloading of data, this can be achieved with the CAS Table State Management facility. By default, there are three sample jobs provided that you can access via the Jobs window in SAS Environment Manager (Display 6). These sample jobs serve as templates and you can copy and modify them by adjusting available parameters. Once finished, you can schedule them based on time triggers.

Name	Scheduled	Description	Date Created
Autoload to Public		Imports csv, sas7bdat, and ex...	December 13, 2018 10:08:16 ...
BINARY_BACKUP_SCHEDULE	🕒	This job is created by sas.depl...	October 2, 2018 02:59:17 PM
DEFAULT_BACKUP_SCHEDULE	🕒	This job is created by sas.depl...	October 2, 2018 02:59:13 PM
Sample: Import cas-shared-d...		Imports csv, sas7bdat, and ex...	October 2, 2018 03:06:00 PM
Sample: Load cas-shared-def...		Loads data in cas-shared-defa...	October 2, 2018 03:06:01 PM
Sample: Unload cas-shared-d...	🕒	Unloads infrequently accesse...	October 2, 2018 03:06:01 PM
Unload cas-shared-default De...	🕒	Unloads infrequently accesse...	March 1, 2019 03:08:09 PM

Display 6. Scheduling CAS Table State Management Jobs in SAS® Environment Manager

CUSTOM THEMES

As I have already mentioned before, Custom Themes will not participate in the promotion process. If you promote a report with a Custom Theme, a dummy copy of the default theme will be created and applied to the report. If you want to avoid that behavior, you have to re-create the custom theme with the same name in your target environment before running the promotion.

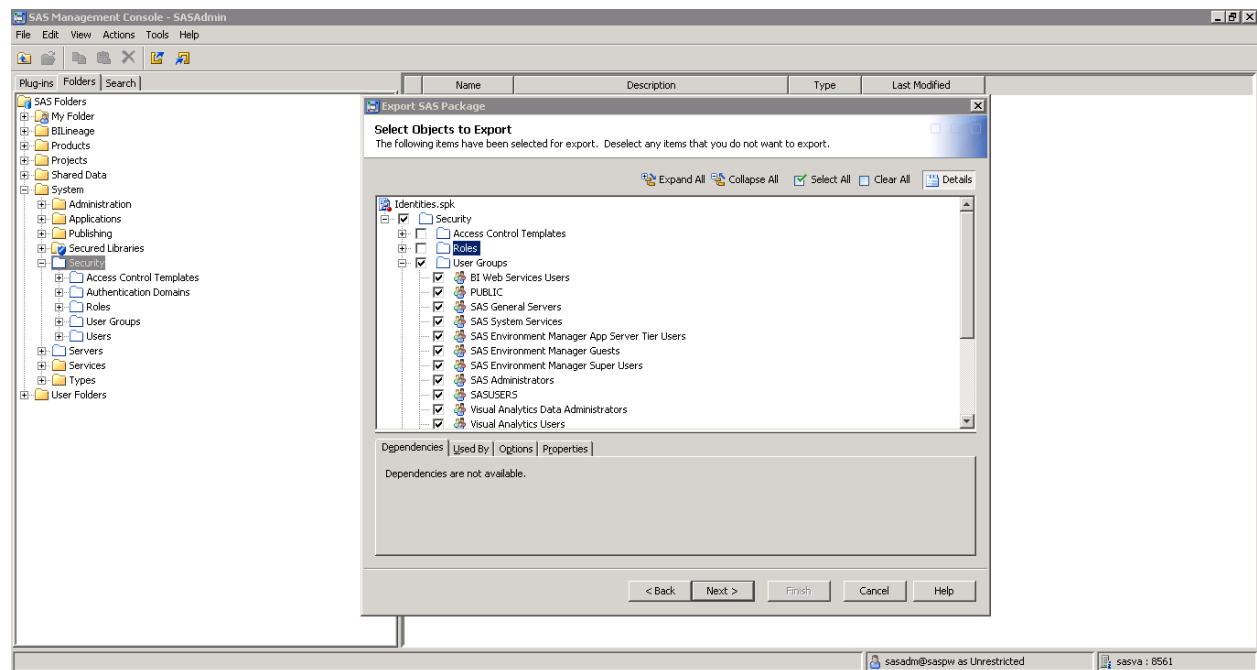
STEP 3: EXECUTE THE PROMOTION

CREATING THE EXPORT PACKAGES

The following items need to be exported for promotion:

1. Identities: This package must contain all the relevant user and group information.

The process of creating the export packages from SAS 9 is straight forward. In SAS® Management Console you can create this package by navigating to the System Folder and clicking on the export icon in the toolbar. Deselect Access Control Templates and Roles in the Export SAS Package window (Display 7). You can also deselect any groups or users that do not impact authorizations for your SAS Visual Analytics reports and explorations.



Display 7. Exporting Package in SAS® Management Console

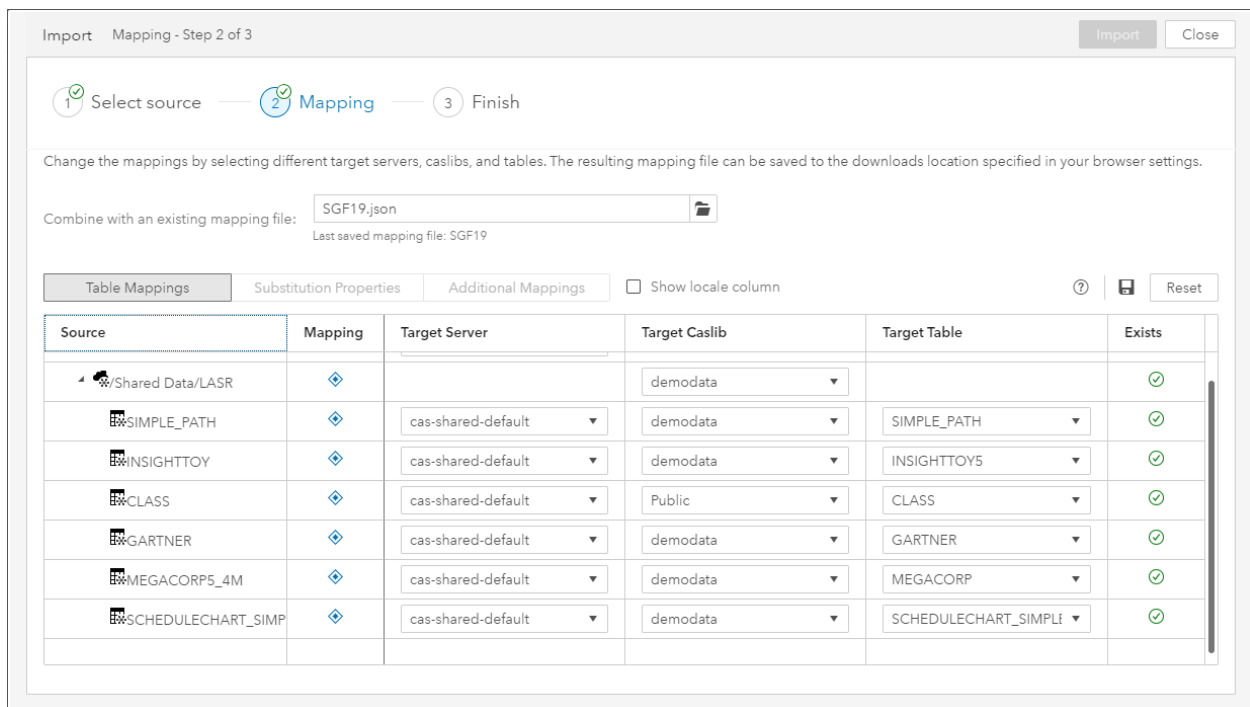
2. Export SAS LASR Analytic Server definitions, LASR libraries, Base libraries, and respective tables (optional). The export of these objects is optional. It is only needed if you want to access LASR tables directly from SAS Viya or if you want Base SAS libraries to be converted to path-based CAS libraries. If you intend to export these objects, I recommend exporting libraries and tables in separate packages and importing the libraries package first so that the tables can be mapped to the libraries in a subsequent step.
3. Export explorations and report definitions.

GENERATE MAPPING FILE

To generate the mapping file that is needed for the import of the content, you should make yourself familiar with the transfer Command-Line Interface (CLI). The purpose of this step is to create a file that contains the mapping information for users, servers, libraries, and data definitions. The default name for this mapping file is ContentMappings.json. It is recommended that you open the file in a text editor to check for correctness. If you have reports that contain Stored Processes, follow the instruction in the documentation to add the information for the storedProcessBaseUrl option.

PROMOTE CONTENT

The content promotion can now be done within the import window of SAS Environment Manager. The user running the promotion must be member of the SAS Administrators custom group in SAS Viya. After you have chosen the package file to import, the next step is to provide necessary server, library and table information for the target. Tables that have the same name in the target environment will automatically be mapped once the server and caslib information is provided. Display 8 shows the mapping window in SAS Environment Manager. After adjusting the mappings, you should only see green check boxes in the Exists column on the far right of the window. After finishing the import, there is an option to save the current mappings to a .json file. You can then use this JSON file while importing another package within SAS Environment Manager or when promoting content with the Command-Line Interface in batch.



Display 8. Importing Package in SAS® Environment Manager

It is worth mentioning the following restrictions:

1. The import process will re-create the original folder structure in SAS Viya. You will not be able to specify a different folder location during the import process even if your package does not contain any folder at all. However, you can move the content subsequently.
2. Currently you cannot select the objects to import, you always must import the complete package.

After concluding the promotion process, you should be able to open the reports and converted explorations successfully in SAS Visual Analytics 8. I nevertheless recommend testing every report thoroughly in the new environment especially when you have also promoted authorizations.

CONCLUSION

No question, the process for moving from SAS Visual Analytics 7 to SAS Visual Analytics 8 must be planned thoroughly. It is also vital to assess the requirements and usage patterns from consumers as this helps to decide which reports might benefit the most from the new capabilities and should be prioritized in the promotion process. Nevertheless, if you follow the guidelines outlined in this paper you will find that every minute you put into the preparation will pay off by avoiding unnecessary trouble. I strongly encourage you to consider the move from SAS Visual Analytics 7 to the current release on SAS Viya as the capability gap is significant and your consumers will appreciate it.

RECOMMENDED READING

- *SAS® Viya® 3.4 Administration: Promotion (Import and Export)*
- *SAS® Viya® 3.4 Administration: Using the Command-Line Interfaces*

CONTACT INFORMATION

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

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