SAS® 9.3 Administration Guilty Pleasures: A Few of My Favorite Things

Diane Hatcher, SAS Institute Inc., Cary, NC

ABSTRACT

Over the evolution of SAS® 9.3, SAS has continued to enhance and augment its administration capabilities. Most of these capabilities are well-known and welcome additions for SAS administrators, but there are some hidden jewels that you might not be aware of.

This paper reveals some "guilty pleasures," features that make the SAS environment easier to manage and more robust, including stored process reports, metadata-bound libraries, the authdomain option for LIBNAME, and special tricks with metadata folders.

INTRODUCTION

You probably never heard the words "SAS®9 Administration" and "guilty pleasures" in the same sentence before. "Guilty pleasures" are things that you just love to consume but society might raise their eyebrows, roll their eyes, and sigh in tolerance if they knew about these loves. Consumption typically refers to eating trashy food, watching trashy TV shows, or reading trashy novels. But, in this case, I do have these little "loves" in SAS® Management Console that allow me to do things—things that might seem off the beaten track because we might not talk about them very often. These are not trashy things at all, but I'm sure society still rolls their eyes at my admitted geekiness.

There are actually quite a number of things I could cover in this paper, but here are just a few of my favorite things that you might not have heard of before or might have seen in passing but didn't really pay too much attention to:

- stored process report
- metadata security tricks: metadata-bound libraries and authdomain
- metadata folders: virtual folders and search

If you haven't dug deep into these areas yet or run across them while trolling through our 1000s of pages of documentation, I'll explain why these are some of my guilty pleasures. I think you might raise your eyebrows as result, but in an "Oh really, that's pretty cool!" kind of way.

GUILTY PLEASURE #1: STORED PROCESS REPORT

A stored process report is a high-level metadata object that was introduced with SAS 9.3. It consists of stored process output that is cached, and that output can be viewed without re-executing the stored process. So, a stored process report is essentially a view of the output of the stored process. If a package exists and has not expired, the package is returned to the caller with no additional processing. If no package exists or if the package has expired, the stored process is executed to create an up-to-date result package. After the stored process has been executed, the new result package is returned to the client and any expired packages are deleted.

A stored process report generated by a stored process might need to change only on a daily, weekly, monthly, or quarterly basis. These stored process reports can now be generated easily without needless repetition of the stored process execution. See Figure 1 for more detail.
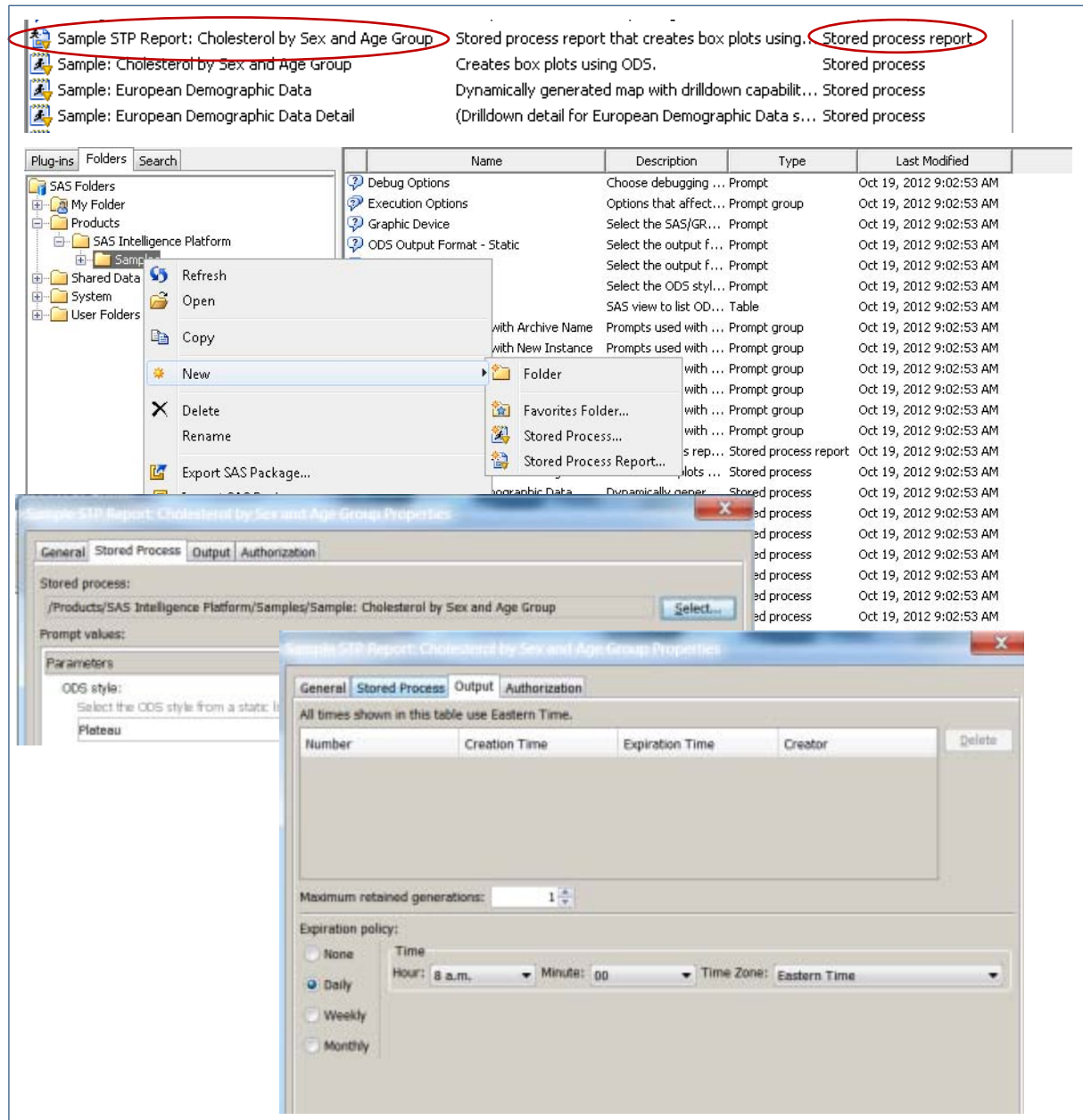
Figure 1. Stored Process Report Creation and Properties

WHY DOES IT MAKE ME FEEL GUILTY?

I just **love** this option; it would rank near or at the top of my guilty pleasures. I mean, what's not to love about making SAS® smarter about how to use resources and improve response times? Especially if the stored process might take some time to run, you can control how often the code actually needs to be executed. Coupled with PROC STP, which allows you to programmatically call a stored process, there are many places you could leverage this.

The reason I feel guilty about this is that the concept has not been totally embraced across the SAS platform in SAS 9.3. You can use the SAS Stored Process Web Application to display the output or use the SAS Package Viewer. But it's not yet supported by the SAS® Information Delivery Portal, for example. I would love to see something like this extend across the platform.

WHY SHOULD YOU CARE?

The potential for this architecture is still huge in my mind. When I first learned about it several years ago, I nearly jumped out of my chair! (You can ask R&D to verify that—they thought I was crazier than usual!) In spite of the limited support from existing SAS interfaces, there is enough support available to leverage via custom web applications or analytic process flows that call stored processes. I'm also thinking that the caching mechanism can be used to trigger all types of actions, even if visual output is not required. And, if more of you can leverage this technology, the more R&D can enhance it and extend its use.

GUILTY PLEASURE #2: METADATA SECURITY TRICKS

As you know, the SAS® Metadata Server provides an extra security layer in order to control access to content when using an application that relies on metadata. Using the folder structure, you have pretty fine-grained control over who can access what content. There are a number of papers covering metadata security in detail. (See References for a list.)

But, with SAS® Enterprise Guide® users, they are able to define their own LIBNAME statements, as long as they know the location of the physical data (and any credentials needed to connect). By doing that, they can bypass metadata security to access the data. Right? Wrong! You now have access to two cool features—metadata-bound libraries and the authdomain option in the LIBNAME statement.

METADATA-BOUND LIBRARIES

First, let's talk about metadata-bound libraries. This is a new feature in SAS® 9.3M2, which was released in December 2012. A metadata-bound library is a physical Base SAS® library that is tied to a corresponding metadata object. Each physical table (SAS data set) within a metadata-bound library has information in its header that points to a specific metadata object (a secured table object). The pointer creates a security binding between the physical table and the metadata object. The binding ensures that SAS universally enforces metadata-layer permission requirements for the physical table—regardless of how a user requests access from SAS. This means that metadata security on tables in a metadata-bound library will always be enforced—even if using Base SAS or SAS Enterprise Guide to access it. The standard rules apply:

- The requesting user can connect to the metadata server in which the corresponding object is stored.
- The requesting user's metadata identity has all required metadata-layer effective permissions for the requested action.
- The host identity with which the data is retrieved has all required host-layer access to the data.
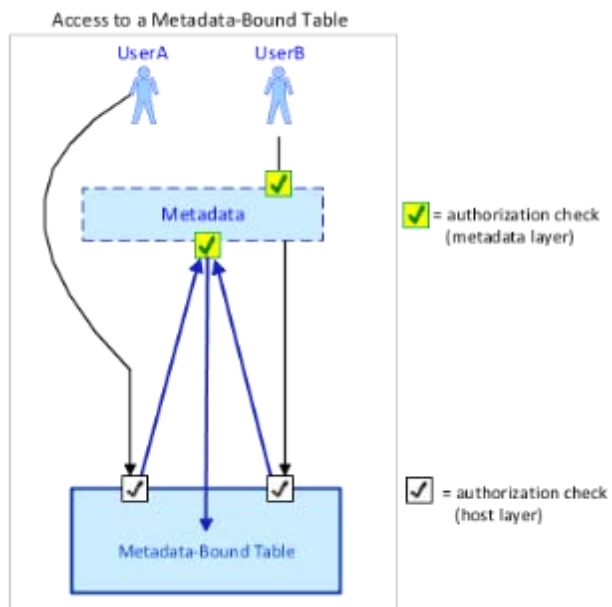

Figure 2. Authorization Checks for Metadata-Bound Table

To create a metadata-bound library, there are two main steps. The first step is to create a folder in metadata in which to store the information for your secured libraries. There is a special place to do this under the System folder.
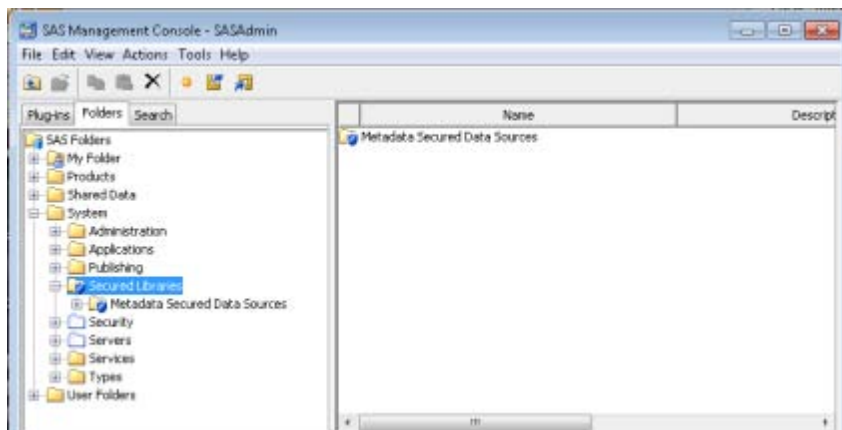

Figure 3. "Secured Libraries" Folder under System Folder

Grant the permissions that you need on the folder—all standard metadata authorization rules apply. Then you can create the library definition via SAS code. In the following example, I create the secured library called "Restricted Library".

```
libname secdata "C:/secret/data";
proc authlib library=secdata;
 create
   securedfolder='/System/Secured Libraries/Metadata Secured Data Sources'
   securedlibrary='Restricted Library'
   pw=not4U2no;

run;
```

AUTHDOMAIN Option on the LIBNAME Statement

For seasoned SAS Administrators, the concept of "authorization domain" (AUTHDOMAIN) is not new. This is really a grouping mechanism used by the SAS Metadata Server that enables you to configure different connection credentials for different resources available in the SAS environment. So, if you have multiple database sources such as Oracle, DB2, or others, you can define a different authdomain for each one in which to store user or group-specific connection credentials. This enables you to define different data sources in metadata without the user needing to know the specific logins.

The net result is that the AUTHDOMAIN option enables you to delegate the authentication by allowing SAS to "look up" credentials as needed using the SAS metadata environment. Every SAS/ACCESS® database engine supports AUTHDOMAIN=, in LIBNAME statements as well as in PROC SQL CONNECT statements. The LIBNAME statement could look like this:

```
libname ora10 oracle
   path=ora10g2 schema=PAYROLL
   AUTHDOMAIN="ORACLE"
```

The beauty of this solution is that SAS can resolve the database credentials differently for each user or group who runs this program by using the credentials that are defined in metadata for those identities.

WHY DOES IT MAKE ME FEEL GUILTY?

Anything that improves the security of data accessible via SAS applications is something I just love. Not everyone needs to lock down their data sources to the minute detail, but for those who do—these two tricks are essential elements of a comprehensive data security strategy.

In the past, we recommended different tricks and methods to essentially obfuscate critical details needed to access specific data sources as a workaround. Those workarounds are no longer necessary because the needed authorization controls are now part of the platform! Love this stuff!

WHY SHOULD YOU CARE?

Ever since SAS introduced metadata-based security, this has been needed to provide 360-degree control over SAS data sources. Metadata-bound libraries offer more robust protection than do other metadata-based approaches to access control. Because enforcement for a metadata-bound library originates from the physical data, that enforcement occurs regardless of which application is requesting access, including just straight Base SAS code.

The authdomain option enables you to hide connection details from the user, regardless of the application being used. There are no credentials to specify in the SAS code, there is nothing written in the SAS execution log file, and you can still control access at the user-level. It doesn't get any better than that!

GUILTY PLEASURE #3: METADATA FOLDERS

Metadata folders are those folders you see under the Folders tab in SAS Management Console. There is nothing more useful in SAS Metadata, in my opinion, than metadata folders. They are like the Swiss Army knife of SAS metadata. With metadata folders, you can slice and dice your SAS content, blend in authorization controls, and build up folder structures from other environments.

With SAS 9.3, there are a couple of new utilities that make metadata folders even more versatile. These are virtual folders and search.

Virtual Folders

A "virtual folder" is what it sounds like—it's not a real metadata folder that you set up in order to control access to content. It's a folder-like container that SAS defines to support promotion of security and server-related objects. These folders do not store metadata objects, and you will see these only in SAS Management Console. These virtual folders can be used to promote technical metadata objects such as servers, access control metadata, users, groups, and roles.
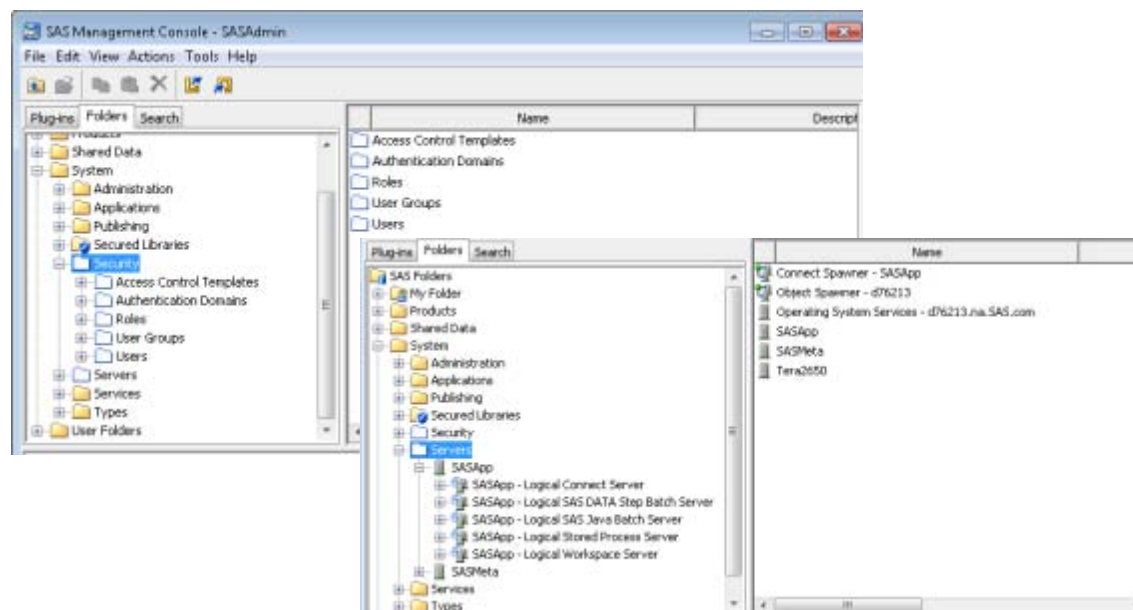

Figure 4. Virtual Folders

Metadata Search

The Search tab in SAS Management Console enables you to search for metadata objects based on object names, locations, descriptions, object types, creation or modification dates, keywords, or responsibilities.
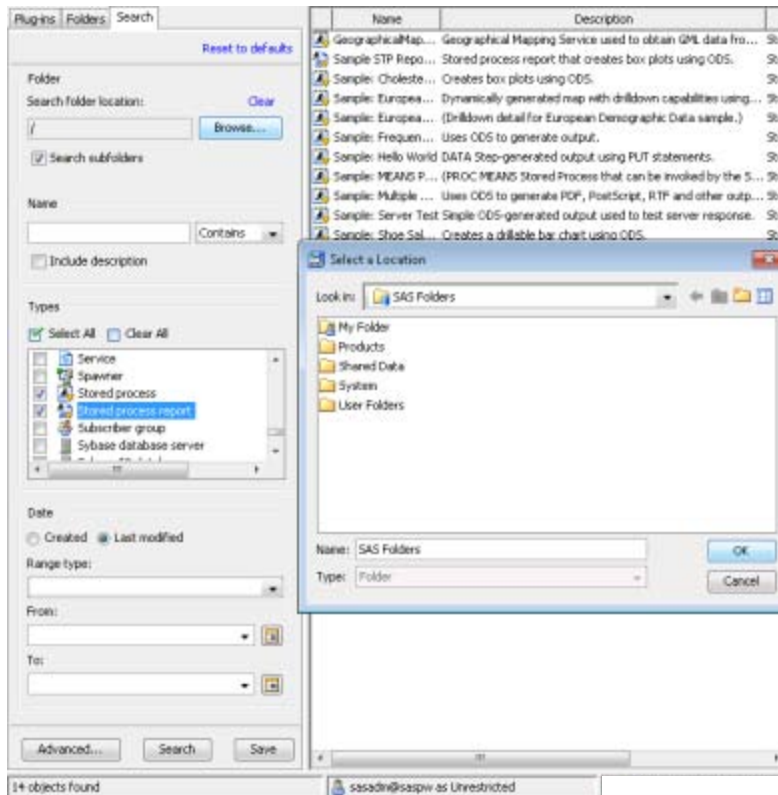
Figure 5. Metadata Search

After performing a search, you can click the Save button on the Search tab to specify a folder and location in which to store the search criteria. Opening a search folder ( )causes the search to be rerun and updated search results to appear.

WHY DOES IT MAKE ME FEEL GUILTY?

These two little tricks make life for SAS Administrators just that much easier. Virtual folders provide a mechanism to support promotion of technical metadata objects that really accelerate the setup of new environments. You can also use the export package to store a backup of these objects. Who doesn't love that?

The ability to save search criteria and results into a folder means that you can gather up content from across different SAS folders into a single location. And, because it's still a metadata folder, that means you can export those results into a SAS package file. Then you can use the search to find recently changed objects, project content that might be spread across folders from multiple teams, or any number of other use cases. Change management across environments just because it's easier. Ah… that's the ticket!

WHY SHOULD YOU CARE?

The really cool thing about these features (particularly search folders) is that you can more easily perform administrative tasks without having to compromise on the structure of the metadata folder tree in order to support business activities. You can pull together the content that you need for change management, backup, or other administrative tasks from across multiple folders by using the various search options available. And, you can save that criteria to rerun that consolidation whenever you need it.

CONCLUSION

For us SAS Administration geeks (I'm assuming you're one if you've read all the way to this point), it's always good to find out about little tricks that are available. SAS Management Console and the SAS Metadata Server are both so rich in functionality and capabilities that it's not the easiest thing to keep track of what you can do and how you can leverage them to make your job easier. There are things I run across that I just love and that I have found to be

extremely helpful and useful for me. What I have shared here are just a few of those things. I'm sure you have your own list as well, so feel free to share those with me—I would be interested to hear about them! If any of this was news to you, then I've done my job.

REFERENCES

- Hemedinger, Chris. 2010. *"*Five strategies to eliminate passwords from your SAS programs." Available at http://blogs.sas.com/content/sasdummy/2010/11/23/five-strategies-to-eliminate-passwords-from-your-sas-programs/.

- SAS Institute Inc. 2012. *SAS® 9.3 Guide to Metadata-Bound Libraries.* Available at http://support.sas.com/documentation/cdl/en/seclibag/65159/PDF/default/seclibag.pdf.

- SAS Institute Inc. 2011. *SAS® 9.3 Stored Processes Developer's Guide.* Available at http://support.sas.com/documentation/cdl/en/stpug/62758/PDF/default/stpug.pdf

- SAS Institute Inc. 2011. *SAS® 9.3 Intelligence Platform: System Administration Guide, Second Edition.* Available at http://support.sas.com/documentation/cdl/en/bisag/65422/PDF/default/bisag.pdf.

ACKNOWLEDGMENTS

I'd like to thank Catherine Hitti and Nancy Pipes for their excellent documentation. Also, I continue to appreciate the guidance from my R&D peeps, Bryan Wolfe and Larry Noe.

CONTACT INFORMATION

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

Diane Hatcher
SAS Institute Inc.
SAS Campus Drive, Cary, NC 27513
Work Phone: (919) 531-0503
E-mail: Diane.Hatcher@sas.com
Web: http://www.sas.com

SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration.

Other brand and product names are trademarks of their respective companies.