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# SAS Enterprise Guide® – Moving Beyond Your Initial Startup

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#### ABSTRACT

Once the programmer has grasped the initial concepts of using SAS Enterprise Guide (or SAS EG) including the Process Flow, the program file editor, and the handling of interactions with the interface (don't forget the F4 key!), there is a wide variety of additional functionality and features that are available. Some of these tools are more designed towards the individual programmer doing typical business analyst work, while other features have functionality extending out to assist the development and deployment of enterprise-wide applications.

## INTRODUCTION

For the professional programmer and data analyst, there are advanced features in Enterprise Guide that are useful both for analyzing data and creating applications that will be used both by the developer and by other information consumers throughout the enterprise. The initial part of this paper covers assorted SAS EG features that are useful to both the novice and experienced SAS programmer. The later part of the paper addresses issues more useful to SAS planners and administrators on an enterprise- wide scale, but should be understood by the typical SAS analyst so they can be conversant in overall system-wide goals and in making requests to administrators. These concepts are critical in a successful implementation since in general, most all of the components of the SAS Business Intelligence Platform are heavily dependent on Enterprise Guide for their development.

## **ACCESS VIA SAS INTEGRATION TECHNOLOGIES**

Many users are familiar with using PC SAS on a local workstation or laptop. Other users may access SAS by logging directly into the server operating system and launching SAS from there, or they may submit jobs remotely to the server via SAS/CONNECT®. Enterprise Guide can actually bring both scenarios together without requiring the user to know complex configurations or architecture.

SAS Integration Technologies®, a key component in the SAS foundation, is a separately licensed product that allows users multiple options for exploiting and integrating SAS inventory (data, programs, macros, meta-items). Using a comprehensive set of industry standards, it can facilitate asynchronous business processes, interact with directory servers for security and authentication, employ a publishing framework for non-SAS content such as documents and images, and prove a service-oriented rich architecture. In addition to having scalability flexibility, Integration Technologies also supports SAS Stored Processes which is a key element in deploying standard content to a wide variety of information channels.

With respect to Enterprise Guide, one of the most important features of Integration Technologies is that it allows the user sitting at a workstation to effectively have a "console" to the remote SAS server. Or, Enterprise Guide and Integration Technologies can also be configured to run off of a local PC version of SAS that is installed on the workstation itself.

#### WHY USE SAS WITH SAS INTEGRATION TECHNOLOGIES?

Whether on a local PC or on a server, traditional SAS usage of course could be as simple as opening up the SAS Windows Explorer and submitting code in the SAS program editor. But this limited approach has several drawbacks:

- 1. Programs, data, and output is not centralized;
- 2. IT cannot easily manage the system;
- 3. Applications do not have built in role-based security;
- 4. Reports and analysis are not readily available to the organization via flexible distribution channels.

There are of course various programming approaches and business processes that can help address these limitations, but with Enterprise Guide and Integration Technologies, these types of challenges can be resolved out of the box!

## **TECHNOLOGY OVERVIEW**

SAS Integration Technologies software facilitates asynchronous communication between Enterprise Guide (and other client tools) with a SAS instance. It is important to note that the Enterprise Guide application itself is actually just a dumb "client" and is not able to run SAS code on its own. In fact, on a local Windows workstation or laptop with PC SAS and Enterprise Guide, the processing initiated by Enterprise Guide on a PC SAS installation is done via the Integration Technologies components installed on the PC. Thus, from within Enterprise Guide, the server is actually referred to as "Local".



Figure 1 – SETINIT results

How do you know if SAS Integration Technologies is on the machine you are working with or attached to? You can do this in the basic SAS Program Editor or submit a job remotely. In your code, submit

#### proc setinit;

run;

on the machine where SAS is running – either local or on the server. A listing will appear in the log for all licensed software and SAS Integration Technologies will be displayed if it is licensed at your organization (Figure 1).

If you have a recent version of Enterprise Guide installed on your workstation, you will almost certainly have either a local version of SAS installed, or an available version of SAS on a remote server. You can check with your SAS administration team to find out more details on your specific configuration.

# LAUNCHING SAS ENTERPRISE GUIDE

One interesting configuration that companies may utilize is Windows Terminal Services to create virtual workstations that "host" the SAS EG application and other Windows client tools. SAS EG can always be installed on all of your users workstations, however this can be time consuming and difficult to maintain patches or upgrades. By installing the SAS EG application on a Windows Terminal Server, one can literally deploy the tool out to hundreds of users with a single install.



Windows has a client tool called Remote Desktop Connection (or RDC) built into all newer versions of workstation and server licenses. You can access it by left-mouse clicking the windows Start button, All Programs, Accessories, and selecting Remote Desktop Connection (Figure 2).

You will then see a dialog for selecting a remote server (Figure 3).

-	Remote Deskto Connection	q	
<u>C</u> omputer:	mpfmsas		
User name:	mpfmsas\sas		
You will be a	sked for credentials when you	connect.	

Figure 3 – RDC connection dialog

Once logged on the Windows Terminal Server, it will look similar to your normal Windows desktop however this instance will be running remotely somewhere else in your network.

Figure 2 – Launching RDC

Because multiple users can be logged into this one instance of a "desktop" at the same time, this allows for a single deployment of the SAS client tools, including Enterprise Guide (Figure 4). The impact of this for upgrades and patches can be significant. A single upgrade of software on a Windows Terminal Server that supports 100 users can all be done once rather than an IT administrator doing it 100 times on each local machine.

Note: SAS has made some subtle changes in the properties and display characteristics of the interface throughout the versions. The examples shown in this paper are from using SAS Enterprise Guide 5.1. The appearance of your interface may vary slightly, however the concepts should be the same.

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		mpfmsas - Remote Desktop Connection	
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	S Refresh Disconnect I Stop		
	E- Servers		
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raner	E I SASHELP		
<b>t</b> .)	E ∰ SASUSER		
	Files		
м	Beady	No profile set	ected :

Figure 4 – Opening SAS Enterprise Guide in a Remote Desktop Connection session



Figure 5 – Launching EG

A more common configuration of course is to simply install SAS EG directly on a Windows laptop or desktop. If you are attached to the network in your enterprise, you should be able to invoke Enterprise Guide by navigating through the Windows Start button and selecting All Programs / SAS / Enterprise Guide shortcut (Figure 5). If you are outside the corporate network, you of course will need to VPN into your company. Be careful however of the performance ramifications if your internet connection is slow. Do not hesitate to involve your enterprise networking personnel to assist with this as it is relatively easy to do for someone who knows the local architecture.

If you are launching Enterprise Guide for the first time, or if you have not previously configured it to connect to a remote server, you will only see the "Local" server as being available and "No profile selected" will appear in the lower right hand corner of the status bar (Figure 6).

Process Flow +	
▶ <u>B</u> un - ■ <u>S</u> top   Export - Sche <u>d</u> ule -   <u>Z</u> oom -	-
<	•
Task Status	
Task Status	

Figure 6 – EG with Local connection only

If you have a remote server available, you can click on the "No profile selected" status bar and it will display a dialog window that allows you to add or select existing connection profiles (Figure 7).

Profiles				
Name /	Machine	Port	User	Set Active
K K	magdev	8561	di.penix	<u>A</u> dd
SAS93BIDI	sas93bidi	8561	psi∖dj.penix	Modify
				Delete
	Profiles       Name     /       % <do a="" not="" profile="" use="">       Magdev     SAS938ID1</do>	Profiles	Profiles	Profiles       Name     Machine     Port     User       & do not use a profile>     Magdev     8561     dj.penix       SAS938ID1     sas93bidi     8561     pai'dj.penix

In the Connections dialog window, you can highlight other available server connections available in your organization. Note that your list may have LOTS of available servers depending on how many server licenses are available at your site.

Once a connection profile is selected, click on the "Set Active" button.

After you close the connection dialog, you will now see other various servers that are available within the connection. In this example, there are two servers – SASApp and SASMeta (Figure 8).

Figure 7 – Connections profile dialog



Also note that the "No profile selected" status has changed to the name of the connection profile that was selected. If you hover your mouse over the connection link, it will describe not only the server configuration settings, but also the user id that is connecting to the server.

This obviously brings up an interesting feature for applications that require security for the data and applications. By creating multiple connection profiles for multiple user id's on the same server, testers can easily flip back and forth between connection profiles to ensure security permissions have been applied correctly.

Figure 8 – EG with Local and remote server(s)

Create Profile	
Name:	
Dummy Test Account named Joe	
Description:	
Machine	
	Port:
SAS93BIDI	8561
Advanced Save login in profile User:	P <u>a</u> ssword:
psi∖joe.tester Aut <u>h</u> entication Domain:	
	Save Cancel

Setting up additional connection profiles are done using the same dialog window described in Figure 7 above. Click on the "Add..." button. A new dialogue will appear that allows you to enter the server and user id details (Figure 9).

In this example, a password does not need to be specified since the user id will be authenticated against a Windows Active Directory server.

Figure 9 – Creating new connection profile

## USING THE RIGHT LIBRARIES AND SERVERS

For beginning users of Enterprise Guide, it can often be confusing where SAS programs are submitted or even where the data is coming from. To highlight this point, let's take a look at libnames such as WORK or SASHELP.



Figure 10 - Libraries

Note that both the Local server and the remote SASApp server both have the WORK and SASHELP libraries (Figure 10). This can be even more confusing if a user or organization replicates their business library names at both the local and server instances.

What if user drag-and-drops the SASHELP.CLASS table from both the Local and the SASApp server and then builds a Pie Chart for each one of them? Unless you manually change the displayed names of the data sets in the Process Flow, users may be confused as to where the data is coming from (Figure 11).

But done correctly, and with some awareness and collaboration from the development team members in advance, this can offer some nice advantages by utilizing replicated data both locally or on the server.

For example, let's suppose your SAS licenses have different product bundles for the PC and Server. The Enterprise Guide application will allow you to run some programs locally, while running other programs remotely – all within the same work flow.



Another scenario where licensing on the local and remote server are identical could provide

Figure 11 – Process flow example

analysts on an airplane the ability to work out of the office. If the developer replicated copies of data and programs on their local PC, he/she could develop code in areas or parts of the world where VPN or other internet connections may not be available.



If the descriptive labels of data are not modified to indicate location of server source, users can always hover their mouse over the dataset and a property summary of the table will be displayed (Figure 12).

Figure 12 – Properties hoover

## METADATA CONTENT AND FOLDERS

Another advantage of Enterprise Guide on the SAS Foundation Platform is the usage of metadata. Metadata is stored and managed in SAS so that it can leverage and facilitate the reuse of existing libraries, table definitions, reports, users & groups, permissions, business rules and much more.

To the left of the Enterprise Guide application window, users can quickly switch between the EG Task List, SAS Folders, Server List, Prompt Manager, and Data Exploration History. As noted earlier in this paper, some of these

features and usability has changed slightly over the life cycle of the application. A screen shot of an example SAS Folders list is shown below (Figure 13).





In this example, I will save the project in the My Folder location in the metadata (Figure 15). This is a personal location that each user on the system is allocated. Only that specific user can write or read files from this metadata folder.

Save in:	SAS Folders	• • • 🖬 🗙 🍃 🛅	• \$3	
📴 Desktop	Name	Description	Туре	Created
	My Folder		Folder	11/4/2011 1:20:0
My Documents	POC		Folder	3/12/2012 11:35:
1 My Computer	Products	Reserved for content delivered with SAS pr	Folder	9/17/2011 6:33:2
3 my computer	PSITestArea		Folder	12/8/2011 10:30:
My Network	Shared Data	Folder for shared libraries, tables, cubes, an	Folder	9/17/2011 6:33:2
Places	SQL Libraries		Folder	10/31/2011 5:36
SAS Folders		111		•
	File name:	MWSUG 2012		-
	Files of type:	Enterprise Guide Project Files		-

Figure 15 – Saving EG in a metadata folder



Once the save is complete and you click on the Refresh icon, you will then see that the project was saved in the My Folder location (Figure 16).

# **CREATING A SAS STORED PROCESS**

The primary mechanism for deploying and distributing reports to multiple users via multiple interfaces is done via the SAS Stored Process. Although a Stored Process can be used to do other tasks like execute data integration job flows, or sending email alerts for example, this paper will focus on an example of allow end users to consume a "standard" report.

For those who are unfamiliar, a SAS Stored Process is essentially the same as normal SAS code in the Base SAS language. The difference is that the program file does typically contain other header and footer information in the code. Without going into the complexities of what is in the Stored Process code "wrapper", think of it as instructions that allow SAS Integration Technologies to make sure the code can be deployed on different platforms and different client interfaces.

Creating a stored process is very easy in Enterprise Guide. Using the same SASHELP.CLASS example of a simple pie chart running on the remote SASApp server, the next steps will demonstrate how to create a stored process and deploy it out to other information consumers.

The first step in this example is to create a simple Pie Chart from the SASHELP.CLASS dataset. The Pie Chart simply generates a graph based on gender (Figure 17).



(Note: This paper will not go into the steps as to what options were specified to create the Pie Chart and it assumes the reader has basic knowledge of creating reports in SAS Enterprise Guide.)

Figure 17 – Sample Pie Chart from SASHELP.CLASS

Once the report flow has been created, right-mouse click on the Process Flow window and select Create Stored Process... to launch the wizard (Figure 18).



#### Figure 18

Screen 1 of 6 (for EG version 5.1 on SAS 9.3) will display a dialogue for the user to supply details about the Stored Process (Figure 19).

<b>1</b> of 6 Name and [	Description		<u>s</u> .sa
Na <u>m</u> e:			
MWSUG Standard Pie Chart			
ocation:			
/My Folder			Browse
Example: /My Folder/SPs/Pn Description:	oc One)		
This is a place to put an option	nal Description		
Keywords (one per line):			Add Keyword
Pie			
MWSUG			Delete Keyword
Gender			
Responsibilities:			Add Besponsibilit
	Name	Role	/ ad <u>m</u> osponalbility
			Delete Responsibil
Make 9.2 <u>c</u> ompatible versi	on		
Specify one or more users who r needed to make changes to	are responsible for this stored process. the stored process.	These users are the people you would	Contact if you had questic More (F1)



• In the location box, navigate to the desired metadata folder where you would like to save the stored process - /My Folder.

- Enter an optional Description.
- Enter optional keywords

• For SAS 9.3 you can check the option to make it 9.2 compatible. Leave that blank.

• Leave the option to Hide from user blank.

Figure 19 – Stored Process Wizard Screen 1



Figure 20 – Stored Process Wizard Screen 2

Screen 2 of the wizard displays all of the SAS code that was auto-generated in the Process Flow window (Figure 20). An important note is that the user could insert and replace whatever code was desired and convert legacy programs into a Stored Process.

For most users, there is no need to select any options so you can simply click the Next button.

3 of 7 Execution Options         Application server:         SAShop         Server type:         • Default server:         • State the option to allow the clent application to specify the server.         • State the option to allow the clent application to specify the server.         • State the option to allow the clent application to specify the server.         • State the option of the stored process uses sessions of if uses replay for example, to produce graphics in atreaming output).         • Workspace server only         • State at reposition and execution:         • Allow secution on other application servers (store source code in metadata)         • State a repository ""         • WMSUG Standard Pe Chast ass         • Qervente codeing the         • Qervente coding the         Reaut capabilities:       © gream         • Detack       Nextor	Create New Stored Process	
Application server: SASApp  Server type: Default server Sales the option to allow the clerit application to specify the server. Societ application server only Societ the option of the scher process must be run under the client identity. Societ application and execution: Allow execution and execution: Allow execution on other application server only Socie application server Soci	3 of 7 Execution Options	<u>s</u> sas
Solve the construction of the accel process must be run under the client identity.  Solve the client of the accel process must be run under the client identity.  Source code location and execution:  Allow execution on other application server only  Source code solution and execution:  Allow execution on other application server only  Source code solution and execution:  Allow execution on other application server only  Source code solution and execution:  More generative as a monotone of the solution of the server.  Source code solution and execution:  More source code mapplication server only  Source file:  More generative  M	Application applier	
Sever type: Default server Sever type: Default server Sever type: Sever type: Sever type: Sever type: Sever type: Sever type: Sever type: Workspace server only Sever type: More secution and execution: Allow execution and execution: Allow execution on other application server only Sever type: Sever t	SASAco	•
Sector in a sponto and the clinic spectration of it uses mplay for example, to produce graphics in streaming output) Sector this option if the stored process must be nun under the client identity. Sector close location and execution: Allow execution on other application server only Allow execution on selected application server only Source code in metadata Source file: MUSUG Sandard Pe Chert ass Convents cating file Reaut capabilities: Source (Fil) More (Fil)	Server type: Default server Select this action to allow the client production to	month the server
Surce code location and execution:  Allow execution on other application server only  Source code is neededad application server only  Source code expository:  Source file:  MWSUG Standard Pe Chest ass  Converting externs [1] gream [2] godage  More [F])  More [F])  Case (*) Next) Einish Converting [1]	Select this option to allow the chert approach to Select this option if the stored process uses sessio Workspace server only Select this option if the stored process must be run	specify the server. ne or if it uses replay for example, to produce graphics in streaming output). under the client identity.
Source code spootory:	Source code location and execution: Allow execution on other application servers (store Allow execution on selected application server only Store source code in metadata Store source code on application server	source code in metadata) /
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Source (le: WYSUG Standard Pe Chot ass Quenets existing lite Result capabilities: [V] Stream [V] Eackage More (F1)	*** Select a repository ***	✓ Manage
HWSUG Standard Pe Chat aas Qverwite existing file Result capabilities:	Source file:	
Overwite existing file Result capabilities:      Orean      Deckage More (F)      CBack      NextD Finish Cance	MWSUG Standard Pie Chart.sas	
Result capabilities: 📝 gream 📝 Bockage More (F1) Back V Next> Finish Cance	Qverwrite existing file	
More (F)	Result capabilities: 🗹 Gream 📝 Package	
Cance Can		More (F1)
	1	<back vext=""> Finish Cancel</back>

Figure 21 – Stored Process Wizard Screen 3

Screen 3 of the wizard will allow the developer to specify various Execution Options (Figure 21).

The Application server is where you would like the Stored Process to be executed at. Note that Local server option is not available. It is not practical to have other users execute the stored process on your local machine. Most users will simply use the default server SASApp.

A common misconception among some people is that they think that a SAS Stored Process must be run on the SAS Stored Process Server. A SAS Stored Process can also be run on the Workspace Server. There are numerous pros/cons for doing this – each of which is out of scope of this paper, but in general the Workspace Server will run the process on the SAS server using the ID of the individual calling the Stored Process. If a Stored Process is executed on the SAS server using a single generic account, typically called SASSRV. In previous versions of SAS, the developers had to specify one server or the other. In version 9.3, there is an option to allow the client application to specify which server it is executed on. For this example, select Workspace server only.

The next option is to specify whether the Stored Process can be executed on other application servers, or if it can only be executed on the selected application server. With that option, the user can also store the Stored Process code on the application server (in the form of a \*.sas physical file), or it can be stored in the metadata. For this example, select Store source code in metadata.

Finally, leave the default Result capabilities checked for Stream and Package. Stream output is typical for Web applications whereas a Package output is best used for Enterprise Guide output.

4 of 7 Librefs	5.				S.Sas
References to built-in li	braries				
Library name		Туре	Source host		
SASHELP		INPUT	sas93bidi.datag	gister.com	
•		m			
leferences to libraries	requiring the generation of a LIBN	IAME statement			0
د [		III			
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<ibname gustom="" libna<="" statementuee="" td=""><td>AME statement</td><td>m</td><td></td><td></td><td></td></ibname>	AME statement	m			
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Screen 4 of the Wizard allows the developer to specify custom library references (Figure 22). In general, if the output was developed using the Enterprise Guide pre-defined libraries and reporting tasks, the Stored Process wizard will figure out the correct libraries for you.

Leave everything as default and click the Next button.

Figure 22 – Stored Process Wizard Screen 4

5 of 7 Prompts	3		<u>s</u> .sa
Input Prompts:			
Displayed Text	Name	Type Standard group	Edit
			Sharing •
			Fleview
			Delete
Output Parameters:	**************************************	[ <sup>1</sup>	
Name	Туре	Displayed Text	New
			Edit
			Delete
			More (F1)

Screen 5 of the wizard will allow you to specify prompts (Figure 23). For this example, we are not going to define any.

Click on the Next button.

Figure 23 – Stored Process Wizard Screen 5

<b>6</b> of 7 Data Source	es and Target	s		S.Sa
Data Sources (input stream	s to a stored proce	ess):		
Fileref / Table Parameter	Content	Label	Description	Edit
Data Targets (output strean Fileref / Table Parameter	ns from a stored pr Content	ocess): Label	Description	Delete
				More (F1)

Screen 6 (SAS 9.3) of the wizard will allow you to specify Data Sources and Targets (Figure 24). If you would like your Stored Process to have Input Streams or Output Streams, you can specify them here. For this example, we are not going to define any.

Click on the Next button.

Figure 24 – Stored Process Wizard Screen 6

Create New Stored Process	X
<b>7</b> of 7 Summary	<u>s</u> sas
Descriptive information	<u>م</u>
Name MWSUG Standard Pie Chart	
Location /User Folders/dj.penix/My Folder/	E
Description This is a place to put an optional Description	
Usage Version 2.0	
IsHidden No	
Keywords Pie MWSUG Gender	
Responsible parties None	
SAS code	
* Beain EG generated code (do not	edit this line):
	Show full SAS code Copy to clipboard
Run stored process when finished	
	More (F1)
	< <u>Back</u> ▼ <u>N</u> ext> <u>Finish</u> Cancel

Screen 7 of the wizard is simply the Summary of all of the previous steps (Figure 25).

There is an option to "Run stored process when finished". This will allow the developer to test the Stored Process before deploying it out to the other users.

Leave the option checked and click the Finish button. It will generate the same Pie Chart that was created in the Process Flow (Figure 26).

Figure 25 – Stored Process Wizard Screen 7



Figure 26 – Results of the executed Stored Process

Note that there is a new icon that looks like a SAS Program with an inverted orange triangle. This is the standard icon for a SAS Stored Process.

## SHARING AND DISTRIBUTING CONTENT ACROSS MULTIPLE INTERFACES

Now that we created the SAS Stored Process, we can execute it on multiple interfaces. Depending on the licensed suite of SAS products at your site, these may or may not be available to you.

The SAS Add-In for Microsoft Office® is a component that allows end users to build and run SAS Tasks as well as execute a SAS Stored Process. Available for Excel (Figure 27), Word, PowerPoint, and even Outlook, users can get SAS reports from interfaces that they are familiar with.

Ca	39	(4.).≑						-	Book1 -	Microsoft Excel
	Home	Insert Page Layout	Formulas	Data	Review	View	SAS			
SAS Data	Tasks *	Reports Quick SAS Start + Favorites +	Refresh	Modify Properties	Manage Content	Tools	Relp			
		Insert 5	Sele	ction		Tools				
	A1	Run a report								
1	A	Enables you to open a repoi shared repository. These rep be created by several SAS applications, such as SAS En Guide and SAS Web Report	rt from a ports can terprise Studio.	F	G		Н	I	J	К
3 4 5 6		SAS Add-In 5.1 for Micro Press F1 for more help.	soft Office							

Figure 27 – SAS Add-In for Microsoft Office 5.1 ribbon for Microsoft Excel 2007

The Add-In will create a new SAS menu and depending on the version of Office and SAS that you have, the ribbon will look like the figure above. By clicking on the Reports button, you can navigate in the SAS metadata folder structure and specify the Stored Process we just created in the previous steps (Figure 28).

Look in:	My Folder	🔹 🗸   🖻 🔹 🖡	\$5	
Galaria SAS Folders	Name	Description	Туре	Created
Servers Sectop My Documents My Computer My Network Places	I K HWSUG Standard Pie Cha	t This is a place to put an optional Description	Stored pr	8/30/20
	•			
	File name:         MWSUG State           Files of type:         All File Type	tandard Pie Chart 99		

Figure 28 – Selecting a Stored Process report in Excel 2007







Figure 30 – Stored Process Results in Word



Figure 31 – Stored Process Results PowerPoint

Figure 32 – Stored Process Results in Outlook

🧭 SAS Web Report Studio : Edit Report - Windows Internet Explorer 🚱 🔵 🗢 🗕 🖇 http://sas93bidi.datagister.com:8080/SAS 👻 🍫 🗙 💽 Bing <del>ب</del> م 👷 Favorites 🧕 SAS Web Report Studio : Edit ... 🍡 🏠 🔻 🔝 👻 🖃 🖷 🖉 🖉 Bage 👻 Safety 👻 Tools 👻 🕢 👘 **Sas** SAS Web Report Studio . Untitled Report File Edit View Insert Data 😭 🔒 Edit View 1 /1 🔲 🔲 🖂 🕍 🖄 🕼 📀 🖿 🚇 🛄 🖓 ☆ Table of Contents Options ▼ × Header 👻 Section1 -ጵ Section Data Options 👻 tored Process' \*\* /**!**` E. 8 -可 아 Footer -\_\_\_\_6l\_\_\_ \_\_\_\_\_

The Stored Process can also be set up to be displayed on a Web Report. In the SAS Web Report Studio (WRS) application, click and drag the Stored Process icon over to a report layout cell (Figure 33).

Right-mouse click on the icon to navigate and select the same Stored Process that was created in previous steps (Figure 34).

Click on the View tab and the Stored Process will execute and then display the Pie Chart (Figure 35).

Figure 33 – Setting up a Web Report with a Stored Process

ocation:		
📸 My Folder		
Name	Date	Description
🐴 MWSUG Standard Pie Chart	8/30/2012	This is a place to put an optional Description

Figure 34 – Selecting the Stored Process in WRS

SAS Web Report Studio : View Report	Windows Internet Explorer	
🚱 🔵 🗢 🛐 http://sas93bidi.datagi	ster.com:8080/54 👻 😽 🗙 📴 Bing	+ م
🙀 Favorites 🛛 🖇 SAS Web Report Stu	dio : Vie 🏠 🔹 🔝 👻 🖃 🗮 🕈 Page 🕶	<u>S</u> afety ▼ T <u>o</u> ols ▼ 🕢 ▼
SAS Web Report Studio 🔹 U	Log Off dj.penix ntitled Report	Preferences   Help*
File Edit View Data 😭 🚰 🛃	Edit View	1 /1
≪ Table of Contents Options →	Pie Chart	
Section1 -	F 9	
😞 Section Data Options 🔻		
		=
	M	
	10	-
Done	Internet   Protected Mode: Off	+ •

Figure 35 – Viewing the Stored Process in WRS

SAS Stored Processes can be used in many different client applications. Here is a brief list of some of the SAS tools you can use.

- JMP
- SAS Add-In for Microsoft Office
- SAS BI Dashboard
- SAS BI Web Services
- SAS Data Integration Studio
- SAS Information Map Studio
- SAS Stored Process Web Application
- SAS Web Report Studio
- Stored Process Java API
- Stored Process Windows API
- SAS Information Delivery Portal
- SAS Code (New in 9.3!)
- SAS Enterprise Guide

Now that you see how easy it is to create a stored process and deploy information, what is stopping you from taking your existing SAS legacy code and converting them to Stored Processes? This would immediately make them available in multiple interfaces, including the web. Making your reports web ready has never been this easy!

## PERMISSIONS AND ROLE BASED ACCESS

Although tools to manage user permissions and customize functionality based on roles are not included in the Enterprise Guide application, they are a part of the SAS Management Console (SAS MC). End users of EG may not be aware of such features since they can only be modified by someone who as access to the SAS MC and has the necessary permissions to adjust the settings. You might need to talk with your administrator to discuss if they are aware of these capabilities.

In order to set up your Enterprise Guide system with robust permissions and role based functionality, it is first important to understand the concepts of three (3) key metadata items in the SAS MC application:

- Users individuals who log into one or more SAS applications
- Groups teams of one or more Users
- Roles settings of capabilities in the system

After logging into the SAS MC, navigate to the Plug-ins tab. Here you will see various components to manage the SAS metadata, including the User Manager. If you click on the User Manager item, a pane on the right side of application will appear. Make sure that Show Users is checked, and to make it easier to filter and see ONLY users, uncheck the other boxes for Show Groups and Show Roles (Figure 36). Some of the users are out of the box and are created during the installation time, such as the SAS Demo user or SAS Administrator user.

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	SAS Administrator SAS Anonymous Web User		

Figure 36 – Managing Users in SAS Management Console

Next, check Show Groups and uncheck Show Users. The list of each of the items in this section will contain a list of Groups that are defined in the system (Figure 37). Many of these are out of the box Groups that we created during the installation, such as the SASUSERS or BI Dashboard Administrators. Others may be custom based on the needs of the business. It is important to note that Groups are typically utilized to authorize access in a READ/WRITE/DELETE fashion for data, folders, reports, and metadata objects for example. Groups, and Users, are typically either granted access or they are denied.



Figure 37 – Managing Groups in SAS Management Console

Next, check the Show Roles box and uncheck the Show Groups box (Figure 38). This now displays a list of available Roles in the SAS system. Roles allow Users or Groups the capabilities to do certain functions within an application. Note that in the example there are four (4) different Roles that are specific to Enterprise Guide: Advanced, Analysis, OLAP, and Programming.

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SAS Management Console	Show Users Show Groups Show Ro	xes	
Environment Management	User, Group, or Role /	Description	Job Title
C Authorization Manager     Data Library Manager     Soundation Services Manager     Model And Anger     Metadata Manager     Publishing Framework	Add-In for Microsoft Office: Advanced     Add-In for Microsoft Office: Analysis     Add-In for Microsoft Office: OLAP     BI Dashboard: Administration     Comments: Administrator	Provides all capabilities in the SAS Add-In for Microso Provides basic data analysis, reporting, and other ca Supports viewing OLAP cubes in PivotTables and pro Provides SAS BI Dashboard administration capabilities.	
Schedule Manager     Senser Manager     User Manager     Monitoring	Enterprise Guide: Advanced     Enterprise Guide: Analysis     Enterprise Guide: OLAP     Enterprise Guide: OLAP     Enterprise Guide: Programming	Provides all capabilities in SAS Enterprise Guide. Provides basic data analysis, reporting, and other ca Supports viewing OLAP cubes in the OLAP Analyzer Provides SAS programming, stored process authorin	
Application Monitor     Maintenance     Application Management	Job Execution: Job Administrator	Provides all capabilities for the Job Execution Service Provides job and task definition capabilities.	
Enterprise Miner	Job Execution: Job Scheduler	Provides job scheduling capabilities. Provides normal job submission capabilities.	
	Management Console: Advanced Management Console: Content Management	Provides access to all plug-ins in SAS management C Provides access to the Folders tab, User Manager, Li	
	Artadata Server: Operation Metadata Server: Unrestricted	Supports adding repositories and operating the meta Provides all capabilities in SAS Management Console	
	Theme Designer for Flex: Administration	Supports management of users, groups, and roles ot Provides Theme Designer administration capabilities.	
	Web Report Studio: Advanced	Provides all capabilities in SAS Web Report Studio ex Provides report creation capabilities.	
	🖗 Web Report Studio: Report Viewing	Provides report viewing capabilities.	

Figure 38 – Managing Roles in SAS Management Console

Let's first explore the properties for the Advanced role. Right-mouse click on the Enterprise Guide: Advanced role and select properties.

General	Members	Capabilities	Contributing Roles	Authorization		
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Figure 39 – Viewing members of a Role

Some roles have implicit capabilities, see the description on the General tab.  Assigned capabilities ( Pachations Pachatity Pachat	General Members	Capabilities	Contributing Roles	Authorization	1			
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If you select the Members tab, you will see all Users and Groups who are assigned access to this role (Figure 39).

Adding or removing members to this role is as easy as moving them back and forward with the arrows.

Next, click on the Capabilities tab. You will now see the various applications that are relevant to this role (Figure 40). In this example, because we selected a role related to Enterprise Guide, the Enterprise Guide 4.3 tree icon is shaded black whereas the other applications, such as Add-In 4.3 for Microsoft Office, Web Report Studio 4.3, etc. are all un-shaded.

Figure 40 – Viewing capabilities of a Role



If we expand the Enterprise Guide 4.3 application tree, we will now see several different capability categories (Figure 41) including:

- Open or Import
- Save or Distribute
- Content
- Options
- Tools and Help
- Data
- Describe
- Graph
- ANOVA
- Regression
- Multivariate
- Survival Analysis
- Capability
- Control Charts
- Pareto
- Time Series
- Data Mining
- and Custom Tasks

If we expand each of the sub-trees, we see each of the specific capabilities that users can, or cannot do based on their membership to this Role (Figures 42 & 43). This out of the box Role can be customized, or companies can create their own custom Roles for each of their applications.

Figure 41 – EG Capability sub-categories



Control Charts Wexter Box Chart Wexter C Cha	<ul> <li>Time Series</li> <li>Prepare Time Series Data</li> <li>Basic Forecasting</li> <li>ARIMA Modeling and Forecasting</li> <li>Regression Analysis with Autoregressive Errors</li> <li>Regression Analysis of Panel Data</li> <li>Create Time Series Data</li> <li>Forecast Studio Create Project</li> <li>Forecast Studio Open Project</li> <li>Forecast Studio Open Interpret</li> </ul>
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Figure 43 – Individual capabilities (cont.)

A few good examples where this functionality would come in handy?

- Prevent business users from accidentally creating an advanced SQL query that would generate a run-away process.
- Simplify the interface functionality for high-level executives who might be overwhelmed by a complex interface.
- Prevent users from downloading data files to the PC, which might create security problems in highly
  regulated environments.

Please check with your SAS administrator if you need to implement any of these role based features.

#### CONCLUSION

The few examples provided herein are intended to give the audience an overview of how important SAS Enterprise Guide is to the overall SAS Business Intelligence Platform. While the EG interface can be used as a simple replacement for the legacy SAS Windows Explorer, leveraged properly it can help with security, developmental efficiency, centralize maintenance, and facilitate enterprise wide distribution of your reports and analysis. The mechanism that can make this all happen is SAS Integration Technologies.

With the usage of Local and remote Servers, developers can work in situations where there is no available network connectivity, and leverage instances where site licenses are different throughout an organization.

#### REFERENCES

Overview of SAS Intelligence Platform SAS Add-in for Microsoft Office SAS Overview of Stored Processes

#### **CONTACT INFORMATION**

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