A Guide to SAS® for the IT Organization

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ABSTRACT

SID file, SAS® Deployment Wizard, SAS® Migration Utility, SAS® Environment Manager, plan file. SAS® can seem very mysterious to IT organizations used to working with other software solutions. The more IT knows and understands about SAS—how it works, what its system requirements are, how to maintain it and back it up, and what its value is to the organization—the better IT can support the SAS shop. This paper provides an introduction to the world of SAS and sheds light on some of the unique elements of maintaining a SAS environment.

INTRODUCTION

Your company has made a wonderful decision–to use SAS® software to manage, analyze, and report on your data in order to advance your business to the next level. Perhaps your SAS software will be used to streamline and improve your marketing campaigns, better manage supply and demand for your products, predict when maintenance should be performed on your equipment, reduce risk, identify fraud, or perform any of the thousands of other tasks SAS is used for on a daily basis. But before things can start to hum, the SAS software has to be installed and configured, and IT organizations often find performing these tasks to be quite challenging. A contributing factor is the long list of mysterious terms and abbreviations that are part of the SAS vocabulary that you have to navigate. SOE, SID, SDW, SMC--the better you understand what these acronyms mean and the what, why, and how of these features, the easier your job of getting SAS up and running will be. This paper provides an introduction to the world of SAS and sheds some light on the unique elements of maintaining a SAS environment.

First, an overview of SAS software as a whole. SAS, the company, offers an extensive list of software products and solutions, some portion of which your company licenses. You might license a series of modules such as Base SAS®, SAS/STAT®, and SAS/GRAPH®. In addition, you might license one or several solutions such as SAS® Enterprise Miner™, SAS® Campaign Management, SAS® Risk Management for Banking, or SAS® Visual Analytics. These solutions in turn come bundled with an assortment of the previously mentioned modules as well as with web components and other files essential to their operation. A complete list of all the SAS products and solutions is available online.

THE SOE: WHERE IT ALL STARTS

The first encounter the IT organization often has with SAS software is through the **SOE** (**SAS Software Order Email**). This e-mail is sent to the individual at your site who is designated as the **SAS Installation representative**. The SAS Installation representative, despite the title, might be a SAS user or a procurement analyst who is typically not responsible for installing and configuring SAS software. Therefore, this e-mail needs to find its way into the hands of the group who will be responsible for these tasks. The SAS Software Order Email includes these details:

- The SAS software order number
- The installation key
- The type of deployment (planned or unplanned)
- The SAS Technical Support site number

The SOE also includes a list of the licensed software. If the SOE is for a renewal order rather than a new order, it lists the date on which the software will expire. Review the list carefully and raise questions immediately with SAS Contracts Support if it seems incomplete or if the expiration date isn't a date you expect (usually one year from the license date). Keep this e-mail handy; information included here will be needed when you open tickets with SAS Technical Support, have questions for SAS Contracts Support, or work with your Customer Loyalty representative, as well as when you install software for the first time or update to a new release.

The licensed products that are listed in the SOE are organized by site, with each site identified by a unique site number. A **site** is a way of identifying a collection of licensed software, and while it might correspond to a physical

site where your company is located like the New York office or the Minneapolis office, it can also refer to a particular server on which software is installed, or an organization within your company that uses, say, SAS Enterprise Miner to do data modeling, or an organization that just licensed new software to complement already-licensed software. It's a good idea for the IT organization and SAS Administrator who support the SAS users to know which site number corresponds to which location/servers/users.

The SOE also provides you with a three-step process for installing and configuring your SAS software.

SAS DOWNLOAD MANAGER: UTILITY TO DOWNLOAD THE SAS SOFTWARE DEPOT

The first step listed in the SOE is to download a Java application called the **SAS Download Manager**. In order to ensure that you download the correct version of software for your hardware platform, you click the Request Download button corresponding to 64-bit enabled AIX, Linux for x64, Microsoft® Windows® for x64, z/OS, or any of the other supported operating systems. The Download Manager web page also provides links to additional installation documentation and readme files.

You will notice that in order to download the SAS Download Manager, you need to create a **profile** that establishes a login to the Support website. There are numerous benefits to having a profile, such as access to the full breadth of SAS technical documentation and RSS feeds and other community opportunities. Another benefit to having a profile is My SAS, which allows you to view information that is specific to your use of SAS including Technical Support tracks you've opened, a list of your SAS representatives, and more. Creating a profile is highly recommended, whether or not you are responsible for downloading or installing SAS software.

THE SAS SOFTWARE DEPOT: YOUR REPOSITORY OF SAS SOFTWARE

The second step listed in the SOE is to use the SAS Download Manager to download the physical software to a hardware location you designate. The location of this repository, referred to as the **SAS Software Depot**, does not need to be the same as the location where the software will ultimately be configured, as long as it is accessible by those servers. It contains your company's collection of catalogs, XML files, .exe files, .dlls, templates, and other files that make up the SAS modules and solutions. The SAS Software Depot might be quite large; its total size is listed on the SOE. When you request the software download, you are asked for your SAS software order number and your installation key. You might recall that these pieces of information are provided in the SOE.

The logic of having a centrally located Software Depot on your hardware is that it can now be used to install the appropriate SAS products anywhere at your company without again having to electronically access the SAS website. It is almost certainly going to be quicker to copy software to different locations on your intranet and inside your firewall than to download the whole depot via the Internet–so you do that step only once. By the way, if it is not possible for you to perform an electronic download of the software, you can request tape or cartridge media by contacting a SAS Contracts representative.

A good way to verify what has been downloaded into your SAS Software Depot is to look at two documents found in the software depot:

- **depotsummary.html** is located in the root directory of the software depot. It confirms your order number, provides a list and description of the software you have ordered, and shows the date on which the software was added to the depot.
- **ordersummary.html** is located in an order-specific subdirectory of the install_doc directory of the software depot. It lists the software you have ordered plus all supporting software, including .jar files, Microsoft run-time components, threaded kernel extensions, and so on. This list is quite long.

INSTALLING AND CONFIGURING YOUR SAS SOFTWARE

The third step listed in the SOE is to install and configure (or **deploy**) your software. This step points you to the QuickStart Guide, which you can access from a link in the depotsummary.html document mentioned above and which can also be found online. This short document reiterates the value of confirming your order, provides links to documentation to check for system requirements, and asks you to check that you meet the requirements for the SAS Installer account so that you will have the necessary permissions to install the software. In addition, the QuickStart Guide lists a number of steps for completing your software deployment, including the following:

- Recommending that if you are modifying an existing SAS deployment, you perform a backup before you install your new SAS software order. This good advice, though easily overlooked, can save much time and trouble should there be a need to roll back the modification process.
- Ensuring that if you are performing a planned install (see below), you have completed the pre-installation checklist(s) that are appropriate for your software orders. Pre-installation checklists are provided with the SAS Deployment Wizard (SDW) or can be downloaded along with the deployment plan.
- Reminding you to follow any supplemental instructions for deploying SAS software and required third-party software.
- Directing you to use the SAS Deployment Wizard found in your SAS Software Depot to deploy your software.
- Performing any additional steps required for your deployment, such as product-specific, post-installation steps.

For each of these steps, there are links to additional documentation.

By the way, having two stages for downloading and then deploying SAS software is not that different from downloading and installing printer software or a new version of Microsoft Office on your home computer. It's the names and terms for the applications and various steps in the SAS software deployment that are unique to SAS, as well as the fact that enterprise software requires more setup and planning than PC software does. For metadata-based implementations, some of that planning takes place through the use of the deployment plan.

THE DEPLOYMENT PLAN: THE MAP FOR YOUR SOFTWARE DEPLOYMENT

Many SAS customers use a multi-tiered architectural framework for their software implementation. For example, a two-tiered environment might consist of all of the SAS components installed on a server and SAS users accessing clients like SAS® Enterprise Guide on their PCs. A three-tiered environment adds a separate metadata server or a web tier. Numerous configurations are possible. How does SAS know where to install the necessary parts of software across different hardware? The answer is a **deployment plan,** sometimes referenced as a **plan file**. This XML file provides a topology or map describing where the software components will be installed. A deployment plan for your installation is provided with the SAS Deployment Wizard (see below), or you can choose to download a standard deployment plan.

Note that not all implementations of SAS software require a deployment plan. In fact, the SOE indicates, based on the software licensed, whether a "planned" or "unplanned" deployment is needed. A planned deployment means that there are multiple tiers on one or more machines involved, one tier of which is for metadata. An unplanned deployment means that no deployment plan is needed.

In some cases, a custom plan file is required. This type of deployment plan accommodates more complex mixes of products and solutions, hardware tiers, or other situations not handled by the standard plans. If one of these is required, please contact your SAS Customer Loyalty representative or SAS Technical Support.

SAS DEPLOYMENT WIZARD: STEP BY STEP THROUGH THE DEPLOYMENT PROCESS

Once the software depot is created and you have selected a deployment plan, the **SAS Deployment Wizard** handles the deployment process and shows you the progress, step by step. These steps make the software operable and enable your SAS users to bring up their client applications. Most of the steps are automatic and do not require user intervention. As each item is completed, a green check mark appears. If errors occur, the items are flagged. At some point after the initial deployment, if your company licenses additional software, you can re-launch the SAS Deployment Wizard and stipulate that you want to deploy only the new software.

In order for the software to be activated, SAS must be able to verify which products have been licensed. The license key is delivered in your SAS Software Depot where the SAS Deployment Wizard can find it.

The LICENSE KEY: THE KEY TO THE KINGDOM

The **license key** (also known as the **license file**, **setinit,** or SAS installation data file--**SID**) indicates which software you have licensed and ensures that the SAS Deployment Wizard installs only the software that you legally can use. A copy of the license key can be found in the SAS Software Depot, and, for renewal software, also comes as an attachment with your SOE. It is generally copied to the sid_files directory in your software installation directory for safe keeping but it can be stored anywhere as long as you remember where it is. You will be asked for its location during the installation process. In future years, when you renew your software, you will receive updated license keys that extend the use of the software for the next period of time (usually a year), and it is recommended that you store

this new file in the same directory as you stored the previous one(s). The update process also asks for the location of the license key.

SAS® MANAGEMENT CONSOLE: THE CONTROL PANEL FOR SAS OPERATIONS

At this point, your SAS software should be deployed. Congratulations! You are almost ready to let the SAS users at your company start making programming and modeling magic. An important step remains – to give those SAS users access to the software, data sources, and functionality they need. These tasks all involve setting up the metadata to control the day-to-day activities of the users and are handled through **SAS Management Console**. In some SAS shops, these tasks are performed by the SAS Administrator, a crucial member of the team who serves as liaison between the SAS users and the IT organization. The SAS Administrator can be a member of the IT organization or a SAS programmer/member of the business community, but in either case, he or she is well versed in the roles and responsibilities of both groups and can "translate" the requirements of each into language the other can understand.

SAS Management Console creates and sets permissions for users and groups; manages authorization; creates and registers libraries; manages services; manages users and roles; manages channels, subscribers, and message queues; and, in short, handles all of the security and availability of systems and data for the SAS users. Setting up the metadata takes some time, practice, and advance planning to correctly determine who has access to what, but is a critical part of a smoothly running SAS shop.

SAS® ENVIRONMENT MANAGER: A WINDOW INTO SAS ENVIRONMENT PERFORMANCE

New with SAS® 9.4 is **SAS Environment Manager**. Environment Manager presents information about SAS processes and resource use in formats that are familiar to IT. This web-based administration application collects and charts data on metrics for monitored resources, providing a comprehensive view of resource health and application usage. Like SAS Management Console, SAS Environment Manager is envisioned as a way for the SAS Administrator or IT organization to keep tabs on the operation of SAS and ensure that everything is running smoothly. Throughout the life cycle of SAS 9.4, additional functionality is planned for addition to SAS Environment Manager.

SAS® MIGRATION UTILITY: WHEN YOU MOVE TO A NEW PLATFORM OR RELEASE

The process of moving or upgrading a metadata-based environment to a new release of SAS is made easier by the **SAS Migration Utility**. This utility reads the source deployment and creates a package of content that the SAS Deployment Wizard recognizes and lays down when the new version of SAS is deployed, eliminating the need to "start from scratch" when setting up the new metadata layer. The package created by the SAS Migration Utility includes metadata content such as libraries, reports, jobs, information maps, and so on; configurations stored in metadata such as servers, users, and groups; key server configuration files that keep track of permissions; and more. You can also use the SAS Migration Utility to move the entire deployment to a new location or to new machines.

Before using the SAS Migration Utility to create the migration package, you can use it to create a migration analysis report. Indicating which components are eligible for migration and which ones are not, this report can help you tailor the migration process appropriately. For example, you might choose to "promote" (move piecemeal) some parts of your metadata or even re-create it if it is out of date—or you can continue using the SAS Migration Utility to move the complete deployment to a new place or a new version. In addition, running the SAS Migration Utility (both in analyze and package mode) produces a log that will provide even more information about potential issues, saving time and avoiding headaches later on.

When you are ready to create your migration package, be sure to run the copy of the SAS Migration Utility that is delivered in your SAS Software Depot, or download an appropriate one based on your source system. There are planning steps and additional considerations before performing a migration, so use the extensive documentation available at the support website. Needless to say, a best practice is to back up your metadata before running the Migration Utility in package mode.

WHERE CAN YOU GET HELP?

There's certainly a lot to learn to get a SAS environment configured and to keep it running smoothly. Luckily, there is a great deal of support available.

- Consider engaging SAS Professional Services to provide installation and migration services. SAS consultants have performed thousands of installations and are extremely familiar with all the stages of the process and all the potential stumbling blocks that can be encountered along the way. The services are conducted with the expectation that personnel from your company will be involved so they can see how it's done and understand the mechanics so they can do it themselves the next time. Professional Services are especially helpful when the installation is complex, including multiple solutions across a multi-tiered environment. To contact SAS Professional Services, reach out to your SAS Sales representative.
- Take SAS Training classes to learn about SAS administration of metadata-based deployments.
- Contact SAS Technical Support with questions or if you need help with your installation of SAS, have questions about working with SAS Management Console, or any other aspect of using SAS.
- Take advantage of extensive online documentation on all of the topics discussed in this paper. A good place to start is at the Install Center.
- Look for relevant presentations at SAS Global Forum or in the conference proceedings. Here are several examples:
  - Margaret Crevar, *Top 10 Resources Every SAS Administrator Should Know About*. [When they are available, see the *Proceedings of the SAS Global Forum 2014 Conference*.]
  - Brian Andrews, Gary Burchett, Donna Bennett, The Lowdown on the Download: What's Really in My SAS Software Depot and How Did it Get There?
- Numerous SAS Blogs address the roles and responsibilities of IT organizations supporting SAS shops, including SAS Voices.
- Communities exist to provide a forum for discussion and problem solving. One of particular interest is the SAS Deployment community.
- Contact your Customer Loyalty representative, who can arrange knowledge transfers, lunch and learn sessions, SAS Days, and other activities to help you get the most from your SAS software.

CONCLUSION

The processes for administering a SAS deployment introduce some new terms and concepts. As with any new language, once you have a basic understanding of the terms, it is much easier to explore more complex processes and concepts. The more you are familiar with the concepts and understand how they work and why they're important, the better you will be able to support your company's decision to use SAS.

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