Deployment for SAS® 9.2 and Beyond

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ABSTRACT

As the SAS architecture has grown to serve the complex and distributed challenges of enterprise-wide deployments, the tools used to plan, deliver, install, and configure SAS software have needed to grow in lockstep. The 9.2 release of the SAS Enterprise Intelligence Platform delivers an accompanying revolution in the way SAS software is deployed. The paper will summarize advancements such as electronic software download, customized orders, silent installations, streamlined dialog boxes, deployment capture/replay, and SAS Software Depot management.

Looking further into the future, SAS Deployment R&D already has several innovative efforts underway. The paper will close by describing initiatives in the areas of open source standards and tools, update services, and Information Technology Infrastructure Library (ITIL) framework adoption.

INTRODUCTION

Over the last few decades, SAS has written deployment tools to ease the installation and configuration of our software. Because they were developed over this extended period, these tools frequently display unique user interfaces, prompting methodologies, and operational flow. The 9.2 release of SAS software provides a major leap forward in the deployment experience, bringing a set of sometimes disjointed tools under a common framework, and providing the user with a cohesive and much more automated end-to-end installation experience.

To highlight the SAS 9.2 enhancements, a chronological approach can be helpful. The paper describes a typical customer deployment timeline, involving planning, pre-installation activities, product delivery, installation, configuration, and maintenance.

PLANNING

By far, planning is the most important and perhaps time-consuming step of the deployment chronology. In this step, you answer questions such as the following:

- What products will be installed on what systems?
- Am I migrating from a 9.1.3 configuration and content, or starting from scratch with release 9.2?
- What third-party products will need to be preinstalled in support of SAS software?

SAS MIGRATION UTILITY

Users wishing to migrate metadata-based environments from release 9.1.3 to release 9.2 will use the SAS Migration Utility to analyze, and eventually bundle up 9.1.3 configuration and content to be fed into the 9.2 deployment tools. The SAS Migration Utility is a simple command-line tool that runs on Windows, UNIX, and z/OS. It will be available on the SAS software downloads Web site, as well as provided with all orders including a SAS Metadata Server.

The following shows the syntax of a basic SAS Migration Utility command:
```
smu -processmode Analyze
    -sasproductdir <product installation directory>
    -configpath <configuration directory>
    -host <metadata hostname>
    -port <metadata port number>
    -user <metadata administrator account>
    -password <metadata administrator password>
```

The above command would be run on all servers in the 9.1.3 environment that host SAS Metadata Servers, SAS Application Servers, and Web Application Servers/Containers into which SAS applications have been deployed. Basically, this means running it on any 9.1.3 host that has a configuration directory.

The utility will check all installed products to make sure they are at the minimum levels that support migration, and produce a report showing the extent to which all detected products and supporting data can be migrated. The report

is in XML format, and will clearly point out anything that must be manually migrated, if desired. An example would be a metadata-registered data library that lives outside of the configuration directory.

PLAN FILE

9.2 deployments will use a completely rearchitected plan file structure. As a result, existing 9.1.3 plan files, either customized or standard, should be consulted only for reference purposes. They cannot be used directly to feed 9.2 deployment tools. The 9.2 deployment tools will include a new set of standard plan files which is a superset of the standard plans offered by the SAS Software Navigator in release 9.1.3.

Users of customized plan files will need to engage SAS in the same way they did for release 9.1.3 in order to get a valid 9.2 plan file for their specific environment. Starting with release 9.2, we will provide support for generating plan files in support of future releases by importing existing 9.2 or later plan files. Topology diagrams will accompany customized plan files received from SAS. These diagrams will clearly show which products are to be installed and configured on which systems in a user's environment.

CUSTOMIZED PRE-INSTALLATION CHECKLIST

Users of customized plan files will also receive customized pre-installation checklists. These outline the steps a user needs to take prior to installing their specific 9.2 SAS software. Such steps include the following:

- setting up operating system accounts
- setting up operating system groups
- installing prerequisite third-party software

Unlike current 9.1.3 preinstallation checklists delivered with the plan file, the customized lists will break down the specific steps needed for each system in the environment. The steps will be tailored to the operating system, and the product mix to be installed on each machine. For example, only Windows users and groups will be listed for Windows machines. Web Application Server instructions will appear only where SAS middle tier applications like Web Report Studio are being deployed.

DELIVERY

The second step in the deployment chronology is delivery—getting the bits to your site. For release 9.2 and beyond, SAS is promoting Electronic Software Delivery as the primary means of doing so. Additional enhancements to the Software Order E-mail and order contents will make receiving SAS software more efficient, and less prone to complications.

SOFTWARE ORDER E-MAIL

As with 9.1.3 orders, SAS Contracts will send a Software Order E-mail (SOE) summarizing all licensed products. Unlike with 9.1.3 orders, "complex" orders which include separate SAS Foundation servers on disparate operating systems will be consolidated into a single order, and thus a single SOE. If these servers are to be sent to different geographic sites, each site will receive a copy of the entire consolidated order. At deployment, a user will choose the associated system from the consolidated order in order to choose the appropriate product mix.

Another key difference between release 9.1.3 and 9.2 is that the SOE will no longer contain an attached SAS Installation Data (SID) license file. SAS will deliver the SID along with the product binaries, rather than sending it separately. Hence, anyone with access to the originally delivered software will have access to the associated license file.

ELECTRONIC SOFTWARE DELIVERY

As part of SAS's initiative to be a more environmentally-conscious company, it will be promoting the electronic delivery of all ordered software. Such Electronic Software Delivery (ESD) also provides nearly instant gratification for customers placing orders. They can now receive SAS software within hours rather than days.

The SOE will direct a user to download the SAS Download Manager client to a local Windows, UNIX, or OpenVMS on HP Integrity system. This client communicates with download servers around the globe which provide quick access to the latest SAS software. Users simply invoke the Download Manager, enter the order number and security key from the SOE, and provide a destination directory. The Download Manager then retrieves the associated products, placing them in a SAS Software Depot at the chosen destination.

CUSTOMIZED ORDERS

Another key difference from the 9.1.3 delivery experience is in the order content. Orders will be customized to contain only those products requested by the user—no more and no less. This makes for shorter download times, smaller software depots, and fewer pieces of media (if desired).

INSTALLATION AND CONFIGURATION

An enormous amount of research and development has gone into optimizing the installation and configuration of all SAS 9.2 products. A new front-end wizard, the SAS Deployment Wizard, is used to drive all product installations, and automates a significant amount of configuration that was previously left as manual steps in 9.1.3 deployments.

SAS MIGRATION UTILITY

Users wishing to migrate 9.1.3 deployments will need to run the SAS Migration Utility in Execute mode. This bundles up all configuration and content that can be migrated into a single Migration Package. The Migration Utility syntax is very similar to the aforementioned Analyze mode:

```
smu –processmode Execute
     -outputdir <cross-machine output directory>
     -sasproductdir <product installation directory>
     -configpath <configuration directory>
     -host <metadata hostname>
     -port <metadata port number>
     -user <metadata administrator account>
     -password <metadata administrator password>
```

A single option has been added to specify the output directory destination of the Migration Package. This directory should be a network filespace location accessible by all 9.1.3 SAS server machines. The user runs the smu command on all these machines, and the Migration Utility will create, on each machine, subdirectories that contain pertinent metadata and data stored in 9.1.3 configuration and installation directories.

SAS DEPLOYMENT WIZARD

The SAS Deployment Wizard replaces the SAS 9.1.3 Software Navigator, and is the single entry point for all SAS software deployments in release 9.2 and beyond. It will run on Windows, UNIX, z/OS, and OpenVMS on HP Integrity systems. The Deployment Wizard resides as a single executable at the root of a SAS Software Depot (for example, setup.exe on Windows and setup.sh on UNIX). Users run it on each machine to host SAS software.

The Deployment Wizard asks all questions related to the installation and configuration of selected products prior to performing any deployment tasks. In this way, no questions are repeated on a given machine. If a deployment spans multiple machines, it stores responses to certain questions in the associated metadata repository in order to share them with Deployment Wizard runs on other machines.

Deployment Wizard activities are split into installation and depot management. Installation consists of typical product installations and automated configuration. Depot management entails annotating, deleting, duplicating, and subsetting software depots. Users familiar with Windows SAS Administrator Wizard installations will find this functionality under depot management. The depot management tools also include a facility to create media (CDs or DVDs) if the host computer is equipped with a writable disk drive.

The Deployment Wizard's installation functionality enables separate installation and configuration steps. All installed software is directed to a selected SASHOME directory, and registered using a new deployment registry. Once installed, software can be configured multiple times, directing each configuration to a different directory in which metadata and other product specific configuration is stored. Each configuration is deployed using a separate run of the Deployment Wizard.

During installation mode, the Deployment Wizard asks for basic information like order, license file, SASHOME, and configuration directory. Note that by default, the Deployment Wizard will seed these prompts with information from its containing depot, as well as previous runs on that machine saved as part of the user's login profile. If the user previously ran the Migration Utility, they specify the associated migration package location. The Deployment Wizard will then input this package, and seed (or hide) additional prompts based on its contents.

There are three modes of prompting within the Deployment Wizard—Express, Typical, and Custom. The Express mode presents the minimum set of prompts required to create a working deployment. Typical mode adds several prompts which will be of general interest to most installers; for example port numbers over which SAS servers will communicate. Custom mode presents a comprehensive list of all customizable parameters, and is intended for advanced or complicated deployments that require a unique level of customization.

A point of emphasis with 9.2 deployment is in an increased level of automation. Many of the steps which appear in the 9.1.3 instructions.html document, like server startup, are now completely automated. Web applications like SAS Web Report Studio can even be optionally auto-deployed into the user's Web Application Server. The 9.2 instructions.html file primarily contains validation steps (for example, testing server connections), rather than setup steps.

A significant enhancement offered by the Deployment Wizard is capture/replay capability. This is chiefly focused at large-scale deployments that involve numerous, identical client installations. Users can now run the Deployment Wizard in capture mode, which will automatically save all responses during the run to an external file. The Deployment Wizard can then be run in a silent replay mode on a different machine, using this response file as input. IT administrators can thus easily distribute commands to be run on client machines, either manually by end users, or automatically through third-party provisioning software like SMS and Tivoli.

MAINTENANCE
As in the past, SAS will continue to release minor product enhancements and bug fixes via maintenance vehicles. For release 9.2 and beyond, these will come in the form of hot fixes and maintenance packs. These will be delivered electronically through SAS Web sites, as well as through a new software update service.

HOT FIXES
Hot fixes will exist as they do today. SAS Technical Support will provide these bug fixes on their support site, and users can download and install fixes applicable to their product mix. 9.2 hot fix deployment tools will download hotfixes to a depot, and install them from there. The tools will also enable the rollback of any installed hot fixes. New orders will automatically contain all hot fixes deemed critical for the associated product mix. These hot fixes will auto-deploy as part of the initial installation using the SAS Deployment Wizard.

MAINTENANCE PACKS
Similar to their service pack predecessors, maintenance packs will be comprised of an accumulation of key product bug fixes. In addition, they will contain certain added functionality, notably new localizations. Maintenance packs will be validated by SAS Research and Development to avoid regressions, and verify that associated fixes operate in concert. Maintenance packs are intended to be released every four to six months.

Maintenance deployment tools will also download the requested maintenance to a depot, and install it from there. They will also support associated reconfigurations—for example, the repackaging and deployment of SAS Web applications. As with hot fixes, the latest maintenance pack will be included with all new orders, and will be applied automatically by the initial installation using the SAS Deployment Wizard.

UPDATE SERVICE
New with release 9.2 is a software update service. Initially, the service will support maintenance on SAS Foundation products, in addition to standalone clients. In other words, it will support products that do not require configuration by the SAS Deployment Wizard. Users can set up the update service to automatically notify them of maintenance updates available for their installed products. It will also optionally download and/or install these updates, if so selected by the user. SAS is exploring RSS feeds or other subscription-based methods to notify users of maintenance involving configuration.

CONCLUSION
With the planning, migration, delivery, installation, configuration, and maintenance tools offered by the 9.2 release of SAS software, users will see a major leap forward in optimizing their deployment experiences. Advancements in electronic software delivery, customized orders, automated configuration and migration, capture/replay, streamlined dialog flow, and a maintenance update service provide for quicker, easier, and more reliable deployments.

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