

Provisioning Systems and Other Ways to Share the Wealth of SAS® Across a Network

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ABSTRACT

This paper will outline SAS® deployment tools' integration with popular third-party provisioning systems such as Microsoft System Management Server, IBM Tivoli Provisioning Manager, and HP OpenView. We will cover how our installation tools work in concert with these systems during initial deployment as well as maintenance, and why these systems are important to many of our customers. We will also discuss the SAS strategy for integration with existing provisioning software versus providing our own. Finally, we will cover the current image distribution functionality incorporated in SAS Administrator Wizard deployments.

INTRODUCTION

As desktop systems emerged as cheaper alternatives to UNIX workstations and mainframes, the management of those desktop systems posed significant challenges. The distributed nature of the systems made deployment of software resources and life cycle management of those resources, such as license management, particularly problematic. To solve the deployment and management difficulties, software known as provisioning systems were born. Prior to version 9.2, SAS only loosely supported integration with provisioning systems. SAS provided silent install capabilities in its PC product lines focusing primarily on SAS Foundation and Enterprise Guide. With version 9.2, however, SAS is more proactively supporting the use of provisioning systems. The silent install capabilities of SAS Foundation and Enterprise Guide have been moved into the new 9.2 install user interface, the SAS Deployment Wizard, which allows for silent deployment of not only SAS Foundation and Enterprise Guide, but other SAS offerings such as Enterprise Miner, Enterprise BI Server, and Enterprise Data Integration. The silent capabilities of the SAS Deployment Wizard extend beyond just installing bits, it also allows for silent scripting of configuration tasks that were formerly done as manual post-install steps via the instructions.html file generated by the SAS Configuration Wizard.

The SAS Approach

As provisioning systems emerged to manage software resources, the software lacked a clear set of standard interfaces and protocols. The net result is that there are now several dozen "major" provisioning system vendors and each is built to a large degree on proprietary software. See Appendix A for a list of vendors' systems for which SAS intends to document integration.

In an effort to meet the needs of all of its customers, SAS has taken the approach to integrate with each system versus building packages specific to each system. The engineering and testing costs of building for each provisioning system would result in a much lower quality product and less focus on enhancing SAS deployment tools with additional capabilities. Each of these systems supports the ability to run install programs silently as well as other management tools. To that end, SAS' approach for 9.2 is to enhance its silent installation capabilities and document the approach for deploying SAS through the major vendors' systems using SAS' silent deployment technology.

As a side note, the recognition of a lack of standards in the provisioning space has been acknowledged by the software industry. As of the authoring of this paper, a new Technical Committee in the OASIS standards body has been formed to create a set of standards around provisioning software. SAS is observing the evolution of these standards and will potentially adapt its deployment and management tools in the future to adhere to well defined standards for integration with provisioning systems.

About this document

The purpose of this document is to describe how to distribute SAS 9.2 software via Microsoft System Management Server (SMS) 2003 Service Pack 2 provisioning software.

For the purposes of this document, SAS will demonstrate installing SAS Foundation 9.2. SAS assumes the reader has a basic working knowledge of Microsoft SMS 2003 Service Pack 2.

This document is organized by the 7 steps needed to deploy SAS software via SMS. These steps are quite common for deploying any software via SMS, however this paper is meant only to document how to deploy SAS software via SMS.

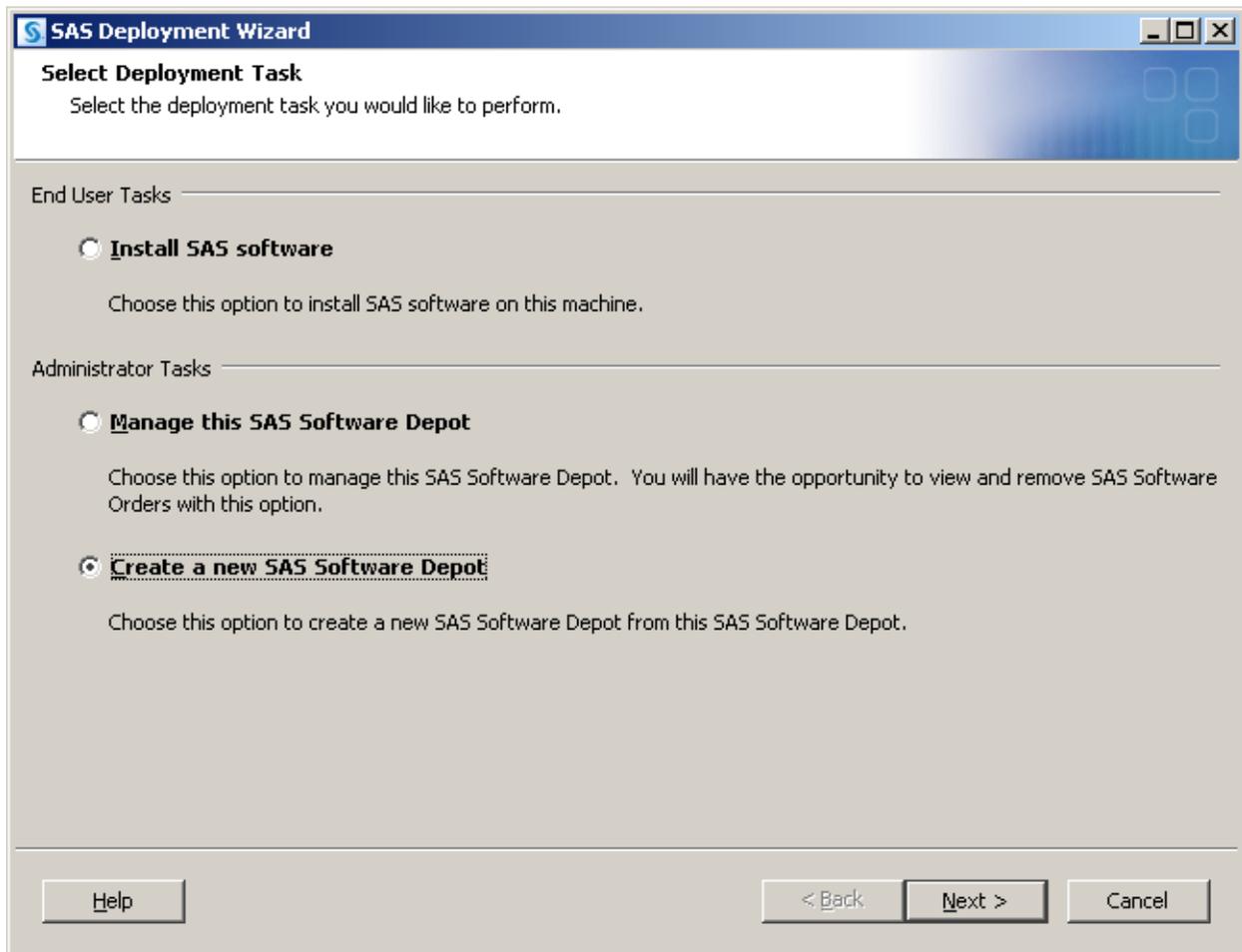
The required steps to deploy SAS software via SMS are as follows:

1. Create a SAS Software Depot (SSD)
2. Make the SAS Software Depot accessible by the SMS site server
3. Record a quiet response file using the SAS Deployment Wizard
4. Create an SMS package for the SAS software
5. Define the program to execute to perform the deployment
6. Advertise the SAS package
7. Query/review status from the install operation

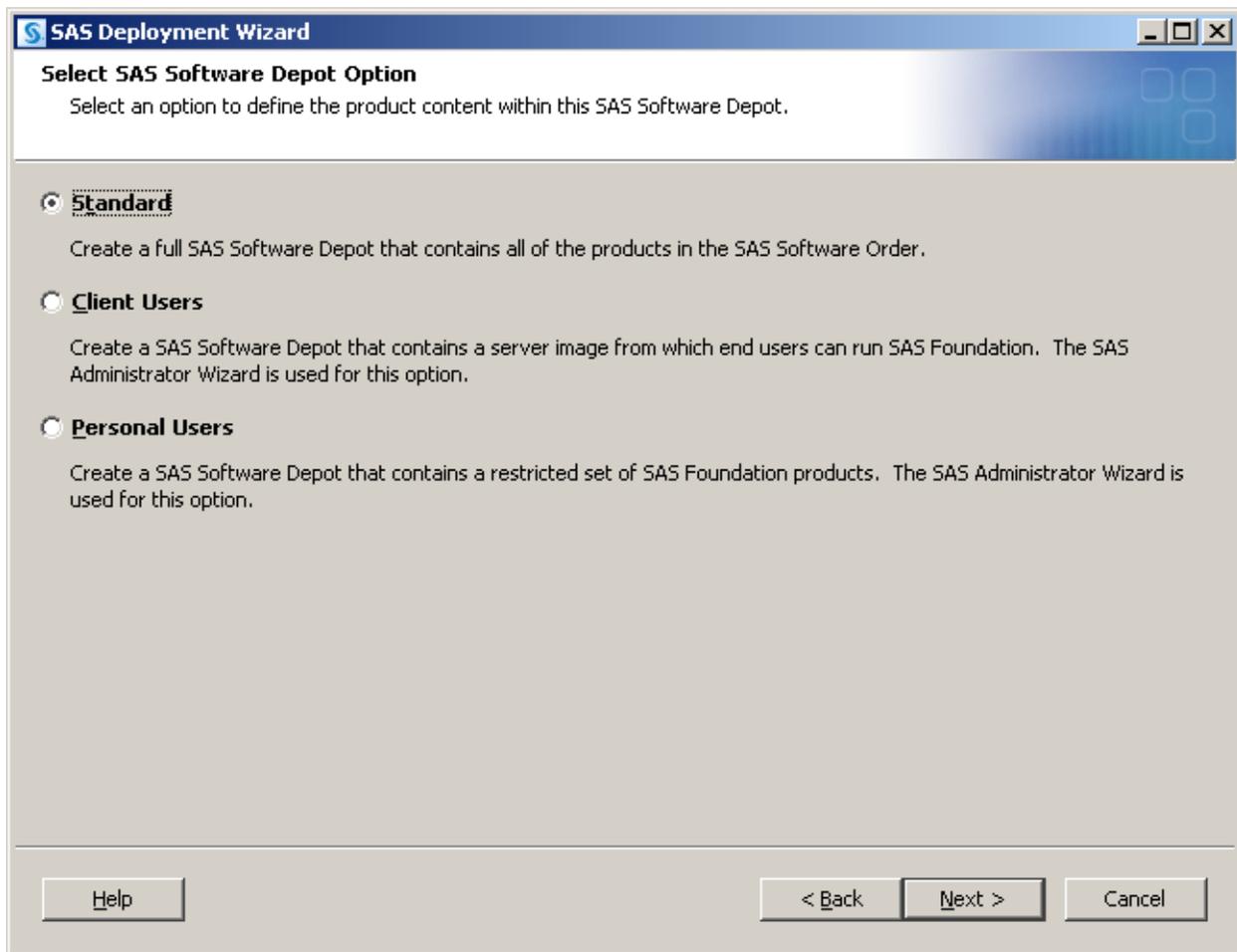
Step 1: Create a SAS Software Depot

From the installation media received from SAS (DVD or Electronic Software Download), navigate to the root folder of the media and invoke the setup.exe program. When prompted for language, choose the desired language of the install experience from the dropdown menu and select "okay." The "Select Deployment Task" dialog will be presented.

On the "Select Deployment Task" dialog, choose "Create a new SAS Software Depot" and select "Next." A dialog will then be presented allowing the user to choose the type of SAS Software Depot to create.



After selecting to "Create a new SAS Software Depot" the "Select SAS Software Depot Option" dialog will be presented which allows for the type of depot to be specified. SAS recommends that the "Standard" depot option be selected for most cases. Users accustomed to the SAS Administrator's Wizard functionality can create those types of SAS Software Depots by specifying the "Client Users" or "Personal Users" option when constructing the depot. This will be covered in more detail later in this document.



Following this dialog, a destination dialog will be presented for the directory location to which the SAS Software Depot will be copied. SAS recommends that a network accessible file system be chosen for this location. After choosing the destination location of the SAS Software Depot, the copy process will take place and once complete the depot will be constructed.

Note to Electronic Software Download users: if a download has been performed directly to network accessible file space, the create SAS Software Depot step of these instructions may be skipped. The Electronic Software Download of SAS copies the system directly into a SAS Software Depot format.

Step 2: Make the SAS Software Depot accessible by the SMS site server

Like all software installation packages, SMS requires the SAS Software Depot, which contains the source files to install and setup routines, to be accessible to the SMS site server.

Depending on where the SAS Software Depot is installed (as noted in step 1) will determine how the SAS Software Depot should be made accessible to the SMS site server.

The simplest process is to share the location of the SAS software Depot and make sure the SMS site server has permissions to this share.

Note that depending if the SMS site has standard or advanced security will determine how to set the permissions to the share. Please consult SMS 2003 SP2 documentation for information regarding standard and advanced security.

If a network accessible file server was not used in step 1 and the SAS Software Depot must be copied to the SMS server, SAS recommends following the process outlined in step 1 to create a SAS Software Depot locally on the SMS server. Note that doing this will double the footprint of the SAS Software Depot which is why SAS recommends a network file share in step 1.

Step 3: Record a quiet response file

For SMS to deploy SAS software silently, a silent response file is required. To create the silent response file run the SAS Deployment Wizard from the SAS Software Depot. To do this, run

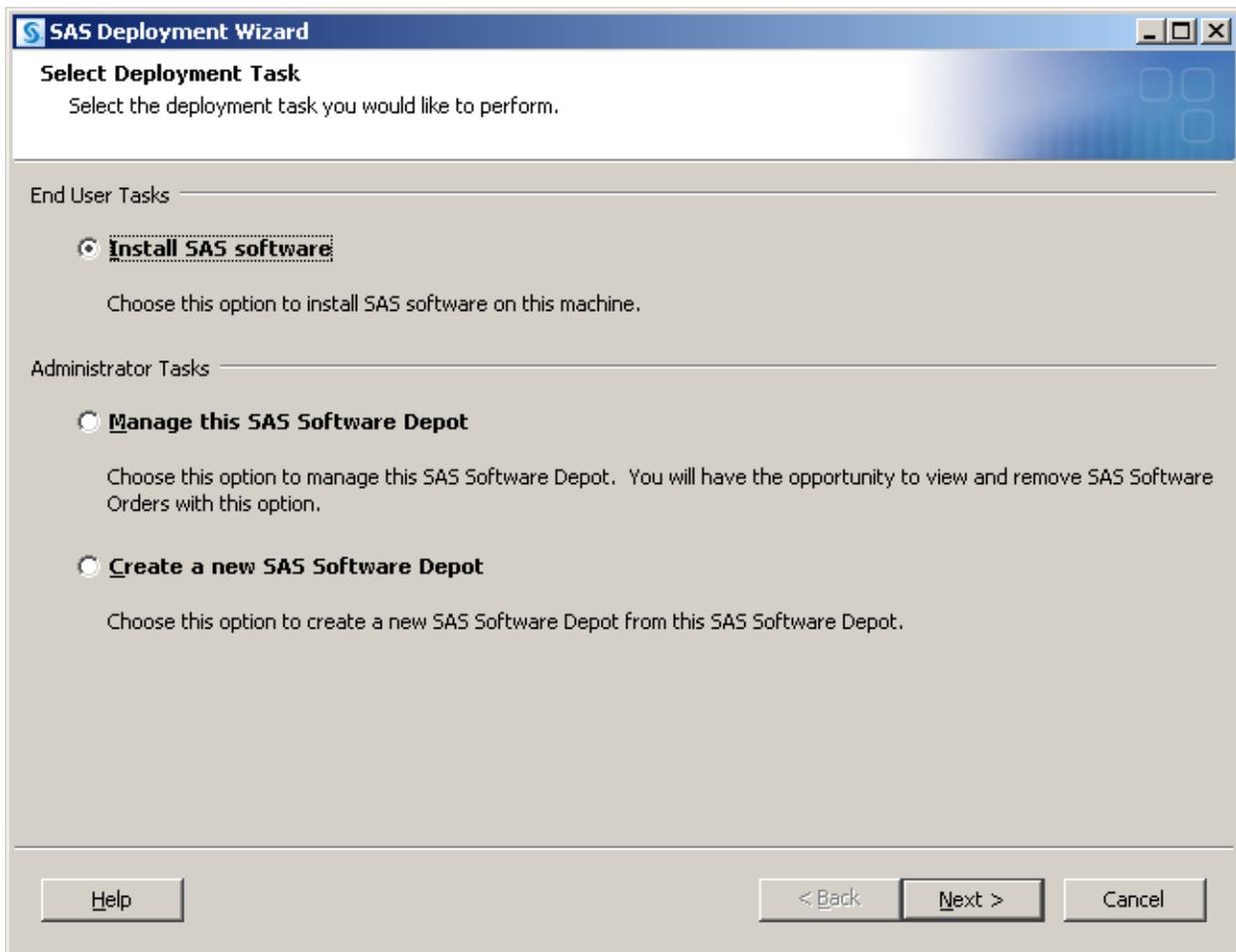
```
setup.exe -record -responsefile <SAS_Software_Depot_Location>\response.properties
```

If the `-responsefile` argument is not specified, a default file called `sdwresponse.properties` will be created in the user's home directory. This file can be later copied to the SAS Software Depot and renamed if necessary.

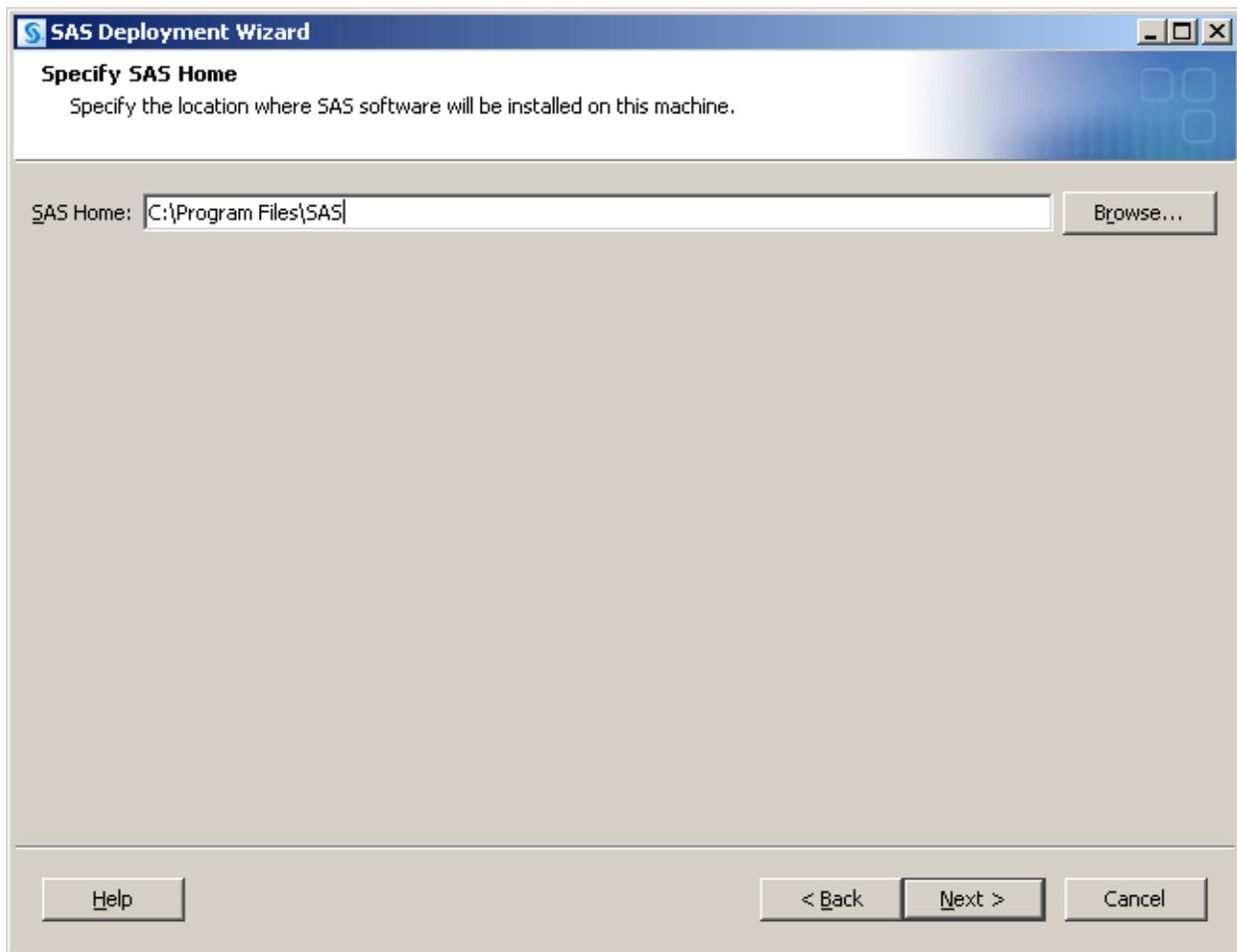
Note that while it may appear SAS software will be installed instead of recording a response file, rest assured if `-record` was used as an option to the SAS Deployment Wizard only a response file will be created. You can confirm this with the Deployment Summary dialog which indicates "no changes will be made to your system in record mode."

After invoking the SAS Deployment Wizard using the command noted above, the following are screen captures of the dialog flow that will be presented. For illustrative purposes, this document outlines the default selections. Should non-default selections be chosen, these will be honored by the record mode capabilities of the SAS Deployment Wizard.

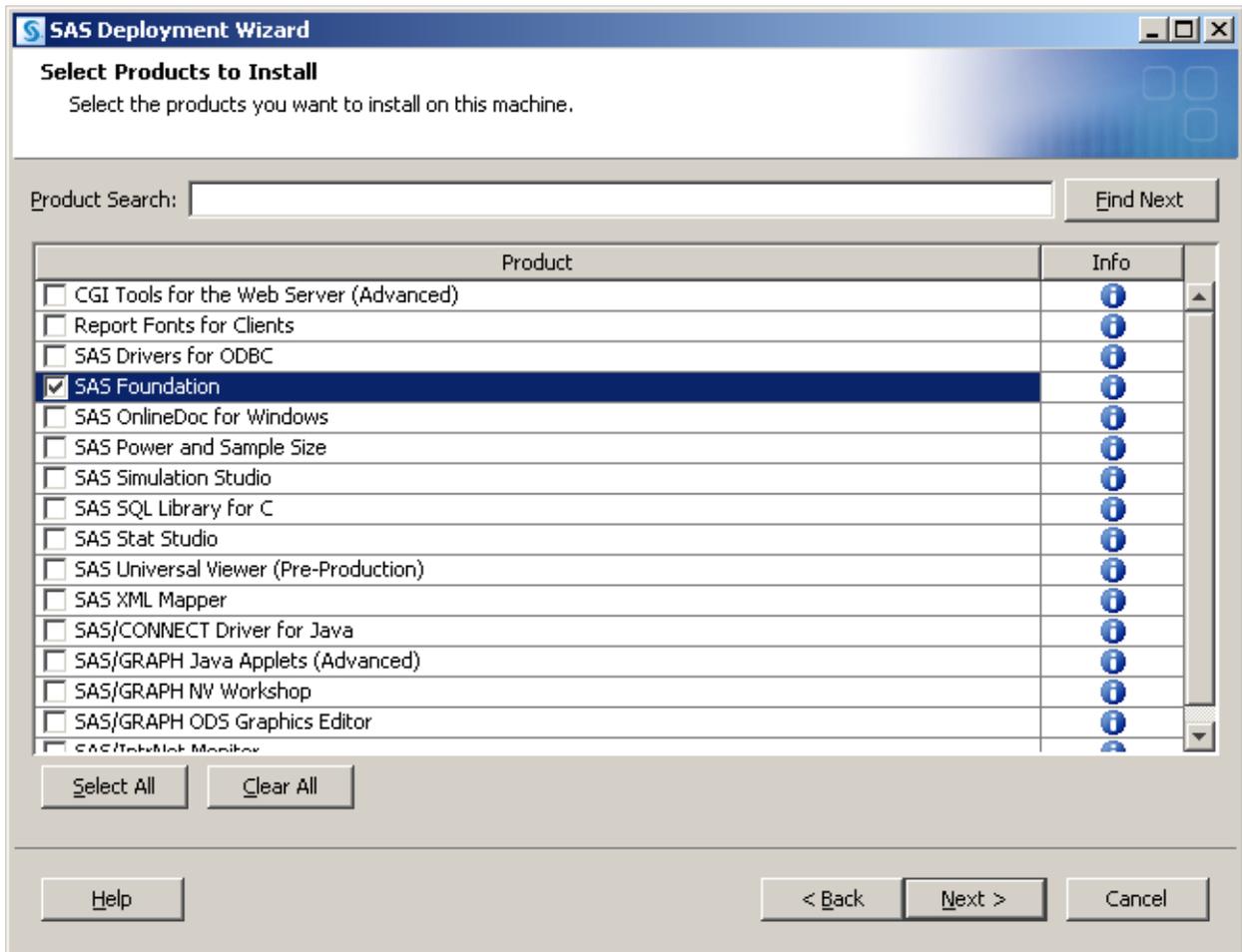
After choosing the desired language for the installation experience, choose "Okay." The following dialog will be presented. Choose "Install SAS Software" on this dialog.



Next the prompt for "Specify SAS Home" (the destination directory) will be presented. SAS recommends using the default program files path on Windows, however, an alternative path may be chosen and is fully supported by SAS deployment tools.

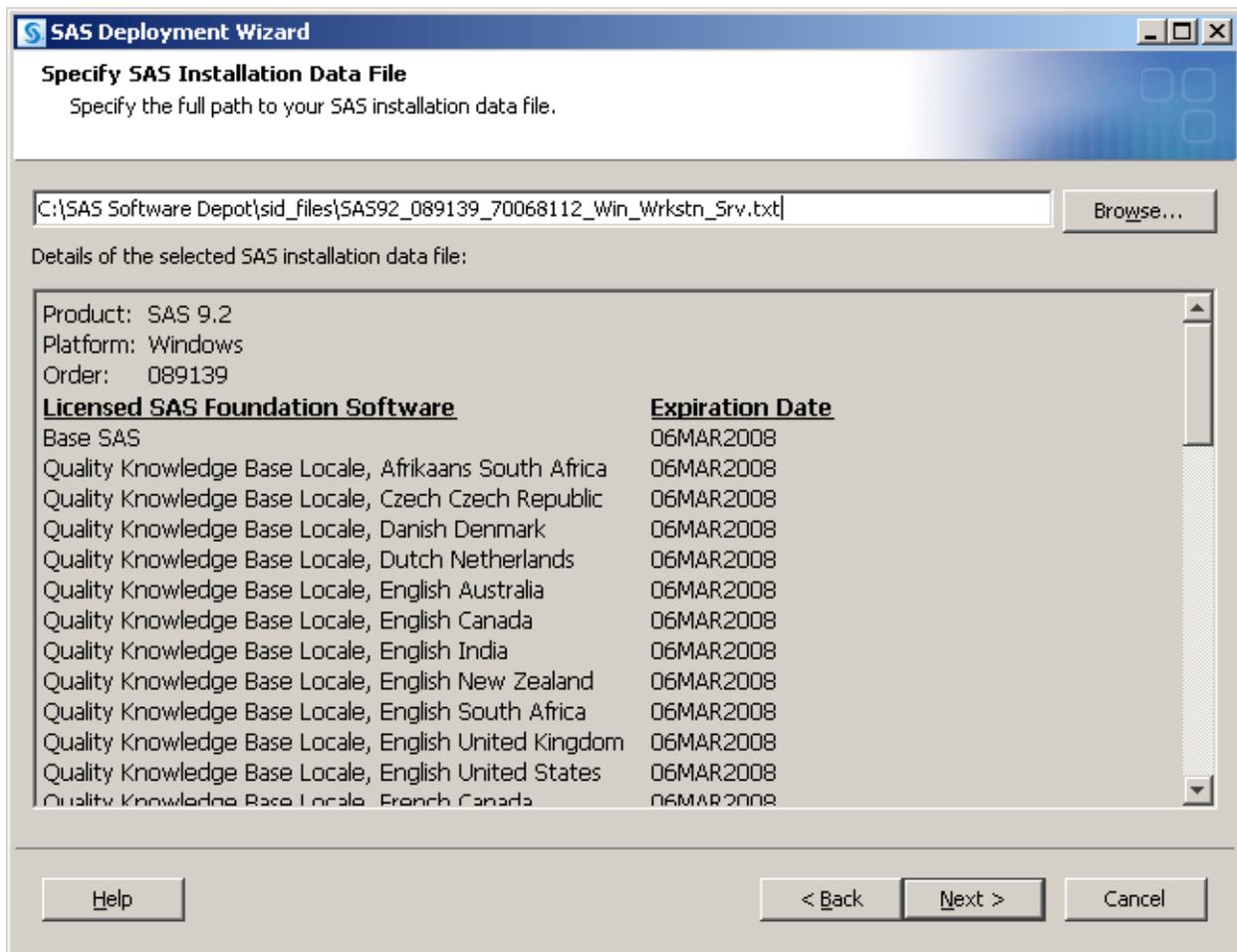


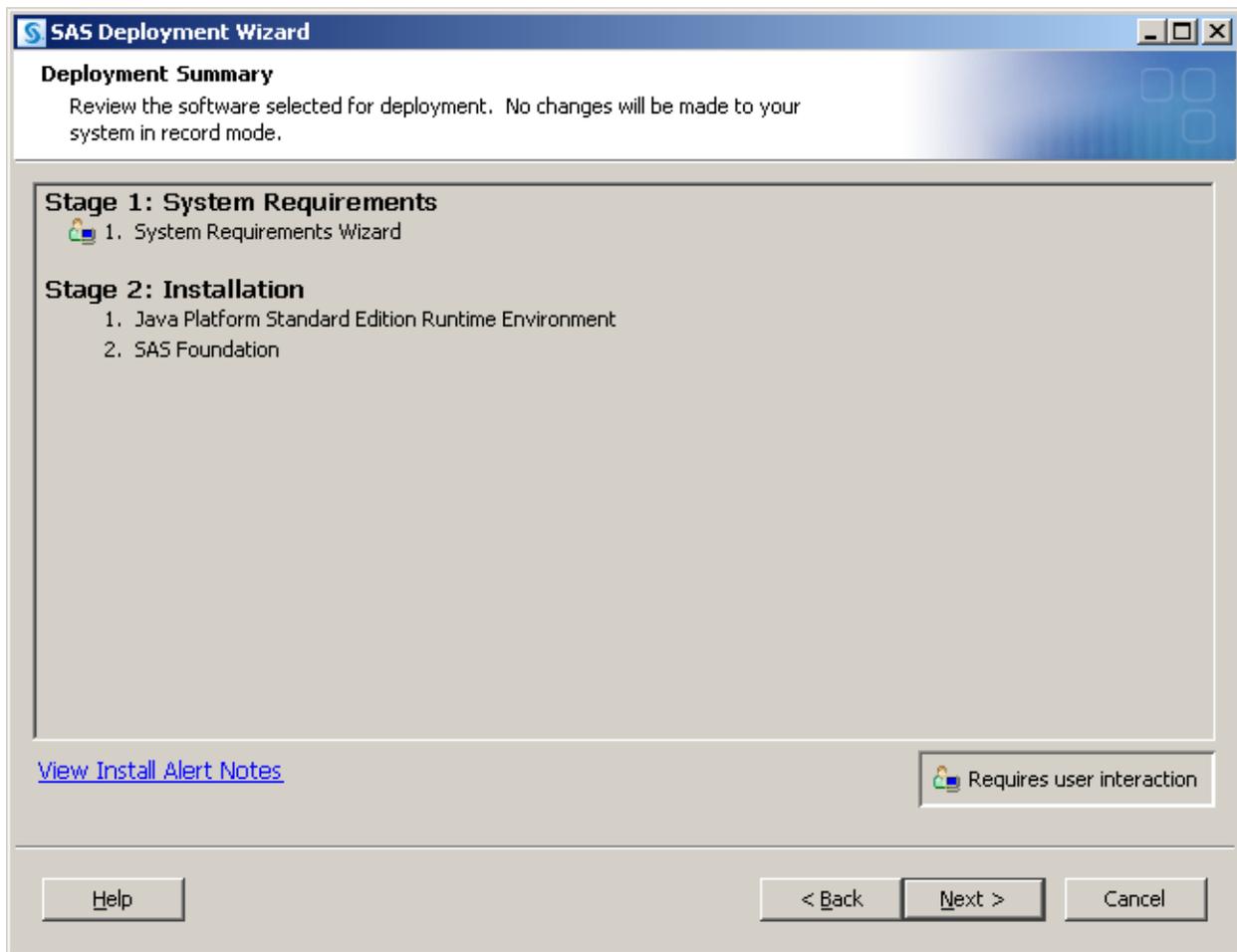
After specifying the SAS Home directory, the “Select Products to Install” dialog will be presented which allows for the selection of SAS software to be installed. For illustrative purposes, this document will install SAS Foundation software only. The selection of additional SAS software to be installed is allowed and is fully supported for silent installation via SMS.



After selecting the SAS software to be installed, the “Specify SAS installation Data File” dialog is displayed. The default SAS Installation Data file should be sufficient in almost all cases. But this dialog is where selection of a different SAS Installation Data file can be made.

After selecting the SAS Installation Data file, a confirmation window that specifies the software included in the SAS Installation Data file is displayed. After reviewing the content for accuracy, select “Next” to be presented with the “Deployment Summary” dialog. Review the deployment summary dialog and choose “Next” to create the response file.

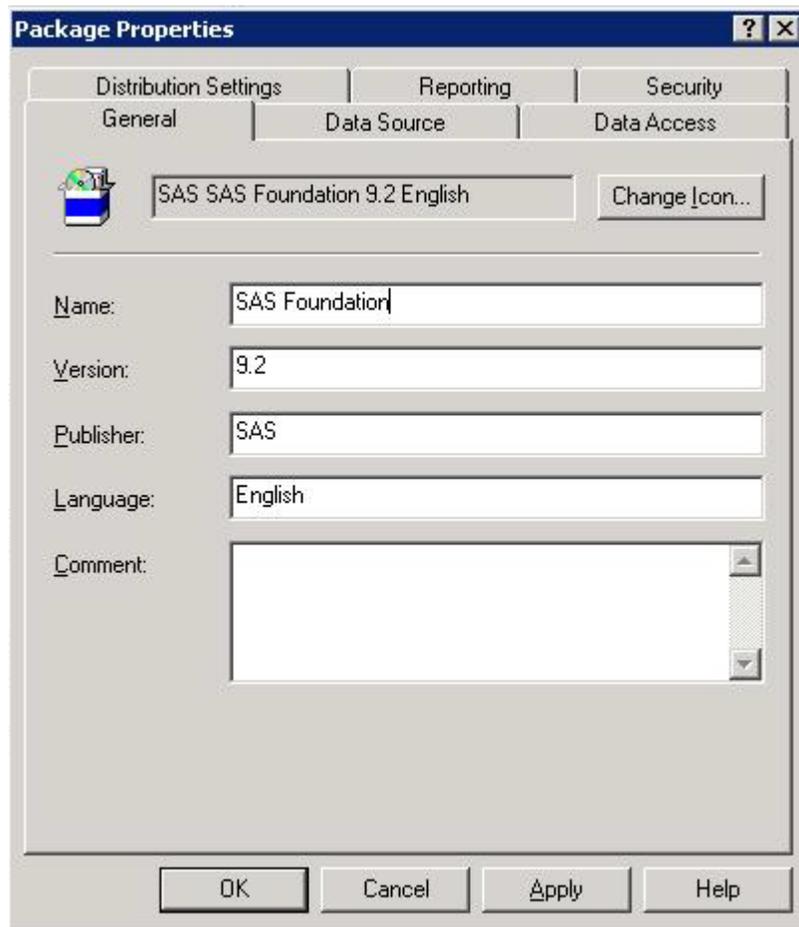




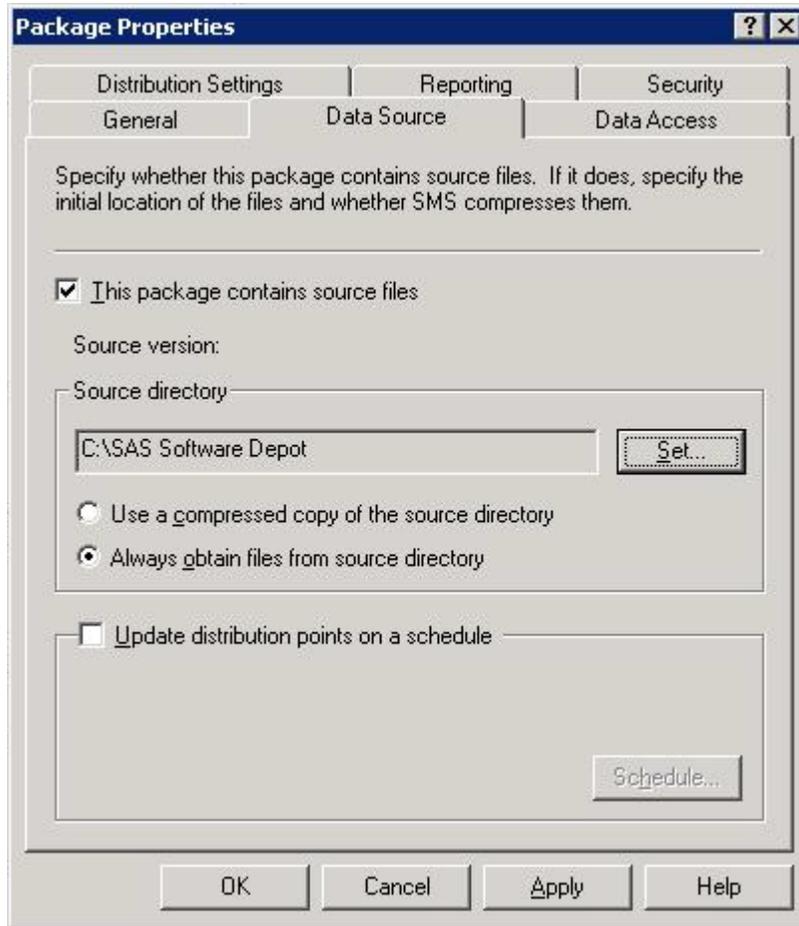
Step 4: Create an SMS package for the SAS software

This section outlines the process to create a new SMS package via the SMS Administrator Console for SAS software. Below are screenshots of the typical steps needed for creating an SMS package for deploying SAS software.

1. Enter general information about the package properties via the “General” properties tab. Note that these do not need to match the values in the status.mif file (explained in more detail later) as they will be defined later on the Reporting tab for package properties.



- For the "Data Source" tab, specify the location of the SAS Software Depot.

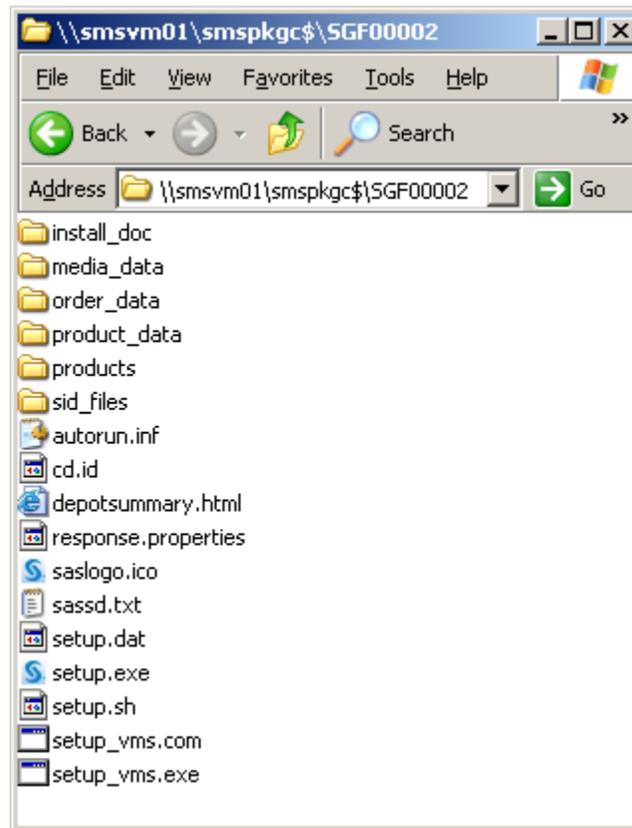


3. On the "Reporting" tab be sure to select "Use these fields for status MIF matching." Enter the MIF information exactly as described here. Note that the sasstaus.mif file is saved in the user's temporary directory.

- MIF filename: sasstatus.mif
- Name: The SAS System
- Version: 9.2
- Publisher: SAS

The image shows a screenshot of the "Package Properties" dialog box, specifically the "Reporting" tab. The dialog box has a title bar with a question mark and a close button. Below the title bar are four tabs: "General", "Data Source", "Data Access", and "Reporting". The "Reporting" tab is selected. The main area of the dialog contains the following text: "Specify how SMS determines whether Management Information Format (MIF) files generated by clients apply to this package." Below this text are two radio buttons. The first radio button is labeled "Use package properties for status MIF matching" and is unselected. The second radio button is labeled "Use these fields for status MIF matching:" and is selected. Below the radio buttons are four text input fields. The first field is labeled "MIF file name:" and contains the text "sasstatus.mif". The second field is labeled "Name:" and contains the text "The SAS System". The third field is labeled "Version:" and contains the text "9.2". The fourth field is labeled "Publisher:" and contains the text "SAS". At the bottom of the dialog box are four buttons: "OK", "Cancel", "Apply", and "Help".

4. Assign a distribution point for the SAS software package and verify success by looking for the following files and directories in the distribution point.



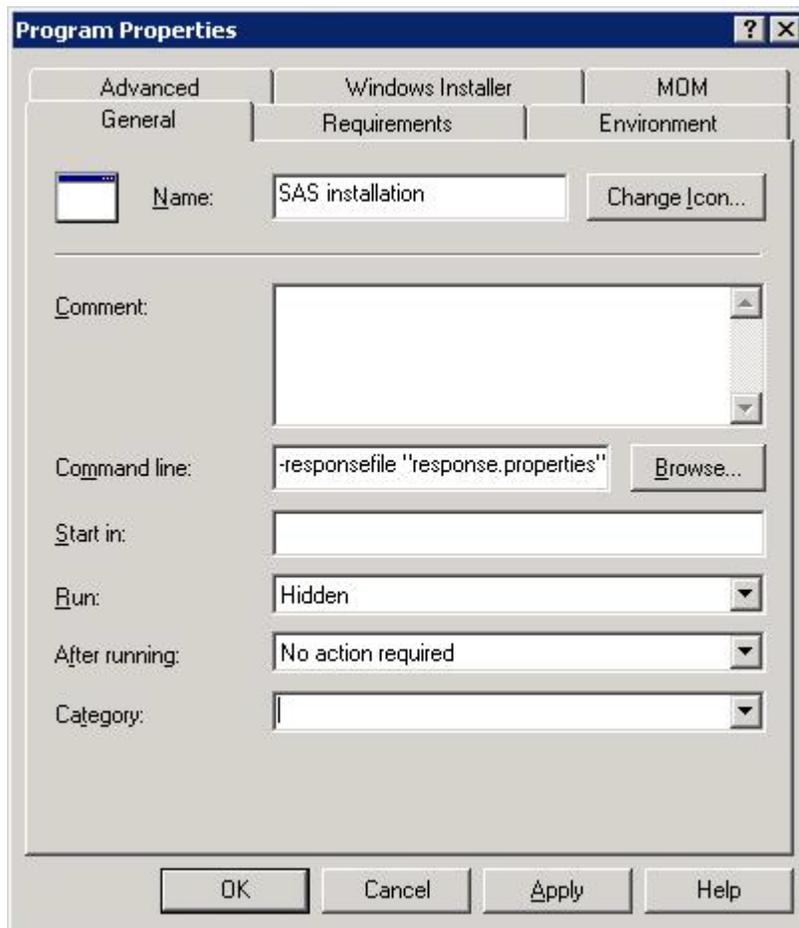
Step 5: Define the SAS Deployment Wizard program to execute on the client

SMS requires a program to be defined for each package to specify how the package is executed. In this case the program will be the SAS Deployment Wizard, setup.exe. The action this program will perform is installing SAS software. Below are the screen shots containing the program properties needed to install SAS. For the “General” program properties tab the “Command line” syntax is below.

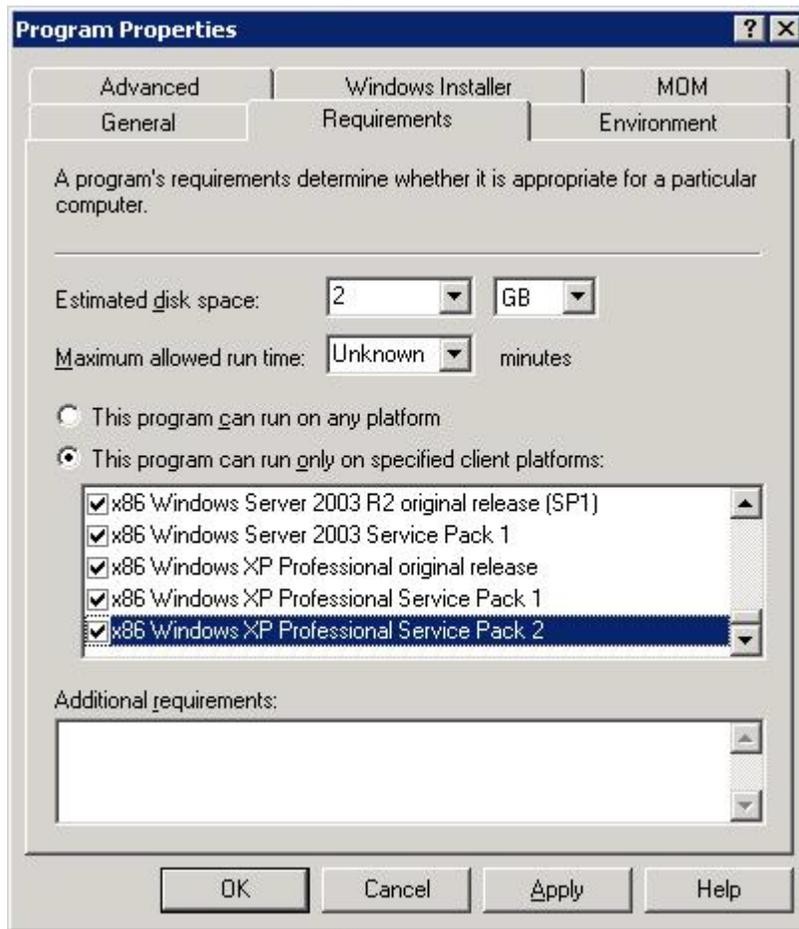
```
setup.exe -quiet -responsefile <response file>
```

The response file is the file specified earlier in **Step 3: Record a quiet response file**. In this example, the command line is

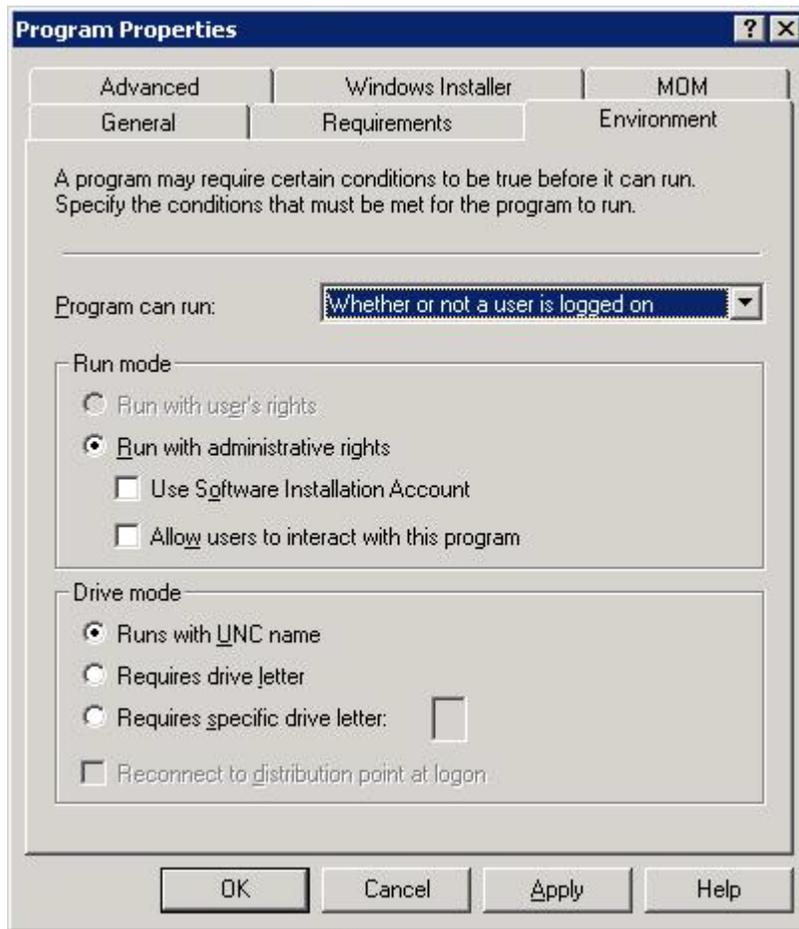
```
setup.exe -quiet -responsefile "response.properties"
```



For the “Requirements” program properties tab, select values based on the system requirements of the SAS software to install, select the estimated disk space and platforms accordingly. If disk space is not known, leave it set to unknown.



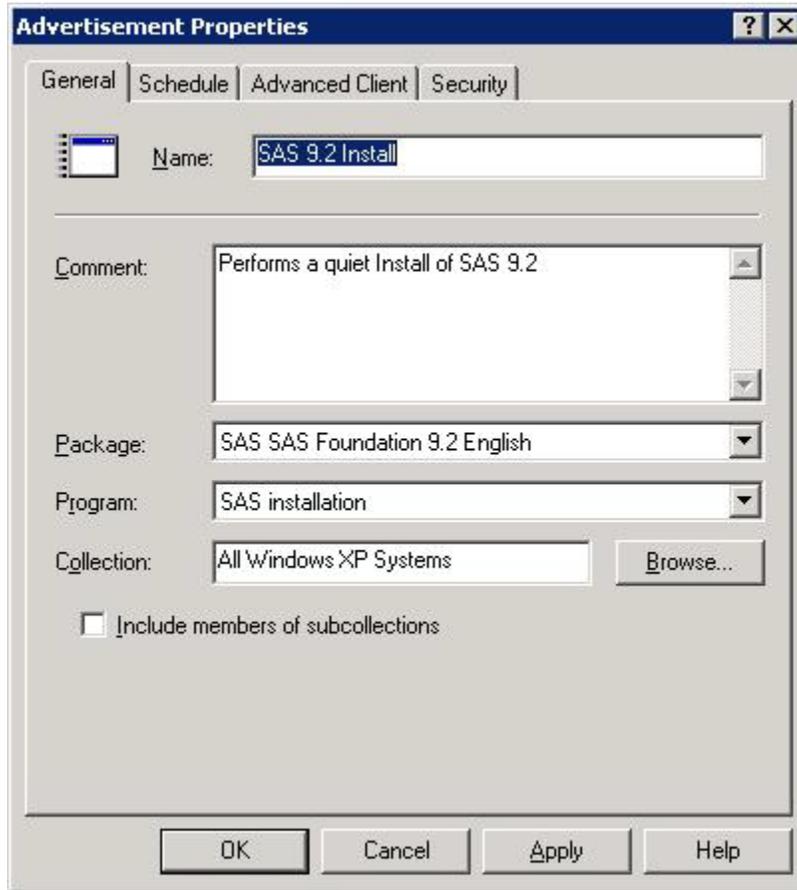
For the “Environment” program properties tab, make sure “Run with administrative rights” is selected. The SAS software requires administrative rights to install. Note, however, that administrative rights are not required to run SAS software after it has been installed.



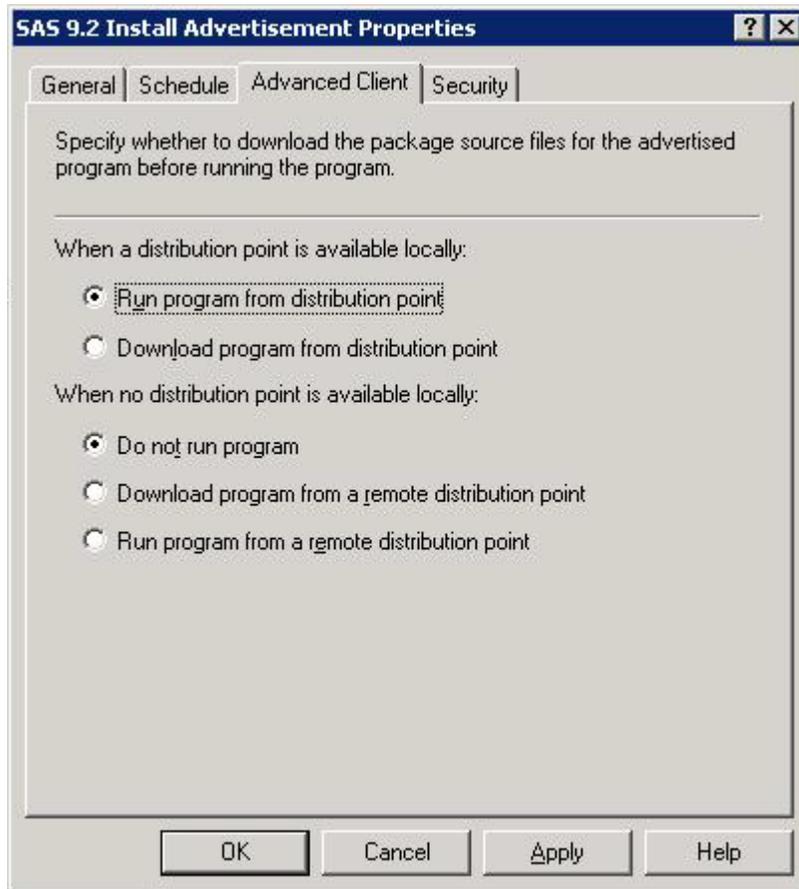
Step 6: Advertise the SAS package

To install SAS software, the SAS software package must be advertised to the client or end point machine.

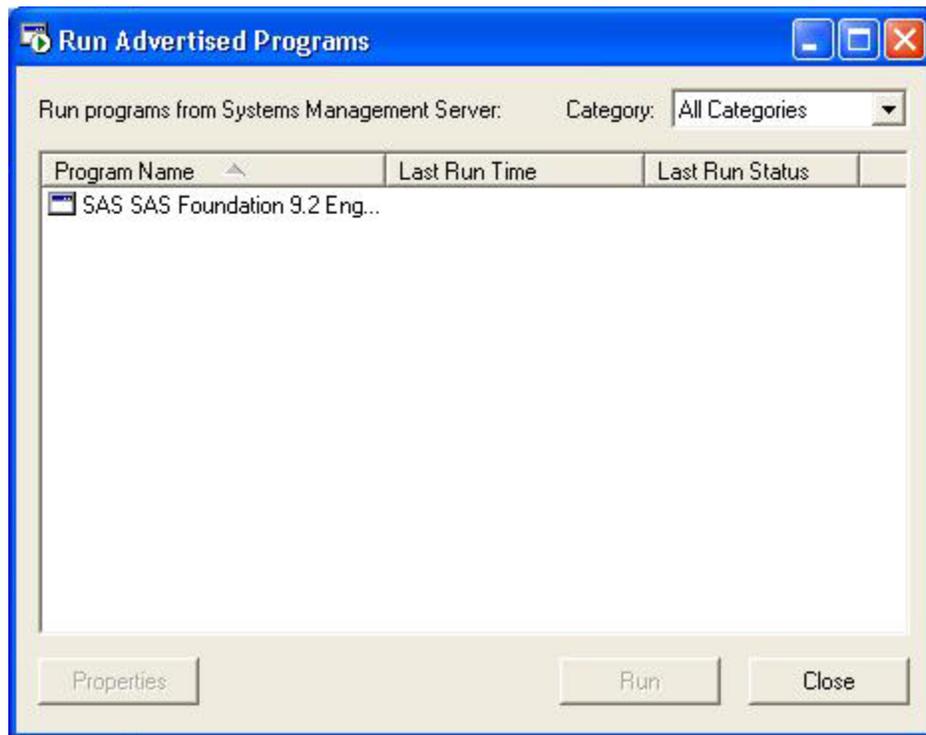
For the “General” advertisement properties tab, select the appropriate SAS software package and the program to run within that package. In this example the program to run is called the SAS installation. However, it is the SAS Deployment Wizard that is getting invoked.



For the “Advanced Client” advertisement properties tab, the recommendation is to select to run the program from a distribution point where possible due to the size of the SAS Software Depot. Downloading from a remote distribution point is not recommended given the bandwidth cost associated with performing the download on each end point. “Download program from a remote distribution point” is only recommended for light weight SAS software packages such as viewers or graph editors. This might also be a useful setting for deploying hot fixes or other incremental types of maintenance.



After advertisement of the package has been performed, the SAS software package will potentially be displayed in the Run Advertised Programs dialog as seen below. This is based on the advertisement properties settings. The advertisement could be configured to run the package program as soon as possible once the client has received the advertisement.



Step 7: Query/review status from the install operation

Status from the install operation is provided in several different methods. Those methods are:

- 1) Status return code from the setup.exe (SAS Deployment Wizard)
- 2) Management information format file (.mif)
- 3) SAS Deployment Wizard log file
- 4) SAS Foundation install log file

The first two methods are most immediate for use by the SMS Administrator Console to determine quickly the overall health of the SAS install.

1) Status return code

The status return code from the SAS Deployment Wizard will be one of two values.

- 1) 0 which indicates a successful install of SAS software
- 2) -1 which indicates SAS software failed to install

2) Management information format file

The .mif file for a SAS software install is sasstatus.mif and is stored under the temp directory of the user deploying the software.

Below is an example sasstatus.mif as created by the SAS software installation.

```
START COMPONENT
NAME = "WORKSTATION"
  START GROUP
    NAME = "ComponentID"
    ID = 1
    CLASS = "DMTF|ComponentID|1.0"
    START ATTRIBUTE
      NAME = "Manufacturer"
      ID = 1
      ACCESS = READ-ONLY
      STORAGE = SPECIFIC
      TYPE = STRING(64)
      VALUE = "SAS"
    END ATTRIBUTE
    START ATTRIBUTE
      NAME = "Product"
      ID = 2
      ACCESS = READ-ONLY
      STORAGE = SPECIFIC
      TYPE = STRING(64)
      VALUE = "The SAS System"
    END ATTRIBUTE
    START ATTRIBUTE
      NAME = "Version"
      ID = 3
      ACCESS = READ-ONLY
      STORAGE = SPECIFIC
      TYPE = STRING(64)
      VALUE = "9.2"
    END ATTRIBUTE
    START ATTRIBUTE
      NAME = "Locale"
      ID = 4
      ACCESS = READ-ONLY
      STORAGE = SPECIFIC
      TYPE = STRING(16)
      VALUE = "ENU"
    END ATTRIBUTE
    START ATTRIBUTE
      NAME = "Serial Number"
      ID = 5
      ACCESS = READ-ONLY
      STORAGE = SPECIFIC
      TYPE = STRING(64)
      VALUE = ""
    END ATTRIBUTE
    START ATTRIBUTE
      NAME = "Installation"
      ID = 6
      ACCESS = READ-ONLY
      STORAGE = SPECIFIC
      TYPE = STRING(64)
      VALUE = "DateTime"
    END ATTRIBUTE
  END GROUP
  START GROUP
    NAME = "InstallStatus"
    ID = 2
    CLASS = "MICROSOFT|JOBSTATUS|1.0"
    START ATTRIBUTE
      NAME = "Status"
      ID = 1
      ACCESS = READ-ONLY
      STORAGE = SPECIFIC
```

```

        TYPE = STRING(32)
        VALUE = "Success"
    END ATTRIBUTE
    START ATTRIBUTE
        NAME = "Description"
        ID = 2
        ACCESS = READ-ONLY
        STORAGE = SPECIFIC
        TYPE = STRING(128)
        VALUE = "Installation Successful"
    END ATTRIBUTE
END GROUP
END COMPONENT

```

If the status return code is -1 or the sasstatus.mif file indicates a status value of failure then consult the second two methods of install status to diagnose the cause of the failed install.

3) SAS Deployment Wizard log file

The SAS Deployment Wizard log file is named SDW.log and is typically located in C:\Documents and Settings\\Local Settings\Application Data\SAS\SAS Deployment Wizard of the user installing the SAS package. This log file contains the error code and a general description of the error.

4) SAS Foundation install log

The SAS Foundation install log does not have a fixed name but follows the following format sasinstall_<date>_<time>.log (for example, sasinstall_01212008_104105.log)

This file is typically located in C:\Program Files\SAS\InstallMisc\InstallLogs\9.2 and will contain more detail about the failure.

After confirming a successful SMS deployment via one of the four methods outlined above or a combination of the four methods, SAS has been deployed and is usable on the target machine(s). Customizations of the deployed SAS image can then be made by user preferences and those settings are stored in the local SAS image created by following these steps.

SAS Administrator Wizard

For those familiar with the SAS Administrator Wizard functionality available in SAS Foundation for previous releases, that functionality is still available via the new 9.2 SAS Deployment Wizard. The images created for installation by the SAS Administrator's Wizard can be integrated with provisioning systems. The steps to do this are very similar to the steps outlined above with only a few minor differences. Those minor differences will be highlighted. The steps to deploy a SAS Administrator's Wizard image via SMS are

1. Create a SAS Software Depot (SSD)
2. Make the SAS Software Depot accessible by the SMS site server
3. Record a quiet response file using the SAS Deployment Wizard
4. Create an SMS package for the SAS software
5. Define the program to execute to perform the deployment
6. Advertise the SAS package
7. Query/review status from the install operation

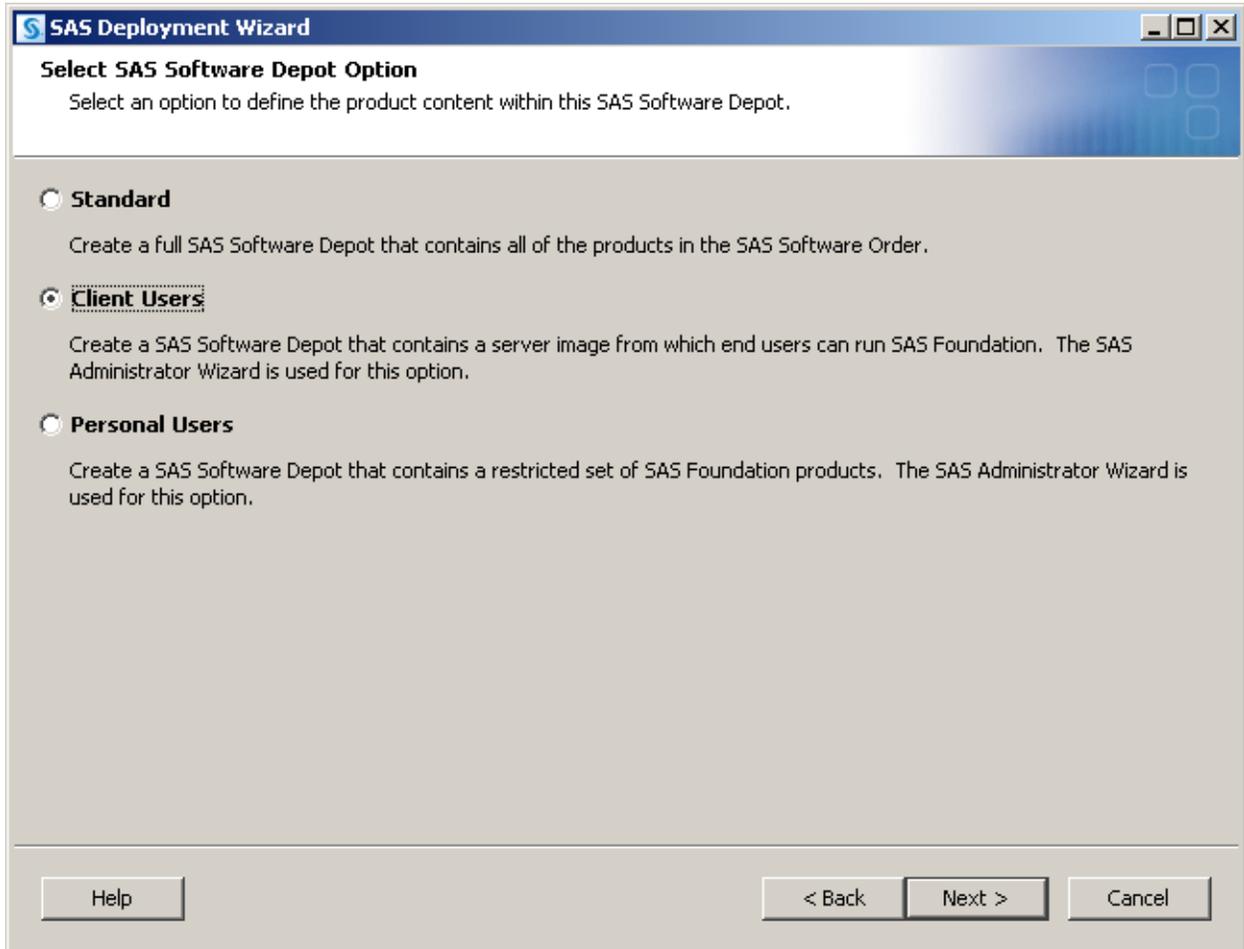
Step 1: Create a SAS Software Depot

The main difference between a SAS Deployment Wizard created SAS Software Depot and a SAS Administrator's Wizard created SAS Software Depot is in the *type* of depot created.

To create a network image of SAS from which small footprint clients can run, choose “Client Users” from the “Select Software Depot Option” dialog.

To create a customized SAS Foundation image from which users can install a full footprint SAS Foundation image, choose “Personal Users” from the “Select SAS Software Depot Option” dialog.

Note that a user that has created a SAS Software Depot by using Electronic Download services from SAS MUST perform either the “Client Users” step or “Personal Users” step if a SAS Administrator’s Wizard image is desired. Electronic Software Download of SAS does NOT create SAS Administrator Wizard format SAS Software Depots.



Step 2: Make the SAS Software Depot accessible by the SMS site server

These instructions are identical to the instructions earlier in this document.

Step 3: Record a quiet response file

After creating the SAS Administrator’s Wizard images, a response file distinct from the response file referred to heretofore must be created. To do this, navigate to the root of the SAS Administrator’s Wizard image that has been created and invoke the setup.exe file at the root directory.

The command to execute is as follows

```
setup.exe -record -quietfile=<path>\quiet.ini
```

This will create a response file that can then be played back using the following command

```
setup.exe -silent -quietfile=<path>\quiet.ini
```

Step 4: Create an SMS package for the SAS software

These instructions are identical to the instructions earlier in this document.

Step 5: Define the SAS Install Wizard program to execute on the client

The SAS Administrator's Wizard image does not include the SAS Deployment Wizard. Instead, it includes the SAS Install Wizard used in earlier releases of SAS. This is provided for compatibility purposes and will likely be deprecated in a future SAS release. The instructions in step 5 are identical to those noted earlier for the SAS Deployment Wizard image, however, the difference in step 5 for the SAS Administrator's Wizard is that the SAS Deployment Wizard setup.exe is NOT the program to execute on the client machine. Instead, the setup.exe created at the root of the SAS Administrator's Wizard SAS Software Depot should be specified as the program to execute.

For the "General" program properties tab the "Command line" syntax is below.

```
setup.exe -silent -quietfile=<path>\quiet.ini
```

The response file is the file specified earlier in **Step 3: Record a quiet response file**.

Step 6: Advertise the SAS Package

These instructions are identical to the instructions earlier in this document.

Step 7: Query/review status from the install operation

Status from the install operation is provided in several different methods. Those methods are:

- 1) Status return code from the setup.exe (SAS Installation Wizard)
- 2) Management information format file (.mif)
- 3) SAS Foundation install log file

The first two methods are most immediate for use by the SMS Administrator Console to determine quickly the overall health of the SAS install.

1) Status return code

The status return code from the SAS Deployment Wizard will be one of two values.

- 1) 0 which indicates a successful install of SAS software
- 2) Any non-zero return code indicates SAS software failed to install

2) Management information format file

The .mif file for a SAS software install is sasstatus.mif and is stored under the temp directory of the user deploying the software.

Refer to the example sasstatus.mif provided earlier in this document for a detailed look at sasstatus.mif.

If the status return code is non-zero or the sasstatus.mif file indicates a status value of failure then consult the SAS Foundation install log file to diagnose the cause of the failed install.

4) SAS Foundation install log

The SAS Foundation install log does not have a fixed name but follows the following format sasinstall_<date>_<time>.log (for example, sasinstall_01212008_104105.log)

This file is typically located in C:\Program Files\SAS\InstallMisc\InstallLogs\9.2 and will contain more detail about the failure.

After confirming a successful SMS deployment via one of the four methods outlined above or a combination of the four methods, SAS has been deployed and is usable on the target machine(s). Customizations of the deployed SAS image can then be made by user preferences and those settings are stored in the local SAS image created by following these steps.

CONCLUSION

Management of distributed systems challenges nearly all software vendors. SAS recognizes this challenge and has taken steps toward easing the burden of managing SAS in a distributed environment with enhanced record and playback capabilities new in 9.2. This approach allows SAS to integrate with provisioning systems without typing SAS to particular provisioning system implementations. This approach allows our customers the utmost flexibility in deploying SAS through their provisioning infrastructure which will enable all SAS customers who use provisioning to more easily manage SAS deployments.

The examples provided in this paper are the first of many more to come. SAS recognizes the large presence of Microsoft Systems Management Server on the Windows desktop and as such chose it as the example for this paper. However, there are many other vendors with large market share in this space and in the near future SAS will be providing enhanced documentation for deploying SAS with those systems as well. And, as mentioned earlier, SAS

will continue to monitor the evolution of standards in the provisioning space in an effort to give our customers the best experience possible when deploying SAS through provisioning.

CONTACT INFORMATION

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

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