Technical Paper

Provisioning Systems and Other Ways to Share the Wealth of SAS

Table of Contents

Abstract **1**
Introduction **1**
System Requirements **1**
Deploying SAS Enterprise BI Server **6**
Step 1: Create a SAS Software Depot 7
Step 2: Record a response file using the SAS Deployment Wizard 10
Step 3: Create an SCCM package for the SAS software 11
Step 4: Distribute package content to SCCM distribution points 17
Step 5: Deploy the package 20
Step 6: Monitor the package deployment 28
Deploying SAS Enterprise Guide and the SAS Add-in for Microsoft Office **28**
Step 1: Make the setup programs accessible to the SCCM server 29
Step 2: Record response files 29
Step 3: Create SCCM Packages 29
Step 4: Distribute packages to SCCM distribution points 30
Step 5: Deploy the package 30
Step 6: Monitor the package deployment 31
Deploying Client Connection Profiles **31**
Conclusion **32**

Abstract

This paper outlines SAS deployment integration with Microsoft System Center Configuration Manager (SCCM). The SAS Enterprise BI Server, SAS Enterprise Guide and SAS Add-in for Microsoft Office products are featured in this paper. After reading this paper, the reader will understand the concepts regarding provisioning SAS using SCCM. In addition, the reader will be able to follow the documented procedures to deploy any SAS product using SCCM in their environment by applying the concepts covered. These concepts can also be applied to other provisioning systems that support the notion of creation and silent execution of software deployment packages.

Introduction

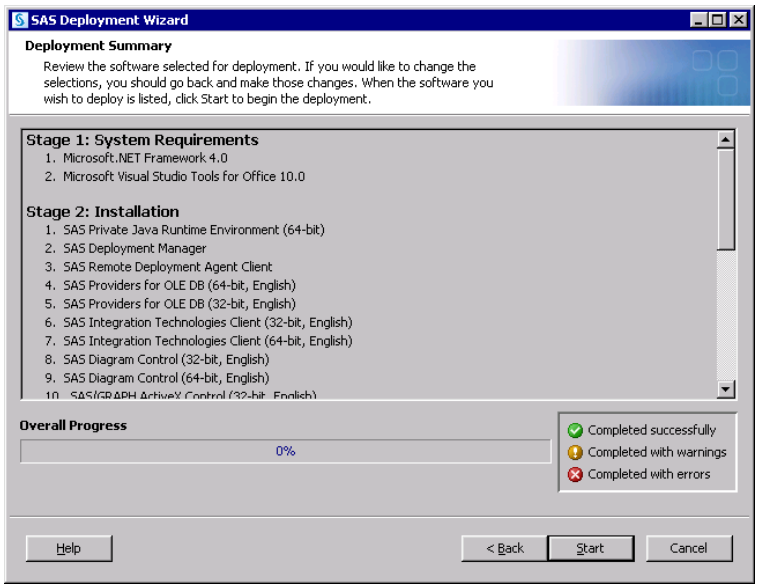
Managing software on large numbers of distributed machines (physical or virtual) poses deployment and maintenance challenges. Companies such as Microsoft have implemented systems management software to address those challenges. One of the more popular Windows system management tools is Microsoft System Center Configuration Manager (SCCM). Other vendors provide similar tools. In order to support a broad range of system management tools, SAS provides a common method for performing installations in silent/unattended mode.

Installing System Requirements

The SAS Deployment Wizard includes several Windows redistributables upon which various SAS products depend. For example, there are features in SAS Enterprise Guide which rely upon the .NET framework which is not part of some base Windows operating system distributions. In cases where needed system requirements are not already installed, the SAS Deployment Wizard will automatically detect the need and install the appropriate update. This automatic update can cause problems in a provisioning job because many of the system requirements require a system reboot in order to finalize the installation process.

SAS recommends separating system requirements into separate SCCM packages for deployment in order to avoid reboots in the middle of the main SAS deployment job. The system requirements packages should be deployed to client machines prior to deploying SAS.

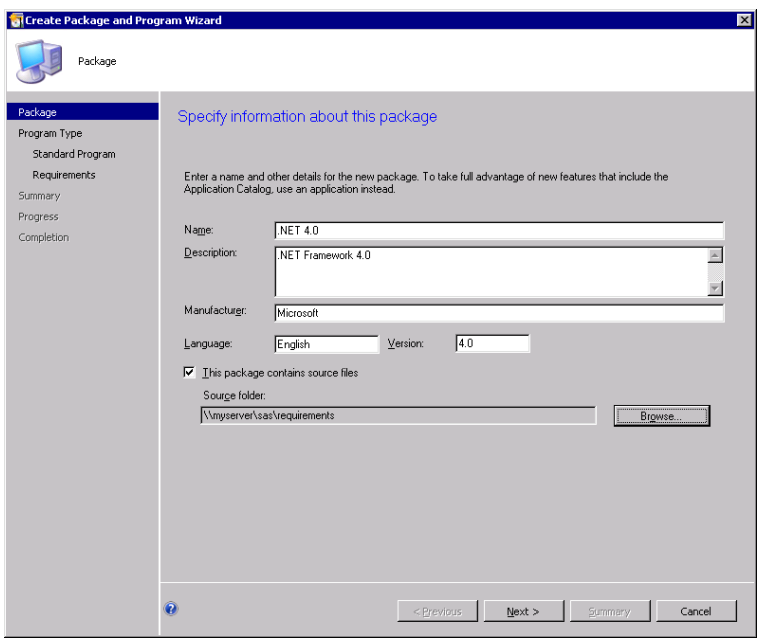
The system requirements for each product are documented in their respective system requirements documents. After determining the product mix to be deployed, system requirements can be read to determine the appropriate required software to deploy. Alternatively, the SAS Deployment Wizard can be run on a baseline Windows operating system to determine system requirements to be installed. If there are missing requirements, they will be listed in a **Stage 1: System Requirements** section in the summary panel. The following is an example showing the SAS Deployment Wizard detecting that Microsoft .NET Framework 4.0 and Microsoft Visual Studio Tools for Office 10.0 are not installed.



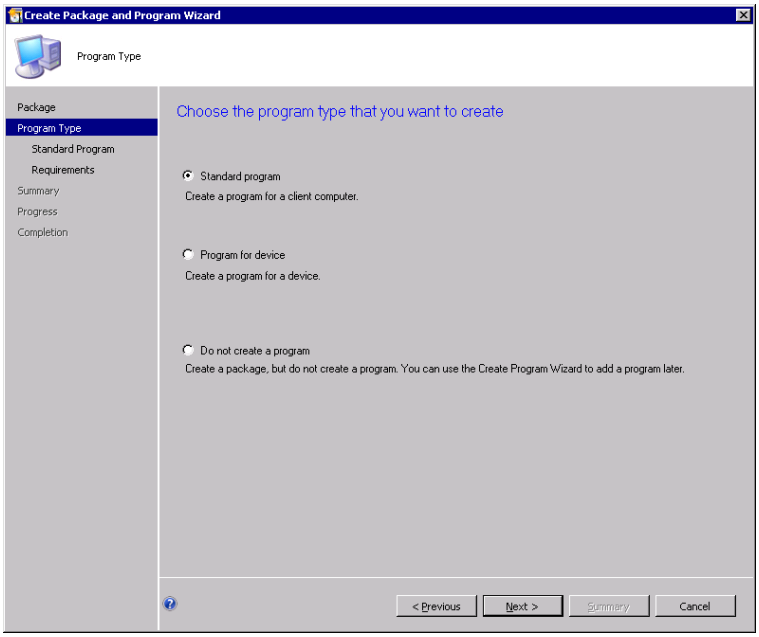
The following instructions describe creating a package for Microsoft .NET Framework 4.0 and creating a subsequent package that depends on the Microsoft .NET Framework 4.0 package.

1. To begin, start the SCCM Create Package Wizard. Skip to the “Deploying SAS Enterprise BI Server” section of this document if you need more details about the packaging wizard.

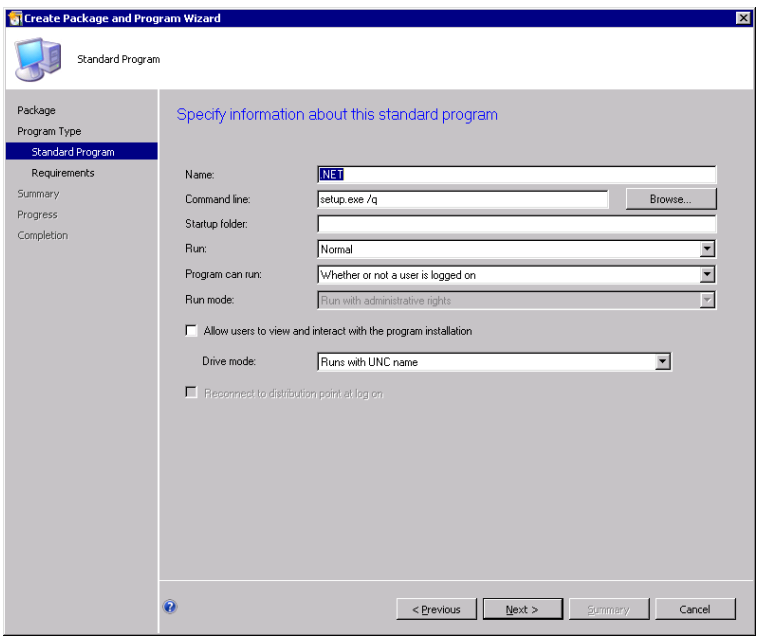
2. On the **Package** page, enter the system requirement package name, version number, and other information. Click **Next** to continue.



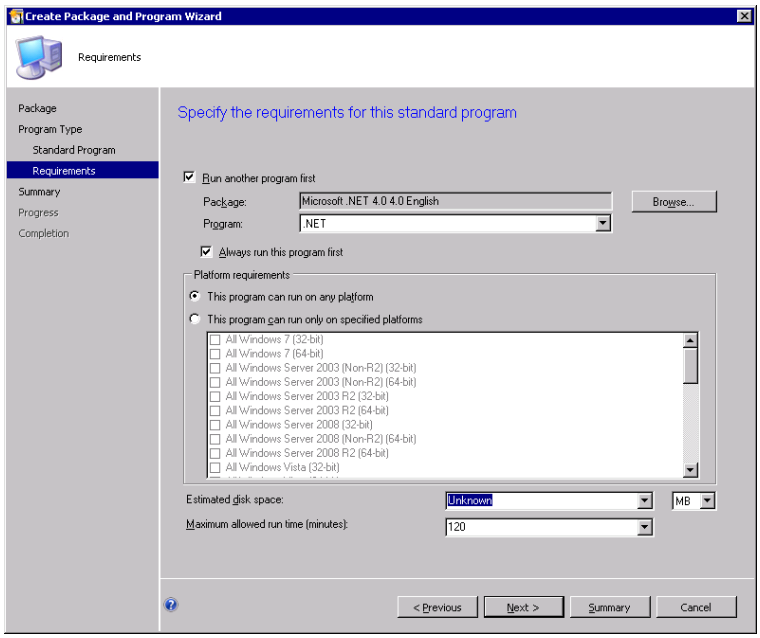
3. On the **Program Type** page, choose **Standard Program** as the program type and click **Next** to continue.



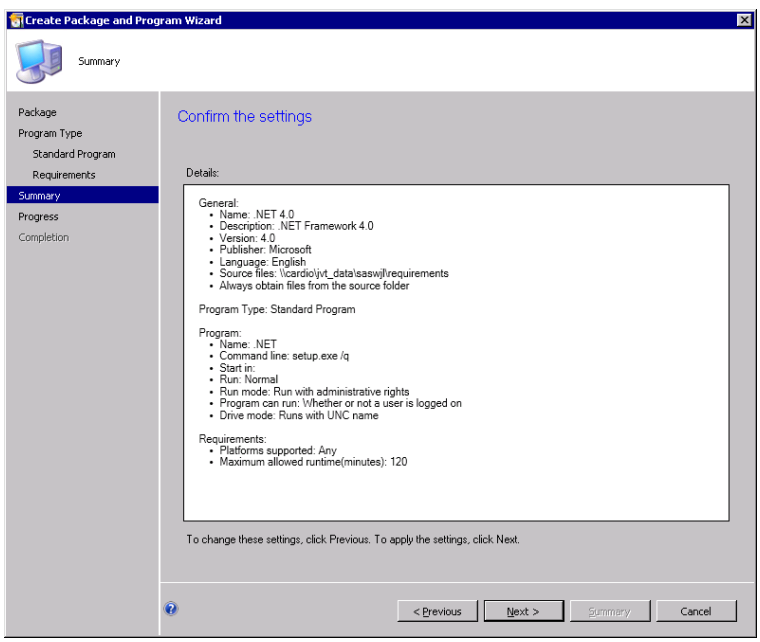
4. On the **Standard Program** page, specify the command to execute and any command line parameters. Most Microsoft redistributables support quiet installation without the need to record a response file since in most cases there is no user input required. In almost all cases, the command line switch to drive quiet installation is `/q`, but you should refer to the documentation for each requirement in order to confirm the proper command line syntax for quiet mode. Click **Next** to continue.



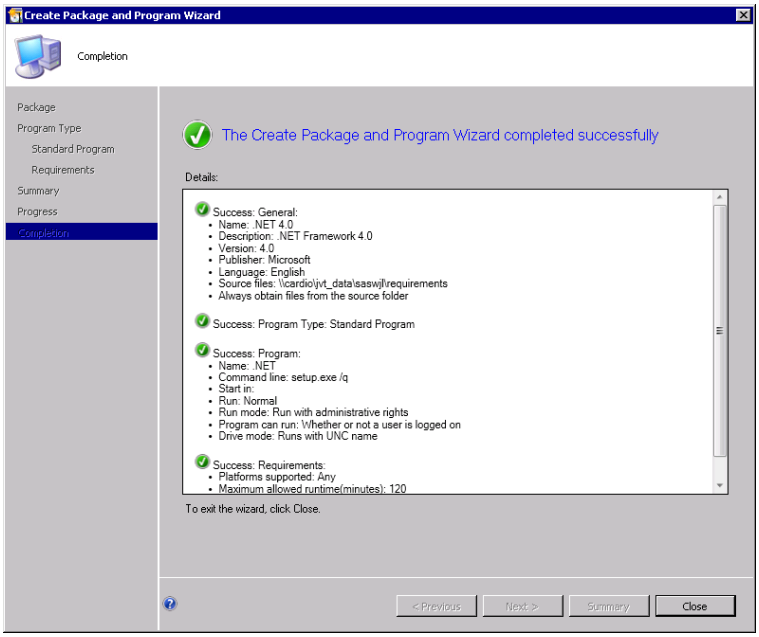
5. On the **Requirements** page, specify any additional requirements for the package and click **Next** to continue.



6. On the **Summary** page, review your entries and click **Next** to continue.

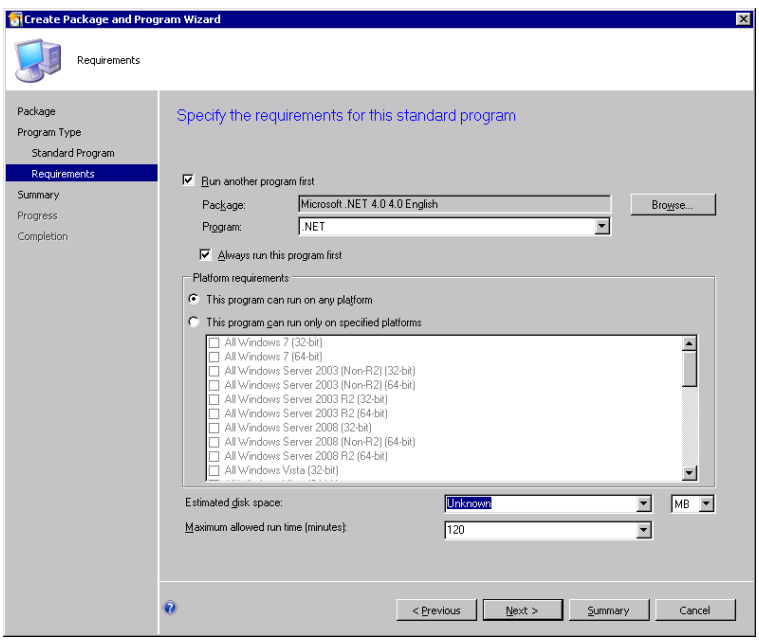


7. On the **Completion** page, verify that the package was created successfully.



8. Distribute the package to distribution points.

9. Later, when you deploy your software packages, any requirement packages that are needed should be specified as additional packages to execute. Select the **Run another program first** check box, then click **Browse** in order to view the list of available packages to execute first. Choose the appropriate package from the list. In the example below, the .NET package created above is used.



Deploying SAS Enterprise BI Server

SAS can be deployed in silent/unattended mode using the SAS Deployment Wizard's record and playback feature. This feature is documented in the *SAS Deployment Wizard and SAS Deployment Manager: User's Guide* in the "SAS Deployment Wizard: Command Line Options" chapter.

The following steps are required to deploy SAS using SCCM:

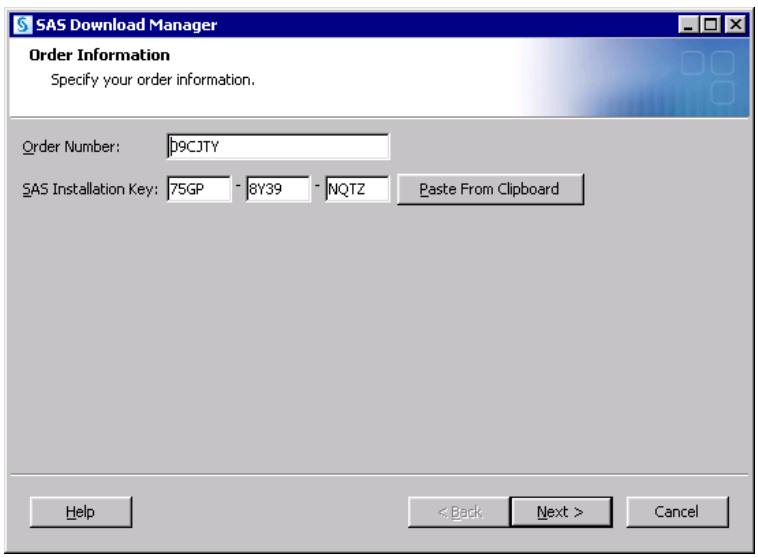
1. Create a SAS Software Depot.
2. Make the SAS Software Depot accessible to the SCCM server.
3. Record a quiet response file using the SAS Deployment Wizard.
4. Create an SCCM package for the SAS software.
5. Distribute package content to SCCM distribution points.
6. Deploy the package.
7. Monitor the install operation.

Step 1: Create a SAS Software Depot

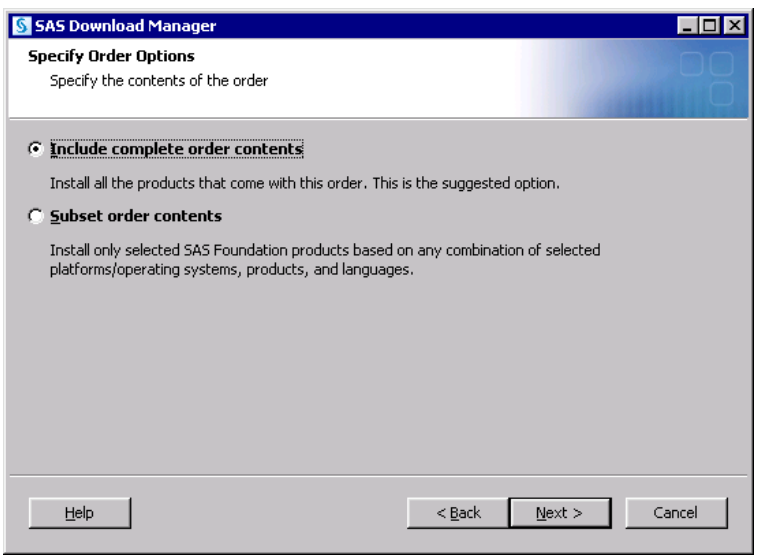
There are two options for creating a SAS Software Depot. If the depot has not been downloaded, the SAS Download Manager can be used to create the SAS Software Depot. For the purposes of this paper the SAS Download Manager will be used to create the SAS Software Depot. If a depot has already been downloaded, the SAS Deployment Wizard can be used to create another SAS Software Depot from the original.

Use the following procedure to create the SAS Software Depot with the SAS Download Manager.

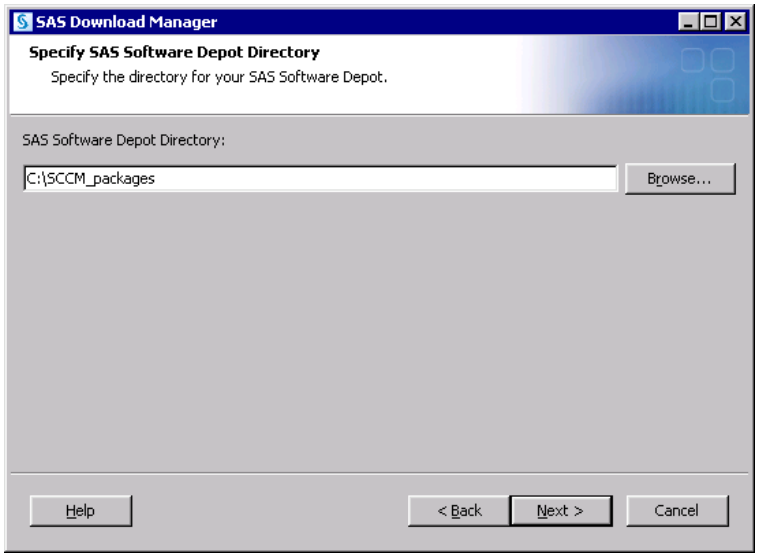
1. When prompted by the SAS Download Manager, enter the order number and SAS installation key. The order number and installation key can be found in the SAS software order e-mail.



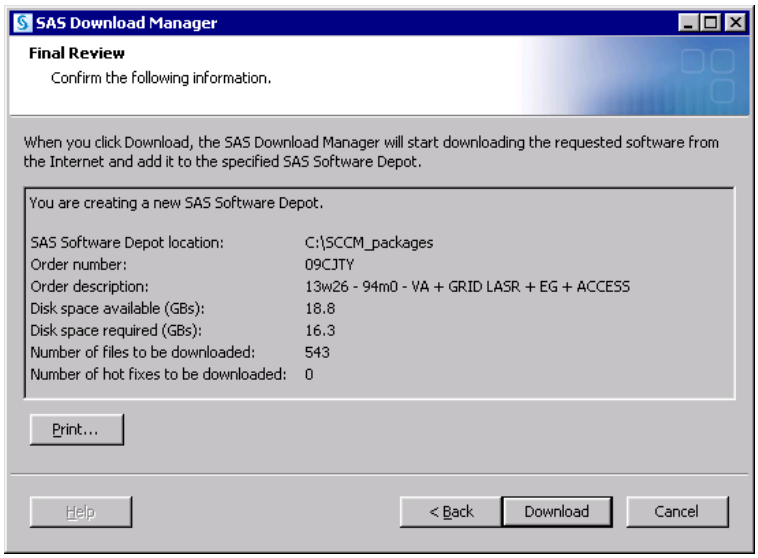
2. A subset of the order content can be created at download time. In this example, a subset was not created. However, this procedure will work with both full-content downloads and subset downloads.



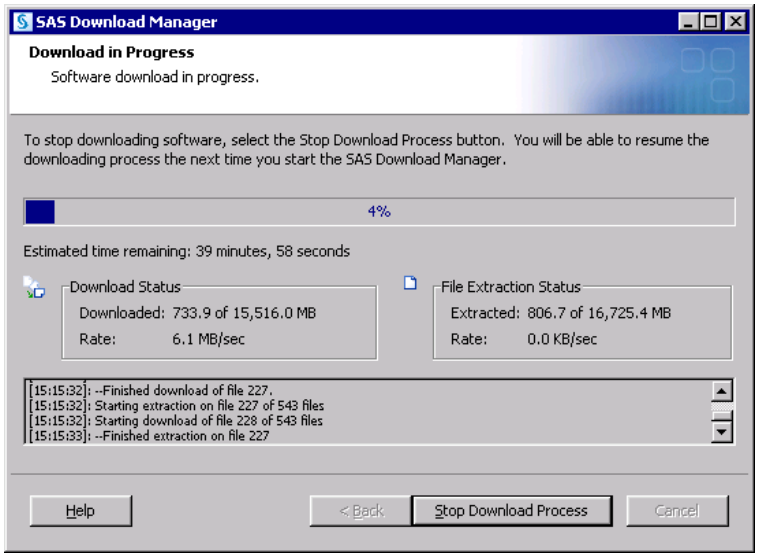
3. Specify the location at which the new SAS Software Depot should be created. You should ensure that the location you choose is accessible to the SCCM server, because it will need access to the SAS Software Depot in order to execute the SAS Deployment Wizard. Later, the SCCM's Create Package and Program Wizard will require this location.



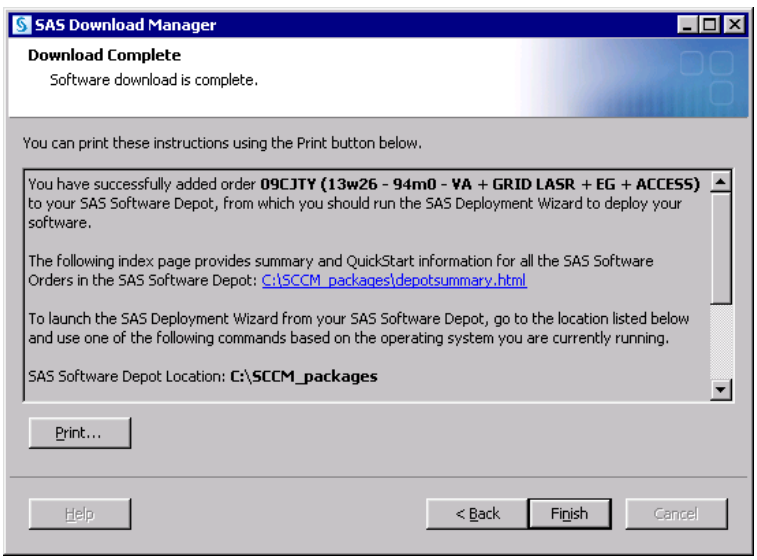
4. Confirm the parameters provided to the SAS Download Manager and click **Download** button to start the download process. The amount of time needed varies greatly based upon product payload and network bandwidth.



5. The SAS Download Manager provides detailed status information as the software is downloaded.



6. The SAS Download Manager indicates that the depot was created successfully. Click **Finish** in order to close the SAS Download Manager and move on to the next step in the provisioning process.



Step 2: Record a response file using the SAS Deployment Wizard

For SCCM to deploy SAS software silently, a response file is required. To create the response file, execute the SAS Deployment Wizard from the SAS Software Depot as follows.

```
setup.exe –record –responsefile <SAS_Software_Depot_Location>\<Response_File_Name>
```

For example, using the SAS Software Depot created previously, the command would be

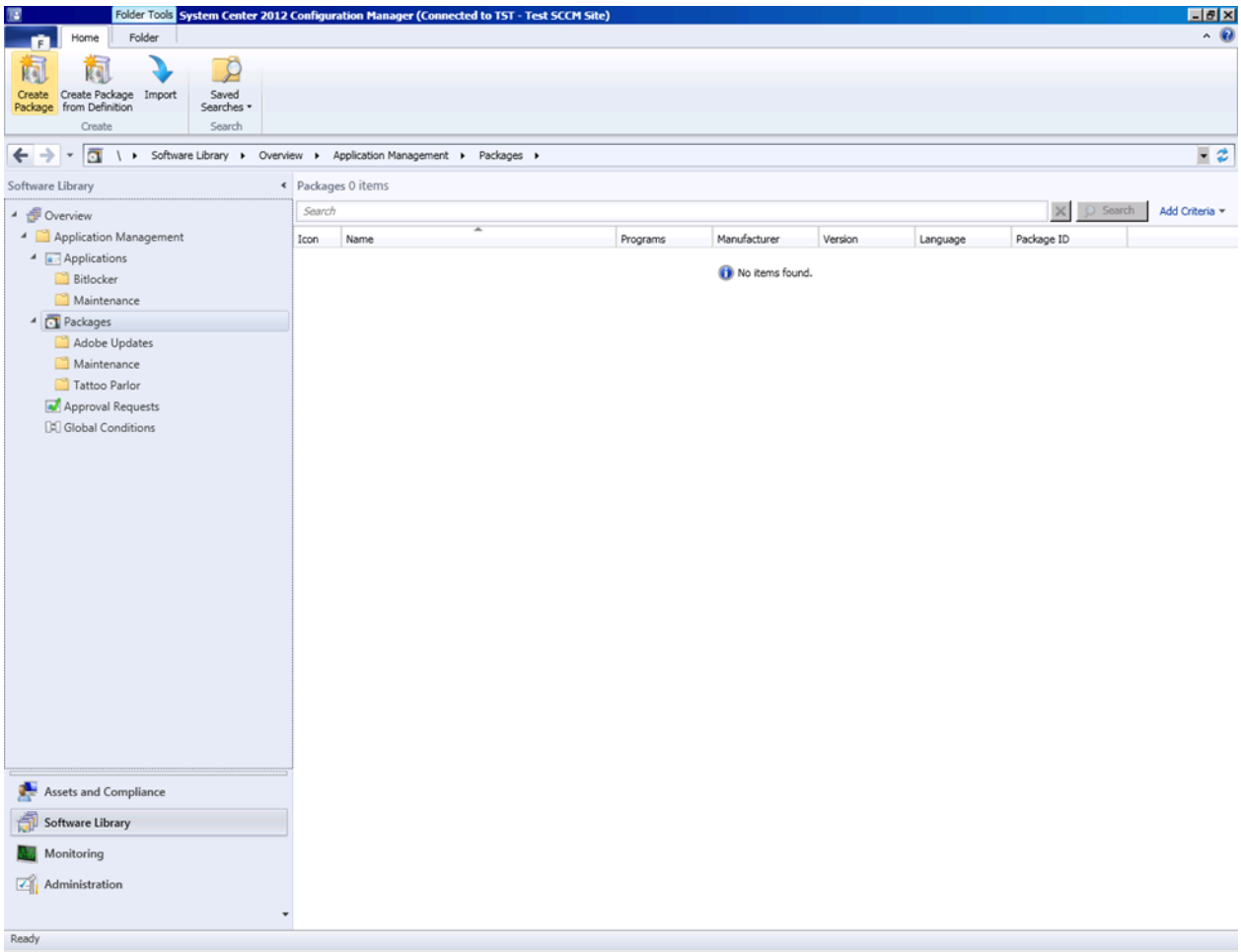
```
setup.exe –record –responsefile C:\SCCM_packages\ebiresponses.properties
```

Using this command, the SAS Deployment Wizard will only conduct the interview phase of the deployment and not alter the system. The information you provide is captured in the response file and will be read when the SAS Deployment Wizard is later executed in silent playback mode. It is important to consider that the answers provided in this phase must be applicable to all machines to which the package will be provisioned. For example, avoid specifying SAS Installation Data from a local file system which may not match the file system of another machine in the deployment.

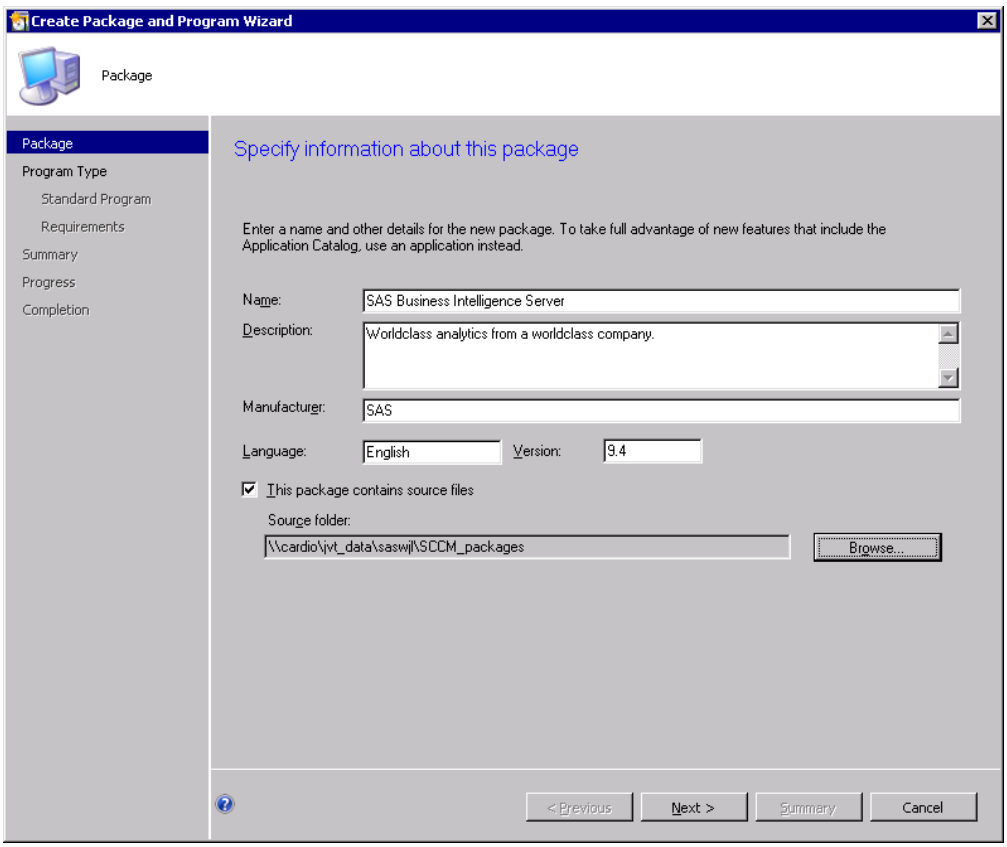
Step 3: Create an SCCM package for the SA S software

Use the following procedure to create a new SCCM package of your SAS software for distribution.

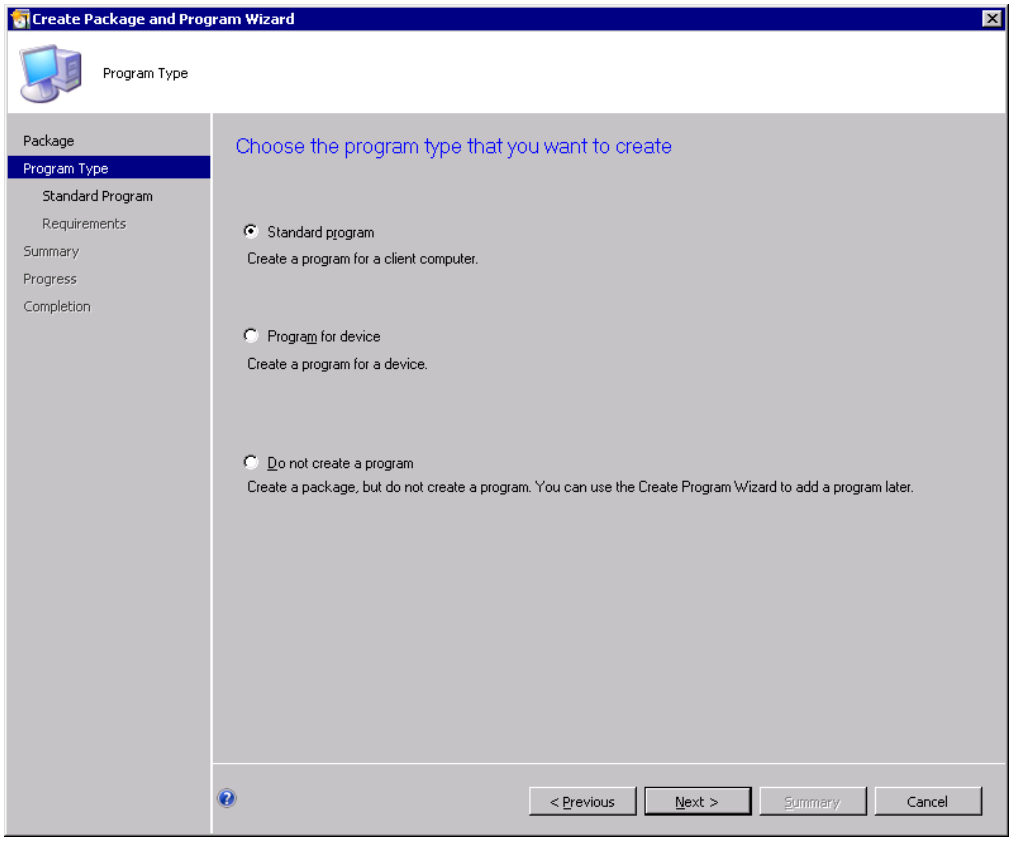
1. From the SCCM console, choose **Create Package** from the menu ribbon. You can also right-click **Packages** in the explorer view and choose **Create Package**.



2. Complete all the fields on the **Package** page of the SCCM Create Package and Program Wizard. Select the check box that indicates “This package contains source files”. “Source files” in this context means the files to be installed and the setup program (the SAS Deployment Wizard in the case of deploying SAS). Click **Browse** in order to specify the location to which the SAS Software Depot was downloaded. After you have entered the location of the SAS Deployment Wizard, click **Next** to continue.



3. At the **Program Type** page, choose the **Standard Program** option and click **Next** to continue.



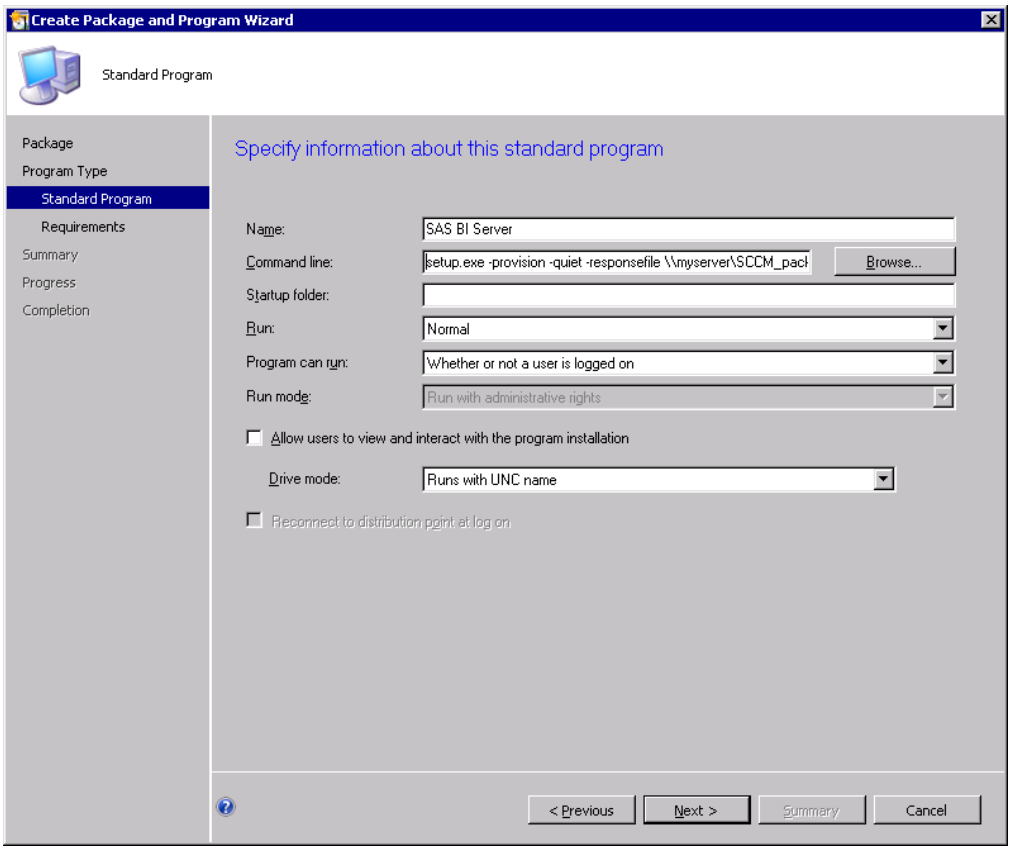
4. Complete the **Standard Program** page in the SCCM Create Package and Program Wizard. In the **Command line** field, provide the command line to execute the SAS Deployment Wizard silently using the previously captured response file. The command to do this is

```
setup.exe -quiet -responsefile <Fully_Qualified_Response_File_Name>
```

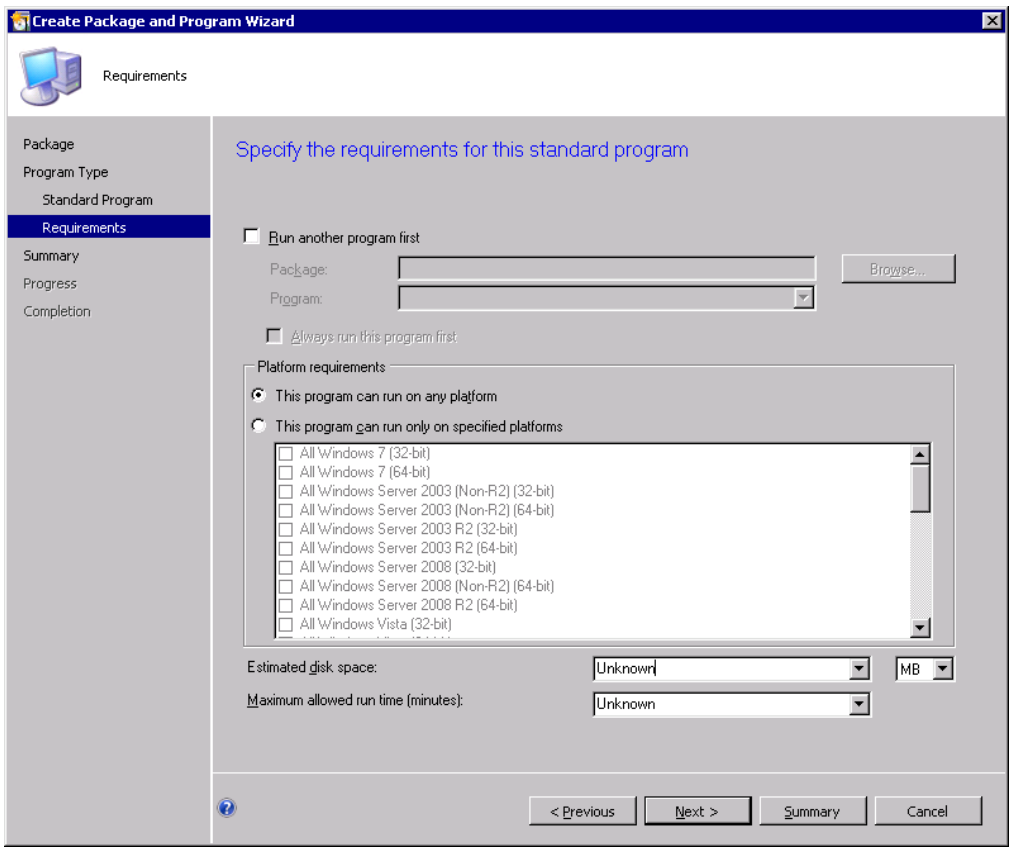
For example,

```
setup.exe -quiet -responsefile \\myserver\SCCM_package\responses.properties
```

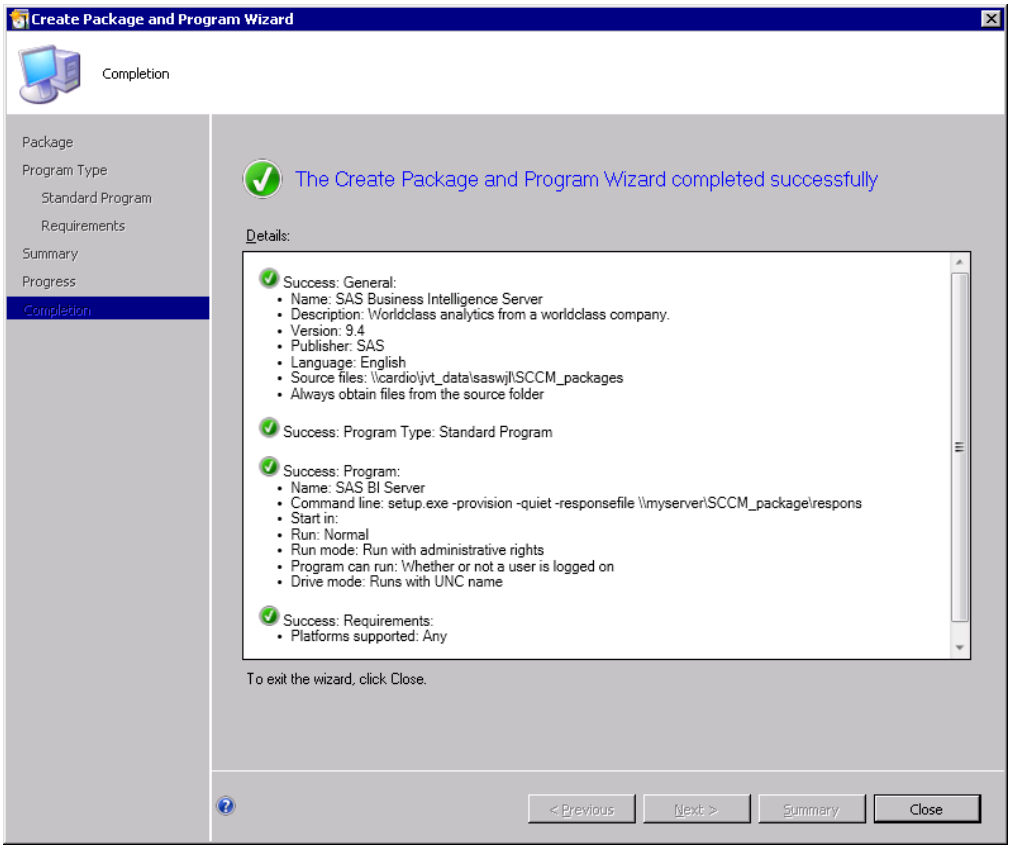
When the page has been completed, click **Next** to continue.



5. The **Requirements** page allows you to restrict the platforms upon which the package can be executed. Additionally, you can also provide disk space estimates and a maximum time for execution. Click **Next** to continue.



6. Confirm the settings for the package on the **Completion** page and click **Next** to continue. SCCM will work briefly for a few seconds before confirming that the package was created successfully. Click **Close** to exit the Create Package and Program Wizard.



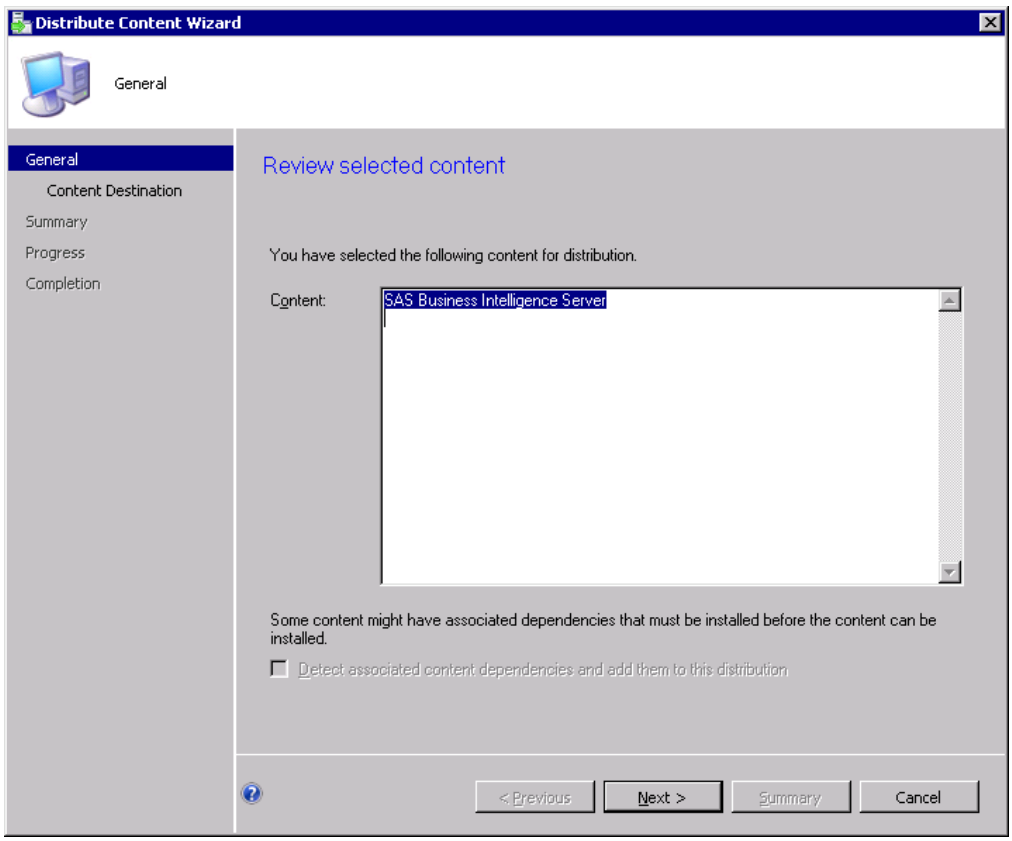
Step 4: Distribute package content to SCCM distribution points

Use the following procedure to distribute the package you have created to SCCM distribution points.

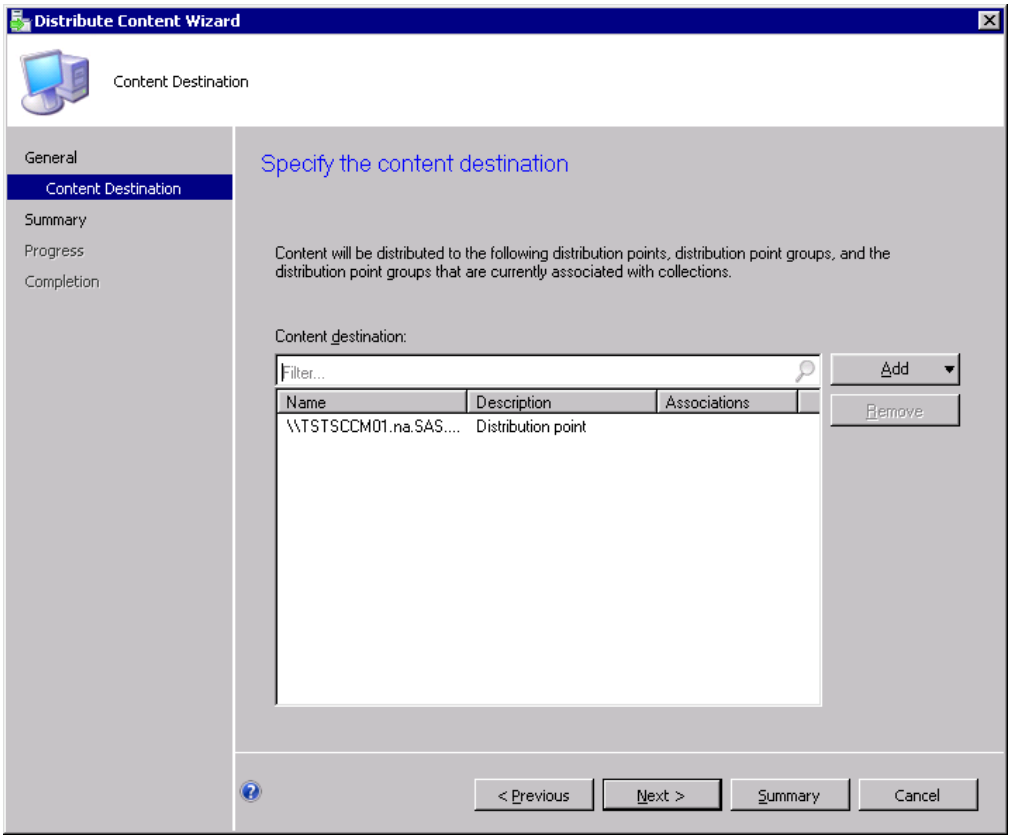
1. In the SCCM console explorer, click on **Packages** to see a listing of all available packages. Select the SAS software package you created in step 3. Choose **Distribute Content** to add the package to a single SCCM distribution point or choose **Update Distribution Points** to copy the package to all SCCM distribution points. These selections are available from the menu ribbon or by right-clicking the package name.

   For this example, the **Distribute Content** selection will be used to add the package to a single distribution point.

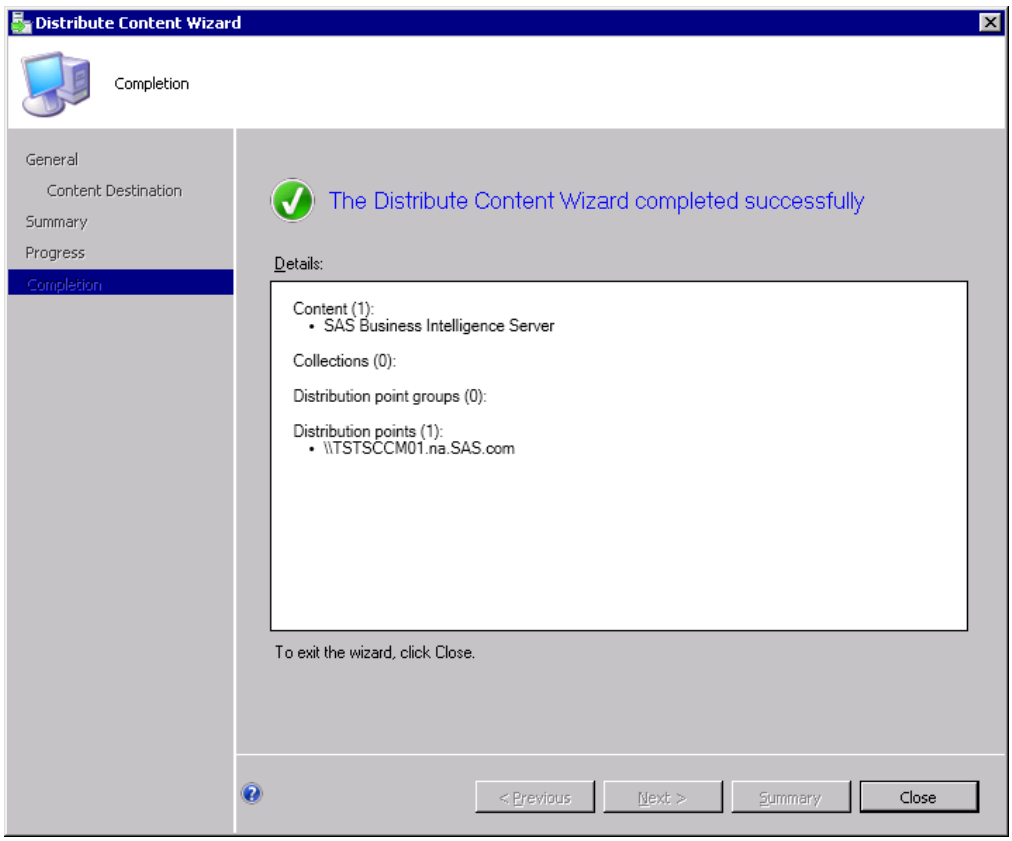
2. Review the selected content on the **General** page of the SCCM Distribute Content Wizard. Click **Next** to continue.



3. Use the **Content Destination** page to specify the distribution point or points to which content should be distributed. Click **Add**, then select **Distribution Point** from the menu that opens. Specify the distribution point or points to which content should be distributed, then click **OK**. When you have finished making your list, click **Next** to continue.



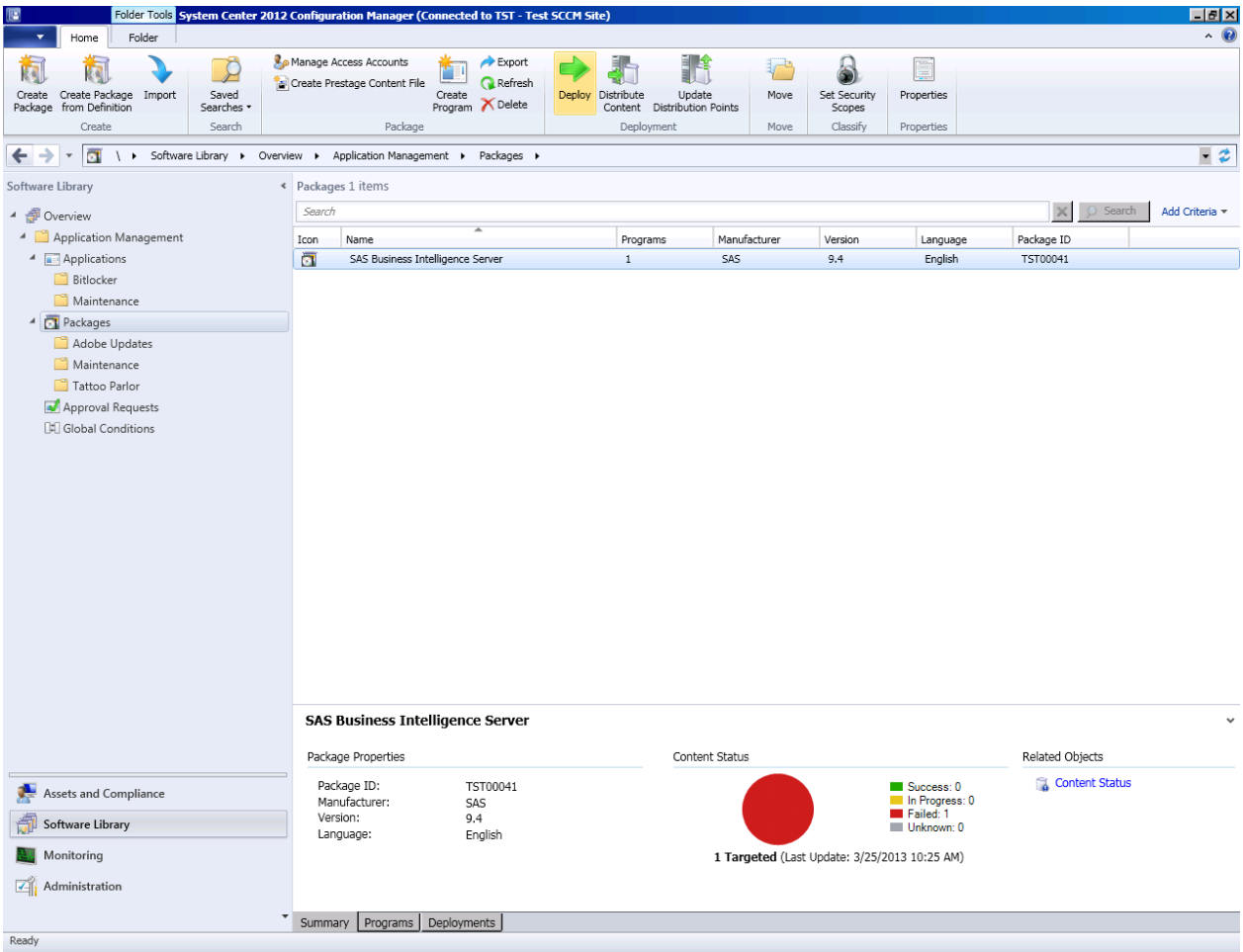
4. Review the specified settings on the **Summary** page. Click **Next** to distribute the package. After the distribution has been completed, confirm that the results are what you expected.



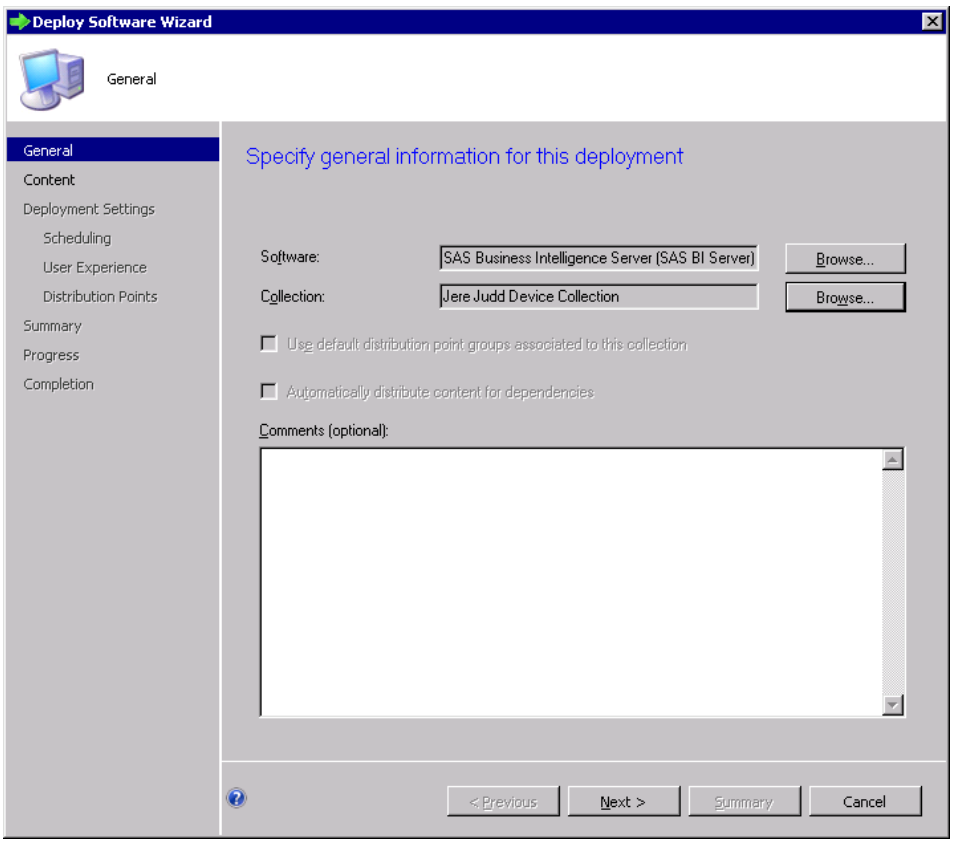
Step 5: Deploy the package

This section describes how to deploy the package from distribution points to a collection. If the SCCM concept of collections is unfamiliar, refer to the “Creating and Modifying Collections” topic in the SCCM help documentation. This paper assumes that the reader either already has collections created or knows how to do so.

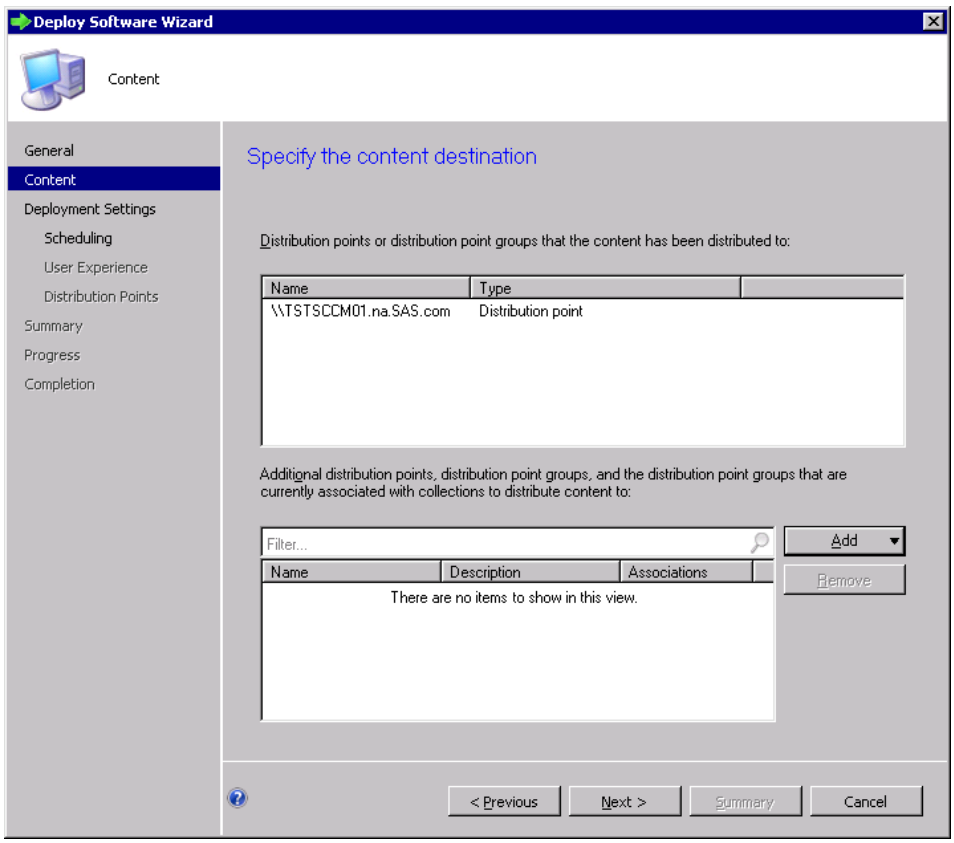
1. In the SCCM console window, select the package and click **Deploy** in the menu ribbon.



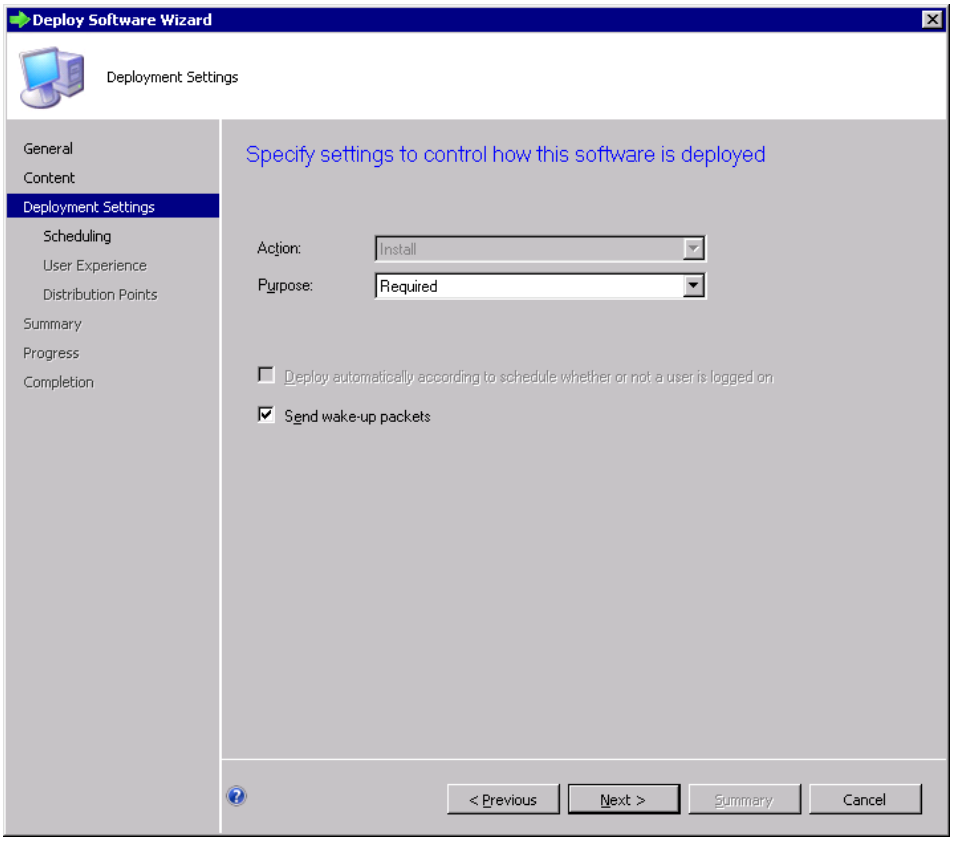
2. Use the **General** page of the SCCM Deploy Software Wizard to select the collection on which the package will be installed. Click **Browse** next to the **Collection** field and choose the desired collection. Click **Next** to continue.



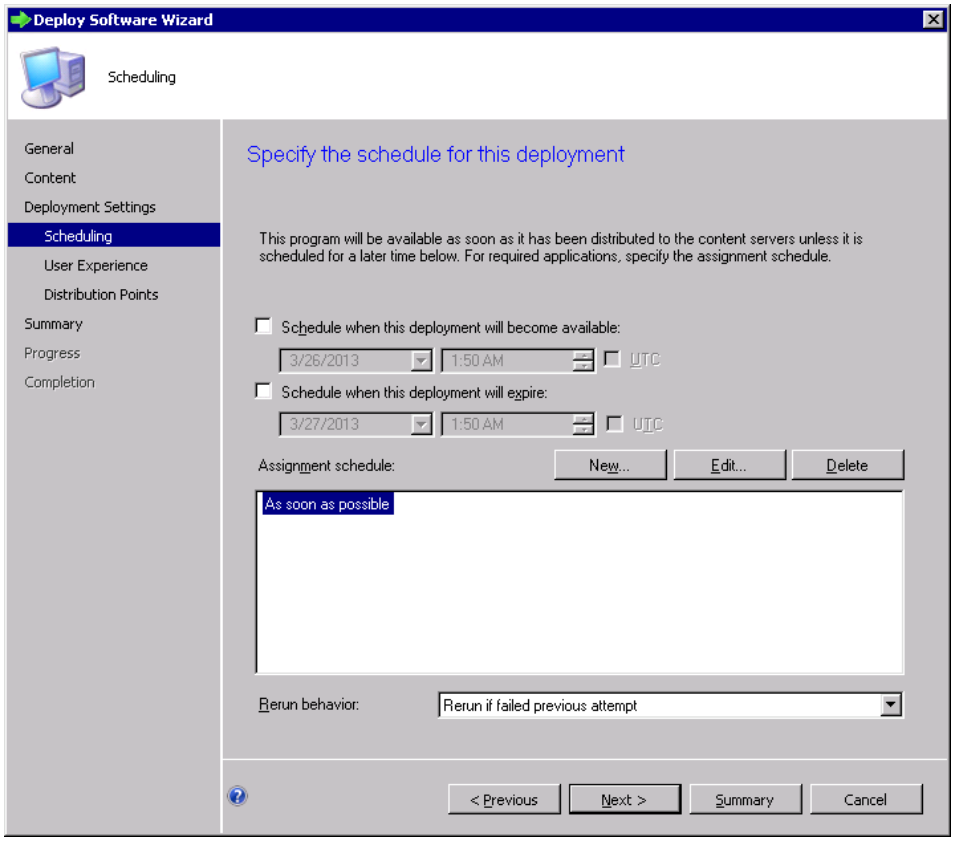
3. On the **Content** page, verify that the distribution points which contain the package contents are listed. Click **Next** to continue.



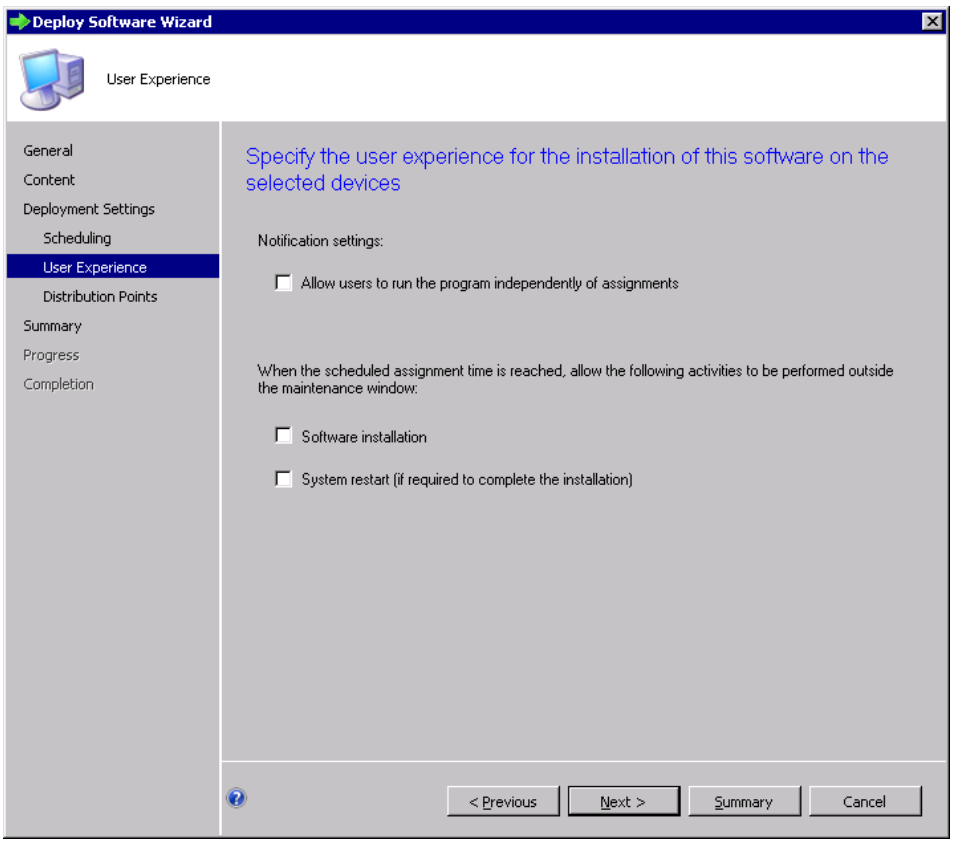
4. On the **Deployment Settings** page, specify the options for how to deploy the software. Verify that the **Action** is set to **Install**, and then choose the **Purpose** from the menu. Selecting **Available** makes the software available for installation, while **Required** indicates that the software will be installed. This example assumes the **Required** purpose. Click **Next** to continue.



5. On the **Scheduling** page, choose the schedule for deployment of this package. For this example, the option to deploy "As soon as possible" was chosen. To do this, click **New** beside "Assignment schedule", and select the **Assign immediately after this event** option. Click **OK** to close the window, and then click **Next** to continue.

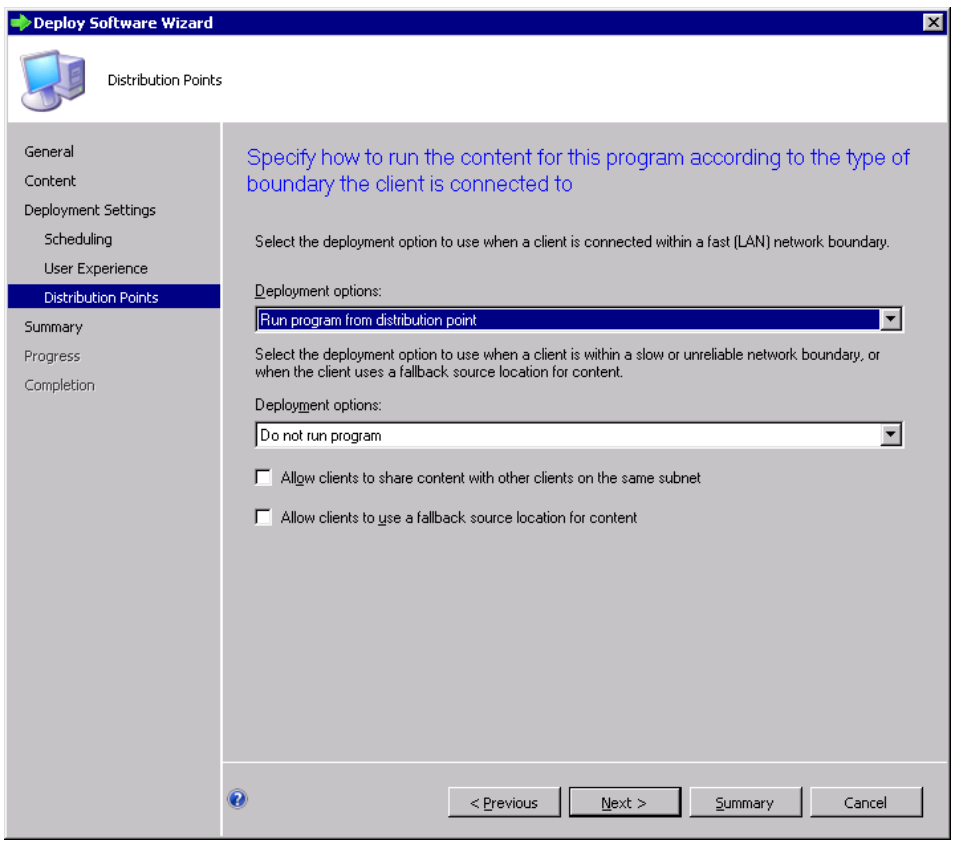


6. On the **User Experience** page, make any user experience selections desired. For this example, no tailoring of user experience was selected.

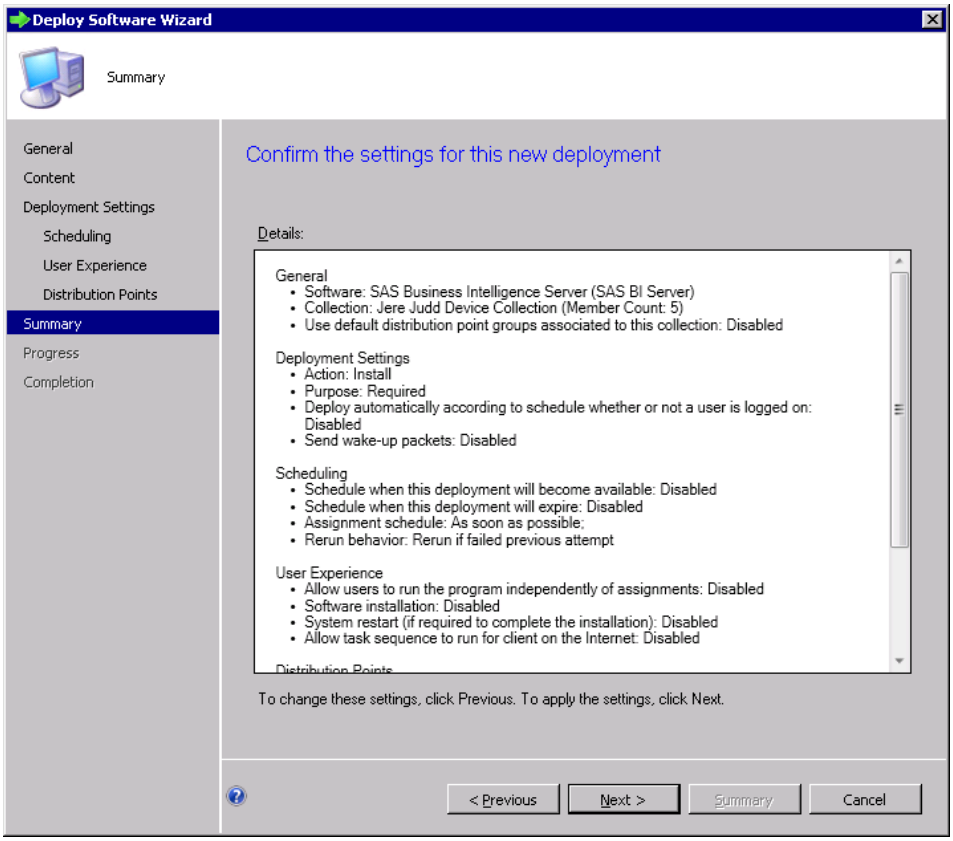


7. On the **Distribution Points** page, make choices about how the content will be accessed and deployed. Since a SAS Software Depot can be large, SAS recommends running the program from the distribution point. In some cases, policy may prevent running from the distribution point. In these cases the entire package will have to be downloaded to each target machine and the setup executed from there. Since the SAS Software Depot contains all software entitlements for a given order and can be very large, content that does not and will not install on the target machine may be downloaded unnecessarily. It is for this reason that SAS recommends running from the distribution point. All other options will vary by use case. Choose from the other options as appropriate for your environment.

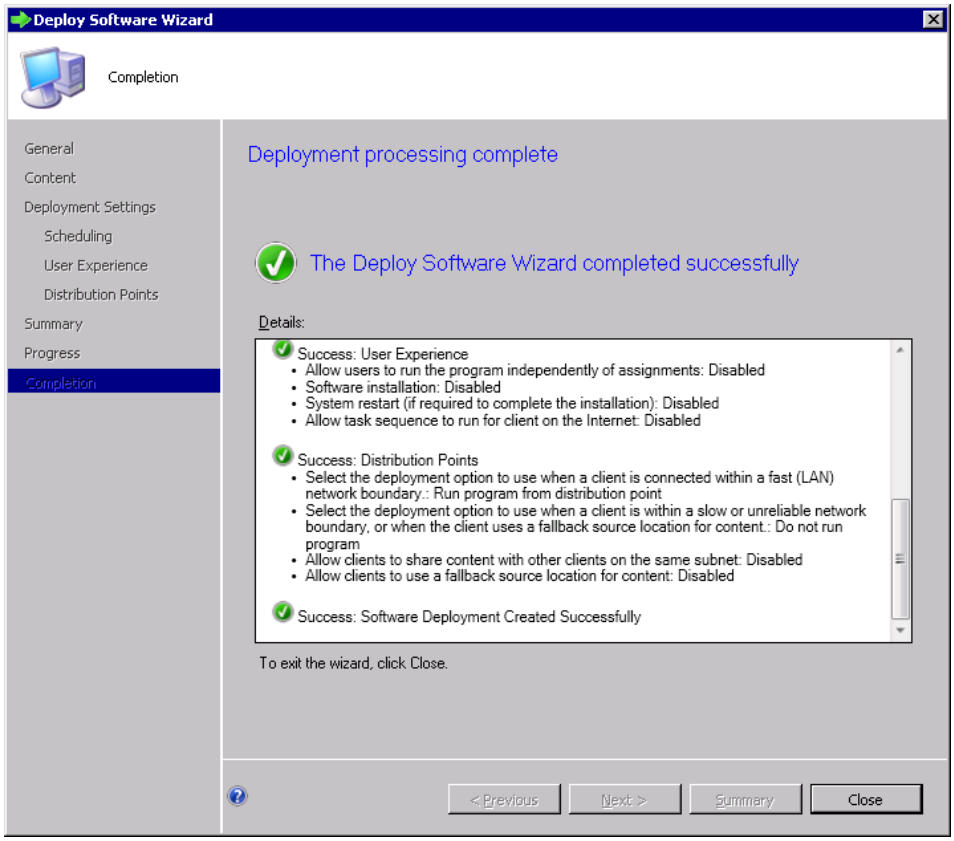
   To deploy the software from a distribution point, select **Run program from distribution point** in the first **Deployment options** menu. Click **Next** to continue.



8. Review the **Summary** page, and click **Next** to execute the deployment.



9. Review the **Completion** page, and verify that each step succeeded.



Step 6: Monitor the package deployment

You can monitor the progress of the deployment by navigating to the “Monitoring” view in the SCCM console and clicking **Deployments** in the explorer window.

Deploying SAS Enterprise Guide and the SAS Add-in for Microsoft Office

Starting with the 9.4 release, SAS provides a streamlined installation process for the two most popular SAS clients for Windows—SAS Enterprise Guide and the SAS Add-in for Microsoft Office. The streamlined versions are included with orders that included the clients, in the “standalone_installs” folder at the root of the SAS Software Depot. The next section of this document will walk through how to create packages for each of these and deploy them through SCCM.

Use the following steps to deploy SAS Enterprise Guide and SAS Add-in for Microsoft Office software via SCCM:

1. Make the setup programs accessible to the SCCM server.
2. Record response files.
3. Create SCCM packages.

4. Distribute packages to SCCM distribution points.
5. Deploy the packages.
6. Monitor the install operations.

Step 1: Make the setup programs accessible to the SCCM server

The SCCM server needs access to the setup programs, so ensure that the SAS Software Depot is accessible by the server. The location of the SAS Software Depot will be provided to the Create Package and Program Wizard in step 3 below.

Step 2: Record response files

This section describes how to create response files for SAS Enterprise Guide and SAS Add-in for Microsoft Office.

1. Start a command prompt and navigate to the folder which contains the SAS Enterprise Guide setup program. Run the setup program with the record and response file options. For example,

```
C:\eg_amo_standalone>signed_eguide_x64.exe -- -record -responsefile C:\eguide.properties
```

2. Follow the steps to complete the installation wizard. Note that in record mode no changes are made to the system. Only a response file is created for subsequent playback at a later time.
3. Repeat the process for the SAS Add-in for Microsoft Office setup program following the steps to complete the installation wizard. For example,

```
C:\eg_amo_standalone>signed_msofficeint_x64.exe -- -record -responsefile C:\amo.properties
```

Step 3: Create SCCM Packages

This section describes creating the SCCM packages for SAS Enterprise Guide and the SAS Add-in for Microsoft Office.

1. From the SCCM console, choose **Create Package** from the menu ribbon. You can also right-click **Packages** in the explorer view and choose **Create Package**.
2. Complete all the fields on the **Package** page of the Create Package and Program Wizard. Select the check box that indicates “This package contains source files”. “Source files” in this context means the setup program. Click **Browse** in order to specify the location at which the setup programs were saved. Click **Next** to continue.
3. At the **Program Type** page, choose the **Standard Program** option and click **Next** to continue.
4. Complete the **Standard Program** page in the Create Package and Program Wizard. In the **Command line** field, provide the command line to execute the SAS Deployment Wizard silently using the previously captured response file. The command to do this is

```
signed_eguide_x64.exe /verysilent -- -quiet -responsefile C:\eguide.properties
```

5. Repeat the process for the SAS Add-in for Microsoft Office. The command to specify in the command line field for this package is

```
signed_msofficeint_x64.exe /verysilent -- -quiet -responsefile C:\amo.properties
```

Step 4: Distribute packages to SCCM distribution points

This section describes how to make the packages available on SCCM distribution points for subsequent deployment. Use the following procedure to distribute the package content to SCCM distribution points.

1. In the SCCM console explorer, click on **Packages** to see a listing of all available packages. Select the SAS Enterprise Guide and SAS Add-in for Microsoft Office packages (use CTRL+left-click to select more than one package). Choose **Distribute Content** to add the package to a single SCCM distribution point or choose **Update Distribution Points** to copy the package to all SCCM distribution points. These selections are available from the menu ribbon or by right-clicking the package name. For this example, the **Distribute Content** selection will be used to add the package to a single distribution point.

2. Review the selected content on the **General** page of the Distribute Content Wizard. Click **Next** to continue.

3. Use the **Content Destination** page to specify the distribution point or points to which content should be distributed. Click **Add**, then select **Distribution Point** from the menu that opens. Specify the distribution point or points to which content should be distributed, then click **OK**. When you have finished making your list, click **Next** to continue.

4. Review the specified settings on the **Summary** page. Click **Next** to distribute the package. After the distribution has been completed, confirm that the results are what you expected.

Step 5: Deploy the package

This section describes how to deploy the package from distribution points. The following is the procedure to deploy the SCCM package to a collection. If the SCCM concept of collections is unfamiliar, refer to the “Creating and Modifying Collections” topic in the SCCM help documentation. This paper assumes that the reader either already has collections created or knows how to do so.

1. In the SCCM console window, select the package and click **Deploy** in the menu ribbon.

2. Use the **General** page of the Deploy Software Wizard to select the collection on which the package will be installed. Click **Browse** next to the **Collection** field and choose the desired collection. Click **Next** to continue.

3. On the **Content** page, verify that the distribution points which contain the package contents are listed. Click **Next** to continue.

4. On the **Deployment Settings** page, specify the options for how to deploy the software. Verify that the **Action** is set to **Install**, and then choose the **Purpose** from the menu. Selecting **Available** makes the software available for installation, while **Required** indicates that the software will be installed. This example assumes the **Required** purpose. Click **Next** to continue.

5. On the **Scheduling** page, choose the schedule for deployment of this package. For this example, the option to deploy “As soon as possible” was chosen. To do this, click **New** beside “Assignment schedule”, and select the **Assign immediately after this event** option. Click **OK** to close the window, and then click **Next** to continue.

6. On the **User Experience** page, make any user experience selections desired. For this example, no tailoring of user experience was selected.

7. On the **Distribution Points** page, indicate how the content will be accessed and deployed. Since the packages for SAS Enterprise Guide and the SAS Add-in for Microsoft Office are much smaller than SAS Software Depots, SAS recommends using the **Download content from distribution point and run locally** option. Configure other settings as appropriate for the environment, and click **Next** to continue.

8. Review the **Summary** page, and click **Next** to start the deployment.

9. Review the **Completion** page, and verify that each step succeeded.

Step 6: Monitor the package deployment

You can monitor the progress of the deployment by navigating to the “Monitoring” view in the SCCM console and clicking **Deployments** in the explorer window.

Deploying Client Connection Profiles

In addition to large-scale distribution of client software, it is often desirable to distribute client connection profiles. These profiles are used by clients to determine connection settings to SAS Metadata Servers. Distributing the client connection profile can help ease administration burden by eliminating the need to provide SAS Metadata Server machine names and ports to end users. Users will still need to provide user IDs and passwords at logon time, but distributing the client connection profile assures that those connections are being made to the correct SAS Metadata Servers. This paper will use SAS Enterprise Guide as the example client application.

To provision the client connection profile, follow these steps:

1. Perform an installation of SAS Enterprise Guide on a test machine.

2. Launch SAS Enterprise Guide and define SAS Metadata Server connection profiles.

3. Locate the `ConfigurationV#.xml` file where # is the version number of SAS Enterprise Guide. This file can be found in `%APPDATA%\SAS\MetadataServerProfiles`.

4. Edit the `ConfigurationV#.xml` file to remove the user ID and password values. See the example below (changes are bolded). Do not remove the `<User>` or `<Password>` tags.

```
<?xml version="1.0" encoding="utf-8"?>
<Configuration LastWrittenBy="Engine Configuration Manager">
 <Profiles>
 <Profile>
 <Name>Test</Name>
 <Description>Test</Description>
 <Type>OMS</Type>
 <HostName>test.unx.sas.com</HostName>
 <Port>8561</Port>
 <UseIWA>False</UseIWA>
```

```
<SaveLogin>True</SaveLogin>
<User></User>
<Password></Password>
<Parm></Parm>
</Profile>
</Profiles>
<Settings>
<ActiveProfile>Null Provider</ActiveProfile>
<GenerateLocalServer>False</GenerateLocalServer>
</Settings>
</Configuration>
```

5. Create a new package to deploy the connection profile to `%ALLUSERPROFILE%\SAS\MetadataServerProfiles`. SCCM will expect to execute a program to perform the copy. This can be done by implementing the copy of the connection profile in a batch script. A popular alternative to the SCCM packaging route is to copy the connection profile into place as part of a Windows logon script. Either approach will work provided the connection profile ends up in the proper location on the client machine.

   Note that the location on the client machines is the ALL user profile as opposed to the user profile. When SAS Enterprise Guide is invoked by any user on the machine, SAS Enterprise Guide will search the locations above for `ConfigurationV#.xml` and copy it to `%APPDATA%\SAS\MetadataServerProfiles` so that users can have individual connection profiles.

Conclusion

Management of distributed systems poses challenges for IT staff. Tools such as SCCM plus the SAS Deployment Wizard's record and playback capabilities help manage the deployment complexity of distributed systems. A consistent and scriptable deployment experience is available across all SAS deployment related tools and utilities. Hot fixes applied through the SAS Deployment Manager, the SAS Renewal Utility and others all support record and playback modes. Refer to the SAS Deployment Wizard User's guide for instructions on how to record and playback execution of these tools so that other administrative tasks like license renewals can be provisioned via tools like SCCM. Using record and playback capabilities can be applied to any third party provisioning system. While the specific instructions in this document are for SCCM 2012 the concepts of recording silent response files and playing back unattended installations is universal across all provisioning systems.

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