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The Lowdown on the Download: What's Really in My SAS® Software Depot and How Did It Get There?

Brian Andrews, Gary Burchett, Donna Bennett, SAS Institute, Inc., Cary, NC

ABSTRACT

As a SAS® administrator, you are often asked to make something happen "yesterday".   Electronic software delivery makes it easier to get new software from SAS when you need it, without waiting for a snail-mail delivery of media.   Review the process of retrieving SAS software into a shared SAS software depot for all of your deployments, and for creating custom depots and media when you choose. Navigate the settings that help you make the process speedy and secure, and learn why keeping the depot around can streamline future deliveries.

INTRODUCTION TO ELECTRONIC SOFTWARE DELIVERY

In recent years, SAS has received an increasing number of requests to deliver our software electronically. Beginning with SAS 9.2, SAS has made Electronic Software Delivery (ESD) a standard production process and the preferred software delivery method. By downloading SAS software from the Internet instead of receiving it by means of physical media, you can retrieve software at your convenience.   Once the software is downloaded, you have the option of creating physical media on-site if needed. We encourage you to try the ESD system. If it doesn't work for you, you can request media.

Reasons that you choose to receive your SAS software order electronically might include some of the following:

- You can retrieve SAS software over the Internet rather than waiting for media to arrive in the mail. Please confirm that you have a high-speed Internet connection to support the transfer. (Mail times from Cary, NC will vary based on your location.   International shipments must pass through customs.)
- ESD is environmentally friendly. Both you and SAS Institute, Inc. protect our environment by eliminating the need to expend resources on a physical media and shipment of software.
- You lessen office clutter, and your software is cataloged electronically.
- In some US states and foreign countries, there might be reduced tax or tariff benefits.
- Some software content that can be restricted for physical delivery might be able to be electronically delivered due to variations in import laws.

This paper covers the general considerations about planning, preparing, and implementing ESD, as well as using the SAS Software Depot as the source for installing and configuring a SAS deployment. This paper describes the authors' own experiences and conclusions reached in using ESD internally at SAS headquarters and while working with customers. We also address frequently asked questions.

This paper is designed to help an administrator plan and prepare for retrieving SAS software using ESD. Information in this paper is also helpful for wider audiences, including the following:

- anyone who wants to understand the ESD processes and benefits
- IT professionals who want to retrieve their SAS software electronically (versus on media)
- IT professionals who need to set up communication links and disk storage
- IT and purchasing contacts who need to choose between ESD and media for SAS software orders

ELECTRONIC SOFTWARE DELIVERY (ESD) AT SAS, AN OVERVIEW

Electronic delivery of SAS software uses the Internet rather than physical media to deliver software to a customer's site. The steps are simple:

1. request SAS software

2. retrieve SAS software

3. deploy SAS software

SAS Software Depot
(customer's site)

Internet access

SAS "ESD Server"

Using Electronic Software Delivery to Retrieve Software

Figure 1: Conceptual ESD Data Flow

 A customized SAS software order is prepared for electronic retrieval, and stored on one of the SAS ESD servers that are available worldwide.   Using the Internet, the customer initiates the download and creates or updates a SAS Software Depot located at the customer's site.

After the SAS software is downloaded into a SAS Software Depot on a computer at the customer's site, that depot can be used to create or update a SAS Deployment. SAS uses the phrase SAS deployment to describe the collection of SAS software and the related components that are designed to work together. A SAS deployment can span one or more real or virtual machines.   The deployment process encompasses any activity in which SAS software is installed, configured, patched, setup, tested, and documented for general consumption by end users.

Figure 2: ESD Creates a SAS Software Depot That Is Used To Create or Update a SAS Deployment.

The depot can be on a separate designated machine, or the depot can be one of the machines in the SAS deployment. You are not required to download your SAS software to a workstation or personal computer.

TOOLS AND TERMS

- The **SAS Download Manager** is a Java application that manages the download process and creates or updates the SAS Software Depot at the customer site. The SAS Download Manager supports
restarting an interrupted transfer, recovering from transmission errors, and detecting and avoiding potential file corruption during the transfer.

- The SAS representative at a customer site receives a **SAS Software Order E-mail (SOE)** after an order is processed. The SOE lists the software that the customer has ordered, and provides the instructions, links, and codes that are needed to retrieve the software.

- **SAS Software Depot** is an organized library of SAS software orders. It can be created electronically or from media, and it is required to deploy most SAS software.

- A **SAS deployment** is the collection of SAS software and related components that are designed to work together as an integrated system. The deployment process encompasses any activity in which SAS software is installed, configured, patched, setup, tested, and documented for general consumption by end users

- **SAS Deployment Wizard** is a SAS administrative utility that is designed to manage SAS Software Depots and the deployment process.

- A **SAS order** describes the customized collection of SAS software that is licensed for a customer and that is delivered electronically or physically in response to a purchase request.

WHY DO WE NEED THE SAS DOWNLOAD MANAGER? WHY CAN'T WE USE FTP?

The ESD process adds security and administrative controls to the transfer process, which leverages the HTTP protocol rather than FTP. Each SAS order is customized, and a SAS order can contain hundreds of parts, which are formatted to ensure secure and reliable delivery. To maintain the appropriate security

and relationship between parts of an order, SAS created the SAS Download Manager to control the Electronic Software Delivery process.

The SAS Download Manager enables encrypted and secure access over the Internet using the HTTP protocol. Many customer sites restrict access to the Internet when using FTP.   However, most sites allow HTTP protocol access to the Internet either directly or through a proxy server.

The SAS product content that is downloaded by the SAS Download Manager is encoded, and will be extracted and verified as it is downloaded and stored in the SAS Software Depot. It is extremely unlikely that any transmission errors or product content alteration would not be detected.

The SAS Download Manager has three primary functions:

- download all the parts of a SAS order
- verify the order content
- organize content and build a SAS Software Depot

Key benefits of using the SAS Download Manager to control the transfer include the following:
- enables the transfer process to be resumed if it is interrupted
- optimizes the transfer by assessing the target depot location and delivering only those files in the software order that have changed

THE RELATIONSHIP BETWEEN ESD, A SAS SOFTWARE DEPOT, AND DEPLOYMENT

Most software offered by SAS consists of a collection of many specialized products operating as a suite. After deciding upon your purchase, SAS creates an order, which defines the set of software components that are needed to satisfy your deployment. When you receive a Software Order E-mail from SAS, it contains an order number and a key, which must be entered into the SAS Download Manager in order to download your product set to a SAS Software Depot. These two values are all that you need to identify what you wish to download from SAS.

The destination to which you download can be any location that contains enough space for the entire order and that allows write access by the user ID performing the download. Note that you create a SAS Software Depot whether you are retrieving software electronically or you have received physical media.

The key that is used to download an order is different than the license key (sometimes described as the setinit or SAS installation data file (SID)) that is needed to run your SAS deployment.

Customers are encouraged to store a copy of the license and deployment files that are associated with an order in the SAS Software Depot. SAS automatically stores the initial SID for an order in the SAS Software Depot. Customers will need to copy renewal SIDs to the depot. Multiple SID files as well as SAS orders that contain content that run on different machines and different operating systems can be stored in a single SAS Software Depot.

When a depot is delivered from SAS, the **plan_files** subfolder within the depot is empty. If you use a standard deployment plan, you can copy the associated preinstallation checklist and deployment diagram into this directory. If you use a customized deployment plan, you can store the plan and the associated files into this directory. This is the default location where the SAS Deployment Wizard will look for a nonstandard deployment plans.

OPTIMIZE FUTURE DOWNLOADS

Beginning with SAS 9.2, a SAS Software Depot is designed to contain multiple software orders and license files. The value to keeping your SAS Software Depot after deployment is complete is to help optimize delivery of software for future orders you that you might place. If you download future orders to an existing SAS Software Depot, you only need to retrieve the individual products that are not already present in the SAS Software Depot.

In the SAS Software Depot, software products and components can be shared among multiple orders. This reduces your download time and can save a considerable amount of disk space at your site. Having a single SAS Software Depot with all of the software that youhave received for a major SAS release helps to organize your orders such that they are easy to find and deploy.

AN EXAMPLE

Suppose your very first order from SAS is 5 GB in size. Later, you decide that you wish to add an additional product to your deployment. Purchasing the additional product will result in a new order being created, which contains all of your original software, plus the new product that you requested. Assuming that this new product is 100 MB in size, this would yield a new order that is 5.1 GB.

Downloading this new order to a brand new location will require 5.1 GB to be transferred over the Internet and written to disk. If you download to the existing SAS Software Depot, only 100 MB will be downloaded since you already have 5 GB of the content present in the SAS Software Depot. Both orders would occupy about 5.1 GB of disk space.   If you used a separate SAS Software Depot for your old and new orders, you would download and occupy about 10.1 GB of disk space. This same cost savings applies for downloading maintenance orders, as downloading to your existing SAS Software Depot requires only the changed components to be retrieved, rather than the full order.

PLANNING AND PREPARING FOR ESD

The most successful projects step through five major phases: plan, prepare, implement, validate, and rollout. This is true whether you are downloading software or planning a major system deployment.   SAS analysis shows that the most successful deployments spend up to 50% of the project time on planning and preparation. While the download process is fairly straightforward, we encourage you to review the requirements for both the download and the deployment, and that you set up the target environment for the depot before you start the electronic download process. Investing in planning and preparation for a software download will help the rest of the process proceed more smoothly.

USER ACCOUNTS AND FILE PERMISSIONS

SAS recommends that a SAS installer account be used when deploying SAS software. Therefore, you should ensure that the SAS installer account has Read and Execute access to the SAS Software Depot that is created or updated during the download process.   Since the SAS installer account needs administrator privileges (when deploying SAS software), many sites prefer to have a different account perform the download and depot creation.

Note: SAS recommends that UNIX sites use the same account (user ID) to perform the download and the depot creation. This user ID will be used later to deploy the SAS software if the site has security policies that change or override any of the permissions that are associated with files in the SAS Software Depot.

The user ID performing the download needs Read, Write, and Delete permissions to the download location. Administrative or Root permissions are needed only in special situations during the download

process, typically based on site policies or configuration.

The user performing the electronic software delivery retrieval process will need to be a registered user of the support.sas.com Web site to retrieve the SAS Download Manager, and will need to have Read, Write and Delete permissions to the download location.

No Administrative or Root privileges are needed to download SAS software using the Electronic Software Delivery processes and the SAS Download Manager. If you are setting up the SAS Download Manager to run on a Windows Vista (or later release) operating system and your machine or site has selected enhanced security controls, you might need Administrative privileges to initially install the SAS Download Manager.   After the SAS Download Manager is installed, Administrative privileges are no longer needed.

By default, a SAS Software Depot is owned by the user who creates the depot. Therefore, when creating a SAS Software Depot for the first time, the user does not matter. However, when adding orders to an existing SAS Software Depot, it might matter.   As a best practice, SAS recommends that the same user ID be used for all downloads to a shared SAS Software Depot. The user ID performing the download needs Read, Write, and Delete permissions to the download location.

 Write permission is needed to create or add content to a SAS Software Depot.
- On Windows, the user adding an order to an existing depot must have write permission to that depot. This can be achieved as a result of users being in a common group.
- On UNIX, the permission assigned when creating the SAS Software Depot is 0755, which means only the owner has write access. Files and subdirectories are also created with 0755 permission. While you can change the default permission to allow a group of users to write to the depot, SAS strongly recommends that you use a single user IDfor all downloads.

- Note that you do not need Write access to deploy from a SAS Software Depot. Write access is required to create and manage the content of the SAS Software Depot itself.

Read permission is needed to recognize what content might already exist in the SAS Software Depot.

Delete permission is needed to complete the transfer and clean up the processes associated with the download.
- After the depot is built, the SAS Deployment Wizard will clean up the download directory (or the staging directory when retrieving the SAS software using media).
- Details are addressed in SAS notes. See http://tsdsrv05.unx.sas.com:7777/iw/docs/sasnotes/fusion/36/685.html.

WINDOWING ENVIRONMENT REQUIRED

Ensure that a windowing environment such as the Common Desktop Environment or X11 server,is installed or accessible before you run the SAS Download Manager to create a SAS Software Depot. Refer to the third-party software page on support.sas.com for additional information and links to sites that offer downloads.

TIMING TOPICS RELATED TO ELECTRONIC SOFTWARE DOWNLOADS

When do you download software?   You can download your SAS software anytime after you receive the order and the download information in a Software Order E-mail. The content of the order will not change, even if you wait several weeks before you download the software.

What happends when the network is interrupted?   If you lose the network connection or have other interruptions during the transfer, the SAS Download Manager can resume the download at the point of

the interruption. Content that has already been successfully transferred will not be transferred again. Restart the SAS Download Manager if it has been stopped.

How long will it take to download? You can estimate the time it will take to download you order based on the size of your customized SAS software order and the speed of your Internet access link. Unfortunately, there is no typical download transfer rate.   "The last mile" is often the critical element in the connection and the transfer time.

This table below provides some very general rule of thumb guidelines for estimating the download time. All SAS orders are customized, so there is no typical size. Using the information in you Software Order E-mail, the minimum transfer speeds for downloading 10GB of data, and the speed of your network access, you can calculate a rough estimate of the time. Interruptions or slow networks can make the time longer. Optimizations can shorten the time.   Once you start running the SAS Download Manager, the progress bar displays the best estimate of the time that is needed to download your order using the available connection.   If you need this more specific estimate during your planning cycle, you can start the SAS Download Manager, and then suspend the download.

Minimum time to download 10GB

Speed	Days	Hours	Minutes
56Kbps	17	18	5
128Kbps	7	18	24
256Kbps	3	21	12
512Kbps	1	22	36
768Kbps	1	7	4
1.544 Mbps (T1/DS1)		15	27
44.736 Mbps (T3/DS3)			32

Figure 3: Minimum Transfer Speeds for 10GB of Data to Assist in Estimating Download Times

The SAS ESD bandwidth service provider can accommodate high speeds. Typically, however, a site's internal connection speed and the speed of the connection to the Internet ("the last mile") is typically the determining factor in the transfer rate. SAS compresses the content before sending it, and extracts and validates the content when building the depot. All file transfer processes include some transmission overhead. Once all the content has been downloaded, some additional processing is performed by the SAS Download Manager.

If you are adding a new product order or maintenance for an existing order to a current SAS Software Depot, then SAS can optimize the download. The SAS Download Manager analyzes the order to be retrieved, and transfers only those software components that have not previously been loaded into the target SAS Software Depot. This optimization can shorten the transfer time significantly.

SPACE REQUIREMENTS AND LOCATION CONSIDERATIONS

You will download your SAS order into a new or existing SAS Software Depot. Choosing your download location carefully can save you download time and might help you avoid problems when you start deploying the SAS software. The location to which you download an order must be accessible to the Internet. The location needs to have adequate space to accommodate the order and the user ID that performs the download needs to have Read, Write, and Delete permission to the target file system.

Since the SAS Download Manager, and eventually the SAS Deployment Wizard, will be run from this location, ensure that the file system is not mounted with a -noexec option.

Estimating the space that is required for your SAS Software Depot requires some knowledge of the order and where it is to be downloaded.   The total amount of space needed for a SAS Software Depot will change as you add orders to the depot. The SAS Software Order E-mail provides an estimate of the maximum space that is needed for a specific order. Likewise, the SAS Download Manager displays an estimate of the maximum required disk space, based on the order number supplied by the user.   While the space needed to download a specific order will never be larger than the sum of its parts, it is highly likely that the additional space that is required will be less than the size of the order when you are adding orders to an existing SAS Software Depot. The amount of this reduction depends on the content of the order being downloaded and what might already reside in the target SAS Software Depot.

A SAS Software Depot can contain all of the SAS software your site has licensed for a given major release of SAS. The identity of each separate order is maintained in the depot, and is referenced by the order number. You can store all orders based on SAS 9.2 in a single SAS Software Depot. A single depot can contain orders that have been downloaded and orders that are loaded from media. This ability to contain multiple orders is different from the limits of the SAS Software Depot in 9.1.3, where a depot could contain only a single order.

When you request maintenance for an existing order or add a new product license to an existing site, SAS delivers a customized order that contains all of the products that you have licensed. Thus, when you download a maintenance order or an add-on order, you benefit from using the same SAS Software Depot as the original order because only the new or updated content will need to be downloaded. The SAS Download Manager controls the process, and transfer only those parts of the software order that were not previously loaded into the customer's SAS Software Depot. If you use a new SAS Software Depot, then the whole order content will be downloaded again.

When multiple orders are downloaded to a single SAS Software Depot, the installable content of each order is preserved. This means that if a maintenance order is added to a SAS Software Depot that contains an order without maintenance, the deployment user will have the option of installing from either order, thus including or excluding the maintenance. While the SAS Software Depot contains the products and maintenance components necessary to fulfill all of the orders in that SAS Software Depot, each order only references the product or maintenance set that is applicable for that order. As a result, combining orders in a single SAS Software Depot saves considerable amounts of space and download time while maintaining independence among orders for deployment purposes. This strategy allows for multiple orders to exist in a single SAS Software Depot, with the smallest footprint possible.

You can ease your download and deployment processes by considering the setup of the SAS Download Manager and the location of the SAS Software Depot while you are planning for your SAS software deployment. Ask yourself these questions:

- Does the location to which I'm downloading already contain a SAS Software Depot, thus reducing the amount of space needed to add an additional order?
- Have I chosen a location that can be accessed by the machines on which I will be deploying the downloaded software?

While a SAS Software Depot can certainly be moved from one location to another, there is the potential for corruption, permission problems and other such issues depending on the transfer strategy that is used to move the SAS Software Depot. Details on how a SAS Software Depot can be relocated are available in the "Moving Your SAS Software Depot" section of this document.

FIREWALL CONSIDERATIONS

When a site has firewalls, special steps might be needed to enable the download and subsequent deployment of the SAS software. This section on firewalls illustrates several typical firewall configurations and identifies potential issues or customizations that you will need to address.

While the software is being transferred, the SAS Download Manager must be able to access the target location for the SAS Software Depot at the customer site, and it must be able to access the SAS ESD server site.   When you are ready to install the SAS software, the depot must be in a location that is accessible to the machine(s) that will host the SAS deployment.

The SAS download process can work in a variety of secure environments. It is designed to interact easily and transparently with proxy servers. If your site has a more robust firewall, however, you will need to designate firewall openings, or you can download to an accessible location and then move the SAS Software Depot.   Specific IP host names are used by the download processes. Of course these might change in the future.

The ESD service is designed around standard HTTP (TCP port 80). SAS expects that customers can reach the electronic software delivery server site(s) similarly to accessing any other HTTP Web service.

No Firewall

Customer SAS Server
- Ultimate location of
SAS/Depot

Download Location
for SAS Depot

SAS ESD Server

Figure 3: A Scenario with No Firewalls. Proxy Servers Can Be Used

This diagram depicts a site with no firewalls. There should be no problems accessing the SAS ESD servers to download your SAS order. Once you have reviewed the space requirements for the target location and have retrieved the most current SAS Download Manager program, you can retrieve the SAS software at your convenience.

The SAS Download Manager supports most standard proxy servers. If your proxy server requires authentication, the SAS Download Manager supports both Basic authentication and NTLM authentication. On Windows, the SAS Download Manager is usually able to automatically detect the proxy server settings as used by the web browsers. On other systems the user might have to manually provide the proxy settings.

Although the SAS Download Manager interacts with most proxy servers transparently, sites with complex security environments will require special setup.   In particular, you might need to work with your network security team to create secure openings in your firewall so that software can be downloaded to your site.
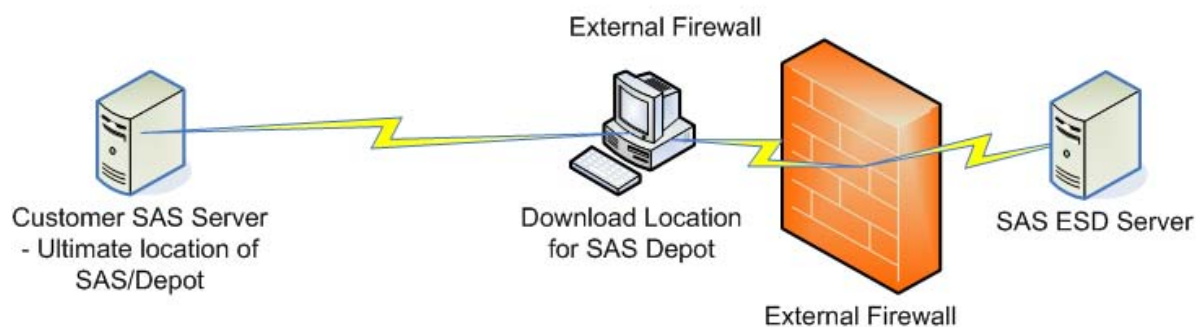
Figure 4: External Firewall

This site has an external firewall.   Most firewalls allow direct access to the Internet using HTTP. In some cases, a proxy server is used to circumvent the firewall.   If access requires the use of a proxy server, the SAS Download Manager will automatically attempt to determine and use system proxy server settings.

If the SAS Download Manager cannot access a SAS ESD server, it will prompt you for information about a possible proxy server.   You will be given the option to specify information about your proxy server, including an HTTP server name, a port number, a user name and a password. You will not be permitted to proceed beyond this page until the SAS Download Manager has been able to establish communication with SAS.

- If you are presented with this dialog boxg, fill in the fields with the information applicable for your environment. You might need to contact your network administrator for details.

Some sites have additional site "white" lists that only allow Internet access to preapproved sites. In this case, the network administrator might need to add SAS ESD server sites to the approved list.

Some sites might implement a virus or anti-spyware scanning of all downloaded content in the proxy server interface. In some situations, this scanning software can interfere with the SAS download process, and trigger errors, such as "Access is denied", or other copy failure messages.   When this happens, the network administrator might need to disable scanning of software downloaded from the SAS ESD servers.   Due to the way SAS encodes the download content, a virus, or anti-spyware scan will never correctly scan SAS download content. If you want to scan the content, it is recommended that you do so after the depot has been built. Refer to SAS note 31427 (support.sas.com/kb/31/427.html) for additional details.
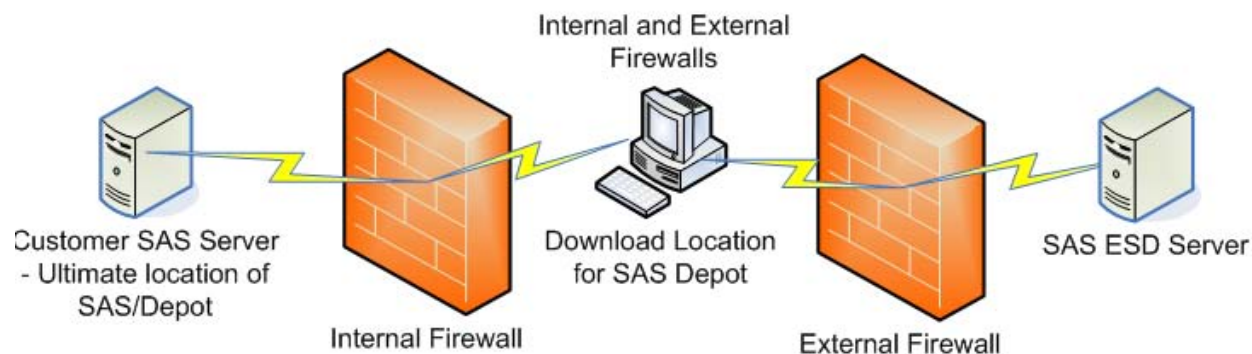
Figure 5: Internal and External Firewalls

In Figure 5, the download location for the SAS Software Depot has a firewall on either side of it.. There are restrictions getting to the internal network (where the SAS software will ultimately be deployed), and there are restrictions getting to the outside network where the SAS ESD server is located. The targeted machine(s) for the SAS Deployment is located behind an internal firewall. Ultimately the depot must be accessible to the machine(s) that are part of the SAS deployment in order to install the software.

In this scenario, the download location has the same issues described in the previous figure on external firewalls. Refer to that section for issues and options.

Once the download of the content is complete, the SAS Software Depot must be available to the system(s) targeted for the SAS Deployment. This can be done by opening up access through the internal firewall or by copying the SAS Software Depot to a location inside the internal firewall.

Keep in mind that if you don't keep the depot accessible to the external download process, you cannot optimize subsequent software downloads for maintenance and new products. You could set up strategies to keep the download location for SAS Software D epot synchronized with a depot that is copied to the internal network. For example, a site could implement synchronization using tools such as rsync or RoboCopy. SAS does not have any restrictions on the processes that a site uses if they choose to maintain synchronized copies of the SAS Software Depot.   You could also back up the depot, and restore it before retrieving an additional SAS software order.
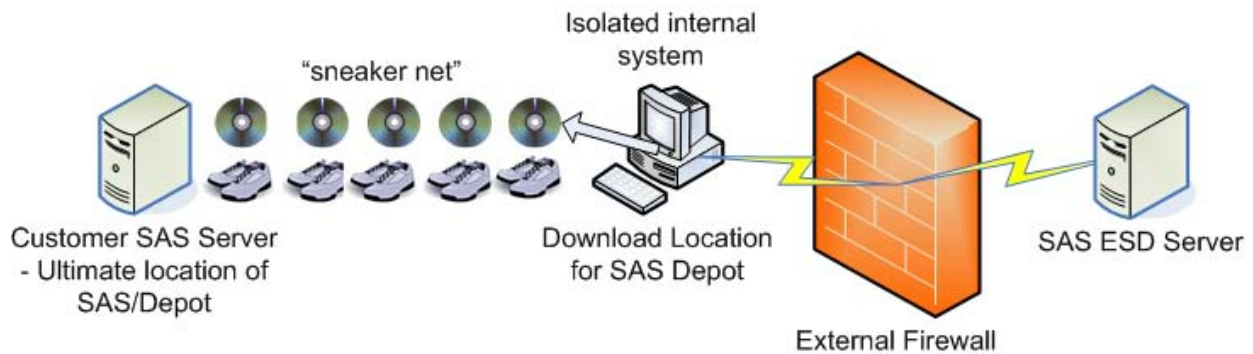
.

Figure 6: External Firewall, an Isolated Internal System and "Sneaker Net"

In this scenario, the download location is not connected to the internal Internet (where the SAS software will ultimately be deployed).   This restriction means that the customer has to address the same access issues as in the two previous scenarios.

When the target machine(s) for deployment does not have any network access to the SAS Software Depot that is built by the download process, the contents of the SAS Software Depot must be physically carried and transferred to a location accessible to the targeted deployment machine(s). This physical transfer process is often referred to as "sneaker net". Options for this transfer include the following:

- Create the SAS Software Depot on a portable disk drive when you initially download the depot.
- Move the SAS Software Depot to a portable disk drive after it is downloaded.
- Use the SAS Deployment Wizard to extract the SAS order from the depot, and then create the media.

The approach you choose for making a copy of the depot available to the internal machines needs to meet your local security constraints and media availability.

As in previous scenarios, SAS recommends that you maintain a copy of the depot in a location where it can be used to support downloads in the future for maintenance or add-on orders.

STANDARD SAS ESD SERVER HOSTNAMES

If you are behind a firewall and cannot use a proxy server, you need to enable access to several SAS host names. The SAS Download Manager will use one or more of the host names noted below to contact SAS:

- support.sas.com   (currently 149.173.5.120)
- esd.sas.com   (currently 149.173.5.152)
- npc.esd.sasinstitute.net   (currently 192.58.183.83)
- inh.esd.sasinstitute.net   (currently 192.58.183.83)
- hq.esd.sasinstitute.net   (currently 149.173.5.153)

Customers outside of the US and Canada will also be contacting this host:
   bwp1.esd.sasintitute.net   (Random IP address assigned by Bandwidth provider)

When the SAS ESD Internet links are heavily used or the download content is from outside the continental United States, the ESD system will also use a 3rd party bandwidth provider. In that case the download process will be directed to

bwp2.esd.sasinstitute.net   (Random IP address assigned by Bandwidth provider)

INSTALLING THE SAS DOWNLOAD MANAGER SOFTWARE

You must download the SAS Download Manager before you start the full download process to retrieve a SAS software order. The latest version of the SAS Download Manager is available from the SAS support Web site, support.sas.com. If you don't already have a profile for this site, you will be required to create a profile using the free sign-up process before you can retrieve the SAS Download Manager.

If you have downloaded an order from SAS in the past, and already have the SAS Download Manager, you might not need to get it again to retrieve a new order. You will be notified by your currently installed SAS Download Manager if you are required to get a newer version. Older versions are eventually retired in favor of new revisions, which better ensures the success and integrity of your downloaded content. The newest version of the SAS Download Manager can always be used to download all previous orders, in the event that you need to retrieve an earlier software order from SAS.

CHOOSING WHICH SAS DOWNLOAD MANAGER TO DOWNLOAD

You can choose to run the SAS Download Manager on a different machine, and different operating system,   than you are targeting for your SAS deployment.   For example, if you want to use a Windows PC to retrieve your software order and build a SAS Software Depot, you will use the SAS Download Manager for Windows.   You can use Windows to run the SAS Download Manager and coordinate the download even if you will be deploying SAS in a UNIX or mainframe environment.

The Web page for the SAS Download Manager provides general information, some important notes about what you can and cannot expect from your download experience, and links to versions of the program for a range of operating systems.   You only need to download one of these SAS Download Managers for any given computer.

http://www.sas.com/apps/demosdownloads/esdclient_PROD_sysdep.jsp?packageID=000388

Once you select which SAS Download Manager you need, you retrieve it from the SAS support site. Before you start the retrieval, you will need to accept the onlinelicense agreement for the SAS Download Manager. The process will deliver an installable package to your system. You will then need to run the install package to continue the SAS Download Manager installation process:

- If you download the SAS Download Manager for UNIX, you might have to make the installer executable before you are able to proceed.

- On a Windows Vista (or later release) operating system, you mightneed administrative privileges to install the SAS Download Manager.   If you encounter issues, right-click the esdclient.exe file and select **Run as administrator**. After the SAS Download Manager is installed, administrative privileges are no longer needed.

- Click through the pages of the SAS Download Manager installer, reviewing the information presented on each screen. After a few screens, you will start seeing a progress bar illustrating

the setup status.   Once the initial setup is complete, the SAS Download Manager will launch automatically.

- Select the language that you prefer for the SAS Download Manager interface in the first dialog box. Note that this language choice does not apply to the subsequent deployment of the SAS software. You will make additional choices when you run the SAS Deployment Wizard.

- You can proceed with downloading your SAS order. SAS recommends that you review the planning and preparation steps before retrieving your SAS order.   If you have not already completed the planning process, and you want to wait before you download a SAS order, select **Cancel** from the language selection dialog box. You can restart the SAS Download Manager later.

- You can remove the install package executable once you finish the setup and initial run of the SAS Download Manager.

- SAS recommends that you keep the SAS Download Manager installed for future use. After you have retrieved your SAS software order, however, you can uninstall the SAS Download Manager. On Windows, this can be done using the Add/Remove Programs Control Panel.   On UNIX, the SAS Download Manager can be removed by executing the following uninstall command, relative to the target directory to which the SAS Download Manager was installed:

  _uninstESD/UninstESD

  Note: To avoid locked files, if you choose to uninstall the SAS Download Manager, you should not have any shells running from the SAS Download Manager directory, and the SAS Deployment Manager should not be running.

EXECUTING THE DOWNLOAD PROCESS

The download process can be performed by a designated user who knows the order number, the download key, and the target download location.   Specific user permissions and considerations for the file location are discussed in the planning and preparing section of this document. SAS recommends that you use a standard user ID for downloading the software. At many sites, several people might perform the steps in the download and deployment processes.   The person who performs the download can be different than the person who plans the download. After the download is complete, some sites choose to have the software deployed by a different administrator. For this reason, SAS recommends that you store all information related to an order, including license files, deployment plans, and checklists, in the SAS Software Depot.

STARTING

You will run the SAS Download Manager on the system where it is installed, which might be a different location and operating system than what you will ultimately use for your SAS Deployment.   When you run the SAS Download Manager, you are starting the process for retrieving the files in your SAS order. The previous section of this paper describes retrieving and installing the SAS Download Manager. Follow one of these commands to start the SAS Download Manager:

- On Windows, from the Start menu, select SAS > SAS Download Manager.

- On UNIX, run esdclient.sh in the location where the SAS Download Manager was installed.

- On OpenVMS, run esdclient.exe in the location where the SAS Download Manager was installed.

- On z/OS, run esdclient.rexx in the location where the SAS Download Manager was installed.

- On Macintosh, select Applications > SAS > SAS Download Manager > Version > esdclient.

When the SAS Download Manager is started, you'll immediately be presented with a language selection dialog box. The purpose of this dialog box is not to discern what language of the software you wish to download, or ultimately deploy, but rather the language in which the pages of the SAS Download Manager should be displayed. Select the language in which you're most comfortable answering the prompts of the SAS Download Manager. The language you choose will have no bearing on the content that is retrieved in the download process.

The SAS Download Manager will attempt to contact the SAS ESD servers immediately after you answer the language prompt.   If the connection cannot be established, you might see dialog boxes requesting proxy server information, as described in the Firewalls section of this document. You cannot proceed until a connection is established with a SAS ESD server.

 Once the SAS Download Manager establishes contact with a SAS ESD server, you will see prompts for Order Information. On this page, enter the Order Number and SAS Installation Key as it appears in your Software Order E-mail (SOE).

TIP: You can copy both the order number and Installation key from the SOE in a single copy. Then you can issues a single paste command on the prompt in the SAS Download Manager. The paste function will parse the copied content and paste the information into the separate fields on the screen.

The SAS Download Manager displays a summary of what is included in the order that you are about to download after validating the Order Numberand the SAS Installation Key that you entered. Review the content of the order information to ensure that it contains what you expect. At this point, you can enter a Description value for this order.   SAS recommends that you enter a description to help you or your users identify this order when you are ready to deploy your SAS software or at other times when you are reviewing the content of the depot.   This description is available in the depotsummary.html file that is included at the root of the depot.

Next, you are asked to specify the SAS Software Depot directory. This directory can be a new directory or the location of an existing SAS Software Depot.   Ensure that the target location has sufficient space and that you have the required permissions to download the files.

You will get a final confirmation screen before the download process starts so that you can review your responses.   You also will be presented with metrics on how much space will be occupied in the target location.   At this point, you have three choices:

- Select **Back** to change the target destination for the SAS Software Depot.

- Select **Download** to start the download process.

- Select **CANCEL** to exit the download manager.

    o   If you exit the download after it starts, the SAS Download Manager suspends the download. The Order Number and SAS Installation Key is saved. The SAS Download Manager allows you to restart a suspended download session.

    o   If you exit before the download starts, the SAS Download Manager will end without keeping track of the order number or installation key.

NOTES ABOUT THE DOWNLOAD PROCESS

If you attempt to download and deploy multiple orders at the same time using the same SAS Software Depot, you can encounter lock conflicts. If you are retrieving multiple orders, a best practice is to download all orders before starting any SAS Deployments.

The download of SAS orders abide by the current export and import laws at the time the SAS order is downloaded:

- Due to changing export and import laws, an order mightbe restricted from being downloaded to certain locations.
- The SAS Download Manager will inform you if you cannot download an order due to these restrictions.

MONITORING

While the download process is running, the SAS Download Manager will display an updated estimate of the software that has been downloaded (or that is determined to already exist in the target depot).   The screen will also display an estimate of the average transfer speed so far.

If you see an error on the screen, you might need to restart the process. The download will resume at its last valid checkpoint. You will not need to redownload any files. Until you see a status message of **Finished**, the download process is not complete.

If you have problems, SAS Technical Support will be able to help examine log files. These are typically not referenced during a download. Because this is not a process that can be debugged by users, SAS does not provide reference information about these log files.

The SAS Download Manager process will indicate that is has completed by displaying a message on the screen. If the download screen is not available, you can inspect the depot with the SAS Deployment Wizard.   You should be able to identify the order that you have just downloaded and list the contents of that order.

In some cases, the download process can take more time than expected. This extended time is typically due to the automatic recovery from line transmission errors, or because there is a slow point in the overall line speed

COMPLETING

The SAS Download Manager will clean up after the transfer is complete.   This is a normal and necessary part of the download process. Unfortunately, on some systems, it might appear that the download process is hung. SAS recommends that you always allow the SAS Download Manager run until it displays the **Finished** message.

Once the download process is complete, you are ready to use the SAS Software Depot and proceed with deploying your SAS software.

REQUESTING SUPPORT

The electronic software delivery process is intended to simplify the retrieval and management of SAS software. There might be times, however, when you need to talk with SAS Technical Support representatives about the process. The SAS teams will request the following information when troubleshooting ESD questions:

- The Order Number and the SAS Installation Key which are in the Software Order E-mail.
- The SAS Deployment Wizard logs and preferences files. The preferences file, SDWPREFS.txt, is in the same location as the logs. With SAS Download Manager 1.4 and higher, the default location for the files is:
  On Windows: C:\Documents and Settings\<userid>\Local Settings\Application Data\SAS\SASDeploymentWizard\9.2.
  On UNIX: <userhome>/.SASAppData/SASDeploymehtWizard/9.2 .

- Additional information about the download process that mightbe helpful when debugging issues can be captured in the log file by taking the following steps:
    1. Restart the SAS Download Manager. Cancel the current session if it is already running.
    2. In the Choose Language window, select and release the **2** key on your keyboard. Then click **OK**.
    3. Click **Download** to continue the download process

USING THE SAS SOFTWARE DEPOT CREATED BY THE DOWNLOAD

Customers use the SAS Software Depot as a source when installing and configuring SAS software to make it accessible to end users. Whether you retrieve your SAS software electronically or load it from media, you will create a SAS Software Depot as a preparationstep in deploying your SAS software. That depot will then need to be handed off to the administrator who will install and configure SAS. If different people perform these tasks, ensure that permissions are set to enable the SAS installer account to access the SAS Software Depot.

RELATIONSHIP TO THE SAS DEPLOYMENT WIZARD

Starting with SAS 9.2, the SAS Deployment Wizard is the primary utility for deploying SAS software. This utility provides a consistent starting place to install and configure SAS software. It also provides options for managing and creating SAS Software Depots.   The SAS Download Manager is used only to manage the file transfer and to place downloaded software into a SAS Software Depot.

When you run the SAS Deployment Wizard from your SAS Software Depot, there are several high-level optionsrelated to the SAS Software Depot creation and management. Full instructions for running the SAS Deployment Wizard are available in the *SAS Deployment Wizard User'sGuide*, and in the *SAS Intelligence Platform: Installation and Configuration Guide*.   The following options create and manage the SAS Software Depot:

- Manage this SAS Software Depot
    - Modify the order description: During the initial download process, you mighthave specified descriptive notes.   You can update these notes using the SAS Deployment Wizard.
    - Delete an order: Deleting an order allows you to eliminate an order that you no longer wish to make available to other users. (It does not remove the installed software from your environment.)   If there are parts in the SAS Software Depot that are consumed only by the order being deleted, these parts will also be removed, thus freeing up space in your SAS Software Depot. However, if there are other orders that share some of these parts, those parts will not be deleted and space for this shared content will not be freed.
    - Create a Media-ready image: You canchoose to create media for distribution or backup purposes, The **Create Media-Ready Image** option allows you to create CDs or DVDs of the order selected.   The SAS Deployment Wizard formats and stages the media images in the specified directory. You will need to use system tools to write the media. Because the media-ready image is stored on disk, it is important to choose a target directory that has adequate space for the media-ready image and that is accessible by the media creation software that you intend to use. Media produced in this way will very closely resemble media delivered by SAS.

        A customer in a highly secure network environment could use this option to implement the sneaker-net approach. SAS recommends that you keep all orders in the main depot and that you extract the order that will be deployed to one or more specific servers.

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- Create or Add to a SAS Software Depot.
  - o When your software is delivered on media, you will use the SAS Deployment Wizard to create or update the SAS Software Depot. Once the depot is created (or updated), the SAS deployment process is the same, whether the software is delivered via media or via electronic download.
  - o Create a new depot based on the original depot: This facility is useful should you want to take one or more orders from a large SAS Software Depot and place a copy in an alternate location for deployment. You can also create a SAS Software Depot for personal or client users that contains a subset the SAS products for deployment to a specific audience. Details on depot management options are documented in the *SAS Deployment Wizard User's Guide*, and in the *SAS Intelligence Platform: Installation and Administration Guide.*

MOVING A SAS SOFTWARE DEPOT

In some cases, a customer must download a SAS order into a depot that is in a location that is different from where they would like it to ultimately reside. This could be due to performance constraints, security policies, or other site policies. SAS is mindful of this need and provides the following guidelines for moving a SAS Software Depot.

If the location to which you downloaded your order does not have network access to where you want it to reside, the recommended way to transfer your SAS Software Depot is to create physical media as described in the previous section. Once you've created media, you can carry that media to the target location, run the SAS Deployment Wizard from the first disk in the media set, and create a new SAS Software Depot.

If you have network access to the target location for the SAS Software Depot, you can copy the depot over the network. If a straight copy is possible, simply recursively copy the entire SAS Software Depot, being sure to preserve all files, file permissions, and timestamp information. When you use a mechanism such as SCP or FTP to move a SAS Software Depot, ensure that it ismoved exactly as it is. This means preserving timestamps, not altering file names or the file name casing, and ensuring appropriate permissions in the target location. For example, it is not sufficient to change the permission of the setup file (ie, setup.exe, setup.sh).   While there is no common way to do this on all hosts, usually creating a TAR of the SAS Software Depot, transferring that, and then extracting the archive does a good job of protecting everything from being augmented during the transfer.

Even after moving your SAS Software Depot to another location, it is recommended that you maintain your original SAS Software Depot. When the time comes to receive maintenance or place an add-on order, you will be able to significantly reduce your download time by specifying an existing SAS Software Depot as the target for downloading your new order. Should you delete the original SAS Software Depot, you'll either have to download future orders in full, or copy your SAS Software Depot back to a location that is directly accessible by the SAS Download Manager to reap these time benefits of downloading to an existing SAS Software Depot.

WHAT HAPPENS WITH AN ORDER WHEN YOU REQUEST ESD?

SAS prefers to deliver your software using Electronic Software Delivery. This method reduces delivery time as well as preserves resources. If electronic delivery is not a viable delivery method for you, you can request physical media delivery. Consult with your sales team if you have questions about the best delivery path for your site.

Electronic delivery is valid for orders of all types, with a variety of content:

- new orders
- add-on orders
- maintenance orders

Note: Renewal orders deliver a new license key only, and therefore cannot be used to electronically download your SAS order. With a renewal order, customers receive an e-mail with the updated SAS Installation Data file(s), and instructions for applying the license(s), but the software is not delivered with a renewal order. If you need a new copy of your software, you need to request a maintenance order.

The process for ordering software and requesting electronic delivery mirrors the process for placing any order with SAS. The only time you have to specify the media type is when you are placing a new order, or when you want to change the format in which your software is delivered. Here is an example:

The customer orders software from a SAS representative and requests electronic delivery.
→The SAS representative has the order created and tagged for electronic delivery.
→The customer downloads the order from scratch or into existing depot.
➔ The customer creates a new SAS deployment.

The customer wants to add a new license for their site.
→The SAS representative has a new order created.
(Electronic delivery is still selected, based on previous order.)
→ The customer downloads the new order
The SAS Download Manager downloads only items that are new in that order.
→ The customer upgrades an existing deployment with the newly licensed software.

Time passes. The customer wants to apply SAS maintenance to their site. The customer contacts SAS and places a maintenance order by using the self-service system or by working with a SAS representative.
→ The SAS representative (or self-service application) has a new order created.
(Electronic delivery is still selected, based on previous order.)
→ The customer downloads the new order.
The SAS Download Manager retrieves only items that are new in that order.
→ The customer upgrades an existing deployment with new versions of licensed software.

Some SAS orders, such as data set updates, contain unique product content and deployment instructions and are stored in a separate SAS Software Depot that cannot be shared with other orders. The SAS Download Manager will let you know if it is unable to save an order in an existing depot.

From the time a request for SAS software is placed with SAS, allow 5-7 business days to process the order and deliver the Software Order E-mail with the order information and the download (installation) keys. At that time, a customer could start the download process and begin building a SAS Software Depot. Additional time is required for the delivery of physical media. The amount of time that the media is in transit from SAS to the customer will vary based on local postal systems.

If you use the self-service application to request SAS software maintenance, your order will be designated for delivery using the same delivery path as the original order. That is: if the order was initially deliver electronically, then the maintenance will also be delivered electronically. You cannot use the self-service application if you want to change from media-delivery to electronic delivery of your software. You will need to contact your SAS account team directly to request this change.

FREQUENTLY ASKED QUESTIONS

This list addresses some typical questions asked about electronic software delivery.   Additional information is available in the documentation listed under Recommended Reading, and on the SAS support Web site.

1. Can I combine orders for SAS 9.2 and orders for SAS 9.1.3 in a single SAS Software Depot?
    a. No. The SAS Software Depot format was revised with the release of SAS 9.2. Starting with SAS 9.2, a single SAS Software Depot can contain multiple software orders delivered from SAS, including the originalorder, maintenance orders, and add-on orders.

2. Does the operating system of my SAS Software Depot need to be the same as the operating system where I will deploy SAS?
    a. No. The SAS Software Depot can contain files for various targetoperating systems.

3. Is there a default location for my SAS Software Depot?
    a. Yes, on Windows the default location for the SAS Software Depot is C:\SAS Software Depot.
    b. On UNIX and z/OS, SAS does not specify a default location. The SAS Download Manager will remember the previous value supplied by the user.

4. Where can I find the SAS Download Manager and additional information?
    a. Access the SAS support site for additional documentation and download files for the SAS Download Manager. On support.sas.com Web site, click the link **Downloads & Hot Fixes** from the left-hand menu. Once you are on the Hot Fixes and Downloads page, click the link **Administrator Services**.   When you access this site, you will need to log in and provide order information.

        Note: The SAS Download Manager will not work with Windows 2000 or Windows XP Home Edition. In order to install software on machines using those operating systems, install and run the SAS Download Manager on a machine using another operating system, then copy the downloaded package to your Windows 2000 or Windows XP Home Edition machine.

5. How can I confirm that a software order is complete? I am inspecting directories within the depot directory, and some pieces appear to be missing
    a. Use the SAS Deployment Wizard to inspect the depot. The SAS Deployment Wizard will display a list of orders that are available, and you can request that the content of a specific order be displayed. SAS reserves the right to change the format of the depot. Changing the content of a depot by modifying or deleting files can damage the integrity of the depot.

6. If I encounter errors when I start running the SAS Deployment Wizard, what should I check?
    a. You can start by searching the SAS support Web siteto determine if SAS knows about this problem and has a recommendation.   Use **electronic software delivery** as the search term. You can also refer to the *SAS Deployment Wizard User's Guide* for a basic deployment, or to the *SAS Intelligence Platform: Installation and Configuration Guide* for a planned deployment.

7. Why do I get an error when I try to retrieve my software order?
    a. You might have received a renewal order. Check your Software Order E-mail.   Renewal orders do not initiate a download because you already have the software, and a renewal order delivers only a license key (SID) that extends the use of your currently deployed SAS software.

8. What if I wanted to get updated software, and not just a license renewal?
    a. You must submit a maintenancerequest to initiate electronic delivery of the most current update of your licensed software. A self-service application for requesting maintenance is available from the administrative section of the SAS support Web site.

9. How many times can I download my order?
    a. SAS enables two downloads for most orders by default. The intent of the service is to provide a download to your company so you can install a copy of the SAS Software Depot on an internal server. You can then distribute from your server to the individual licensees. You can create media for distribution from the SAS Software Depot also. If your individual licensees try to download using ESD, you will encounter the error when the allotted number of downloads has been reached. The number of downloads allowed is subject to your number of licensed users or copies. If you need additional orders, or you have special requirements, please contact SAS. If you have exceeded your download count, you will see a message similar to the following:

```
Maximum number of downloads for this order has been exceeded.
Please contact SAS Technical Support for further assistance.
Refer to your software order e-mail for contract information.
```

CONCLUSION

Electronic software delivery from SAS transfers enterprise class software, and prepares it for deployment. Delivering SAS software electronically requires more administration than downloading a general purpose desktop application over the Web. The SAS process integrates encoding, compression, and restart checkpoints to facilitate the transfer of the enterprise software package.   SAS enabled the electronic delivery option in response to requests from customers to streamline the delivery processes and packaging.

SAS has designed deployment processes to integrate with the processes for retrieving your SAS software electronically.   You can automatically build a SAS software depot and keep your SAS software orders organized.   Optimize your software delivery process by reviewing your deployment goals, system pre-requisites, and your site security settings before starting the download.

This environmentally friendly process is the preferred delivery path for SAS software, and allows you to easily organize your SAS software orders. For customers who cannot use electronic software delivery, SAS provides software on physical media.

RECOMMENDED READING

- Announcement of ESD:
  http://support.sas.com/community/newsletters/news/feature/4q2007/esd.html

- Download site and SAS Download Manager documentation:

  o http://www.sas.com/software/distribution/readme/esdclient_PROD_/readme.pdf

  o Site: http://support.sas.com/adminservices/index.html   (SAS9 Software Administration)

- *SAS Deplpyment Wizard User's Guide (*includes information about SAS Software Depot):
  http://support.sas.com/documentation/installcenter/en/ikdeploywizug/62130/PDF/default/user.pdf

- *SAS Intelligence Platform: Installation and Configuration Guide* (depot info)
  http://support.sas.com/documentation/cdl/en/biig/60946/HTML/default/a003066997.htm#a003210 313

- SAS notes: Enter **electronic software delivery** as the search term on http://support.sas.com
  http://support.sas.com/dsearch?qt=electronic+software+delivery

CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the authors:

Gary Burchett
SAS Campus Drive
SAS Institute, Inc.
Gary.Burchett@sas.com

Brian Andrews
SAS Campus Drive
SAS Institute, Inc.
Brian.Andrews@sas.com

Donna Bennett
SAS Campus Drive
SAS Institute, Inc.
Donna.Bennett@sas.com