SAS® Visual Analytics 6.4
Installation and Configuration Guide

Also applies to
SAS® Visual Statistics

SAS® Documentation

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Contents

What's New

What's New in Installation and Configuration for SAS Visual Analytics 6.4

Overview

The *SAS Visual Analytics: Installation and Configuration Guide* explains how to install and initially configure SAS Visual Analytics.

This document contains new material on the following enhancements and changes to the SAS Visual Analytics deployment tools:

- Parallel data loads

Parallel Data Loads

Visual Analytics now supports self-service import actions from a configured, supported, remote data provider to a distributed SAS LASR Analytic Server.

For more information, see "Self-Service Import" in the *SAS Visual Analytics: Administration Guide*, available at `http://support.sas.com/documentation/onlinedoc/va/index.html`.

To enable this feature, you must deploy the SAS Embedded Process appropriate for your data store and configure the SAS High-Performance Analytic environment to set up the parallel connection.

For more information, see the *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide* available at **http://support.sas.com/documentation/solutions/hpainfrastructure/index.html**.

Recommended Reading

Here is the recommended reading list for this title:

- *Configuration Guide for SAS Foundation for Microsoft Windows for x64*, available at http://support.sas.com/documentation/installcenter/en/ikfdtnwx6cg/66385/PDF/default/config.pdf.
- *Configuration Guide for SAS Foundation for UNIX Environments*, available at http://support.sas.com/documentation/installcenter/en/ikfdtnunxcg/66380/PDF/default/config.pdf.
- *SAS Deployment Wizard and SAS Deployment Manager: User's Guide*, available at http://support.sas.com/documentation/installcenter/en/ikdeploywizug/66034/PDF/default/user.pdf.
- *SAS Guide to Software Updates*, available at http://support.sas.com/documentation/cdl/en/whatsdiff/66129/PDF/default/whatsdiff.pdf.
- *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide*, available at http://support.sas.com/documentation/solutions/hpainfrastructure/index.html.
- *SAS High-Performance Computing Management Console: User's Guide*, available at http://support.sas.com/documentation/solutions/hpainfrastructure/index.html.
- *SAS Intelligence Platform: Installation and Configuration Guide*, available at http://support.sas.com/documentation/cdl/en/biig/63852/PDF/default/biig.pdf.
- *SAS Intelligence Platform: Security Administration Guide*, available at http://support.sas.com/documentation/cdl/en/bisecag/67045/PDF/default/bisecag.pdf.

- *SAS LASR Analytic Server: Reference Guide* available at http://support.sas.com/documentation/onlinedoc/securedoc/index_lasrserver.html.
- *SAS Visual Analytics: Administration Guide* available at http://support.sas.com/documentation/onlinedoc/va/index.html.
- *SAS Visual Analytics: User's Guide* available at http://support.sas.com/documentation/cdl/en/vaug/67270/PDF/default/vaug.pdf.
- Help and tutorials integrated into SAS Mobile BI.
- SAS offers instructor-led training and self-paced e-learning courses to help you administer SAS Visual Analytics. For more information about the courses available, see support.sas.com/admintraining.

For a complete list of SAS books, go to support.sas.com/bookstore. If you have questions about which titles you need, please contact a SAS Book Sales Representative:

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Introduction to Deploying SAS Visual Analytics

What Is SAS Visual Analytics?

SAS Visual Analytics is an easy-to-use, web-based product that leverages SAS high-performance computing technologies and empowers organizations to explore huge volumes of data very quickly in order to identify patterns, trends, and opportunities for further analysis.

SAS Visual Analytics consists of the following components:

- A *non-distributed* SAS LASR Analytic Server.

  Or, a *distributed* SAS LASR Analytic Server consisting of SAS High-Performance Analytics environment root and worker nodes.
- One of the supported co-located data providers (distributed):
  - EMC Greenplum Data Computing Appliance
  - SAS High-Performance Deployment of Hadoop cluster
  - Other, supported Hadoop cluster
- A SAS Visual Analytics server tier consisting of the following:
  - SAS LASR Analytic Server Monitor (distributed)
  - SAS Visual Analytics High-Performance Configuration
  - SAS Information Retrieval Studio
  - SAS Workspace Servers
  - SAS Pooled Workspace Servers
  - SAS Stored Process Servers
  - SAS/ACCESS
  - SAS High-Performance Computing Management Console (distributed)
- A SAS Visual Analytics middle tier consisting of the following:

- SAS Visual Analytics Hub
- SAS Visual Analytics Explorer
- SAS Visual Analytics Designer
- SAS Visual Data Builder
- SAS Visual Graph Builder
- SAS Visual Analytics Report Viewer
- SAS Visual Analytics Administrator
- LASR Authorization Service
- SAS Visual Analytics Transport Service
- Search Interface to SAS Content
- SAS Remote Services

When you license SAS Visual Analytics with the non-distributed SAS LASR Analytic Server, the SAS High-Performance Analytics environment and the co-located data providers are absent.

For more information about SAS Visual Analytics, refer to the following documents:

- *SAS LASR Analytic Server: Reference Guide*, available at `http://support.sas.com/documentation/onlinedoc/securedoc/index_lasrserver.html`
- *SAS Visual Analytics: Administration Guide*, available at `http://support.sas.com/documentation/onlinedoc/va/`
- *SAS Visual Analytics: User's Guide*, available at `http://support.sas.com/documentation/cdl/en/vaug/67270/PDF/default/vaug.pdf`
- Help and tutorials integrated into the SAS Mobile BI application.

What Is Covered in This Document?

This document covers tasks that are required after you and your SAS representative have decided what software you need and on what machines you will install the software. At this point, you can begin performing some pre-installation tasks, such as creating operating system user accounts and designating the ports that you will use during installation.

Because so much of the installation process is similar to the SAS Intelligence Platform, this document is designed to be used with the *SAS Intelligence Platform: Installation and Configuration Guide*, available at `http://support.sas.com/documentation/cdl/en/biig/63852/PDF/default/biig.pdf`.

Unless you are deploying a non-distributed SAS LASR Analytic Server, you will also need to refer to *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide*, available at `http://support.sas.com/documentation/onlinedoc/va`.

Where Do I Locate My Analytics Cluster?

Overview of Locating Your Analytics Cluster

If you are planning to use a distributed SAS LASR Analytic Server, then you need to establish an *analytics cluster*. An analytics cluster is a high-performance environment that is characterized by massively parallel processing (MPP) used to perform analytic tasks on big data residing in a distributed data storage appliance or Hadoop cluster.

You have two options for where you locate your SAS analytics cluster:

- co-locate with your data store
- remote from your data store

When the SAS analytics cluster is separated (remote) from your data store, you have two basic options for data transfer:

- serial data transfer using SAS/ACCESS.
- parallel data transfer using SAS/ACCESS in conjunction with the SAS Embedded Process.

The topics in this section contain basic diagrams that describe each option for analytic cluster placement:

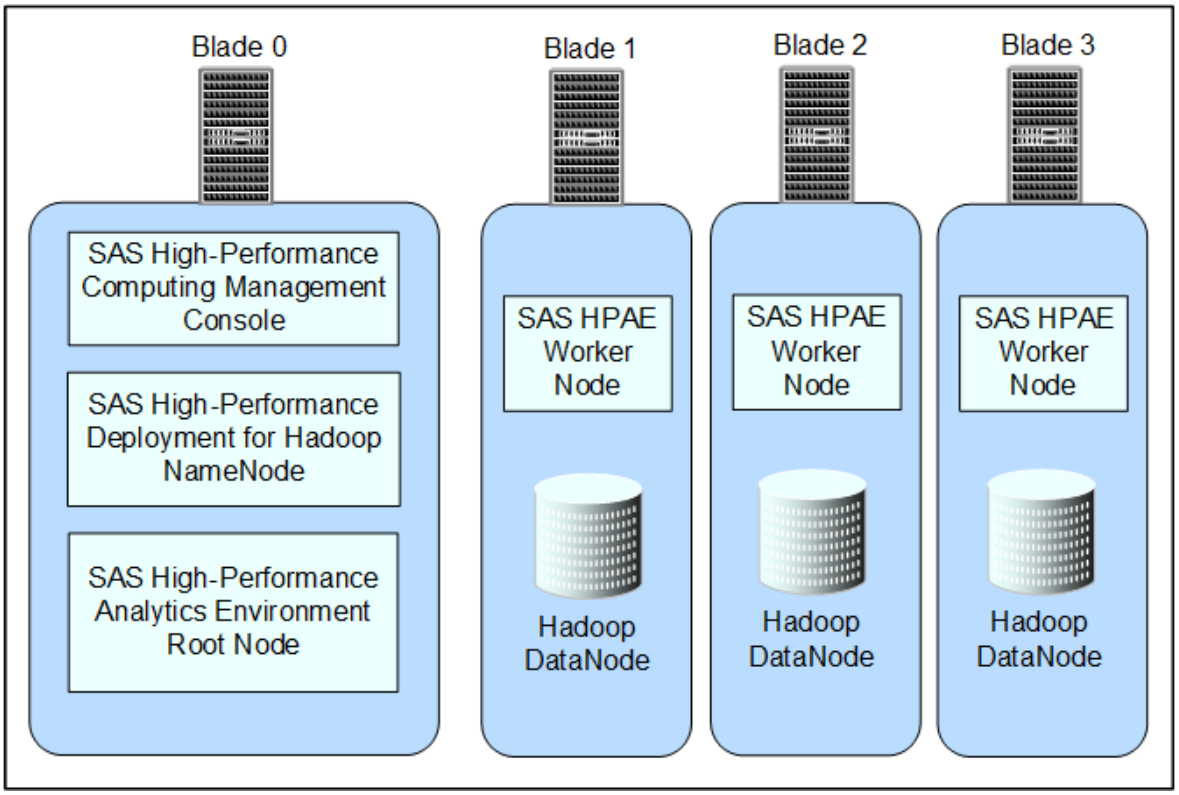
- co-located with the data store
  - SAS Hadoop cluster
  - other supported Hadoop cluster
  - Greenplum data appliance
- remote from your data store
  - SAS Hadoop (serial)
  - other supported Hadoop (serial)
  - Greenplum (serial)
  - SAS Hadoop (parallel)
  - other supported Hadoop (parallel)
  - Greenplum (parallel)

Where you locate your cluster depends on a number of criteria. Your SAS representative will know the latest supported configurations, and can work with you to help you determine which cluster placement option works best for your site.

Co-located with Your Data Store

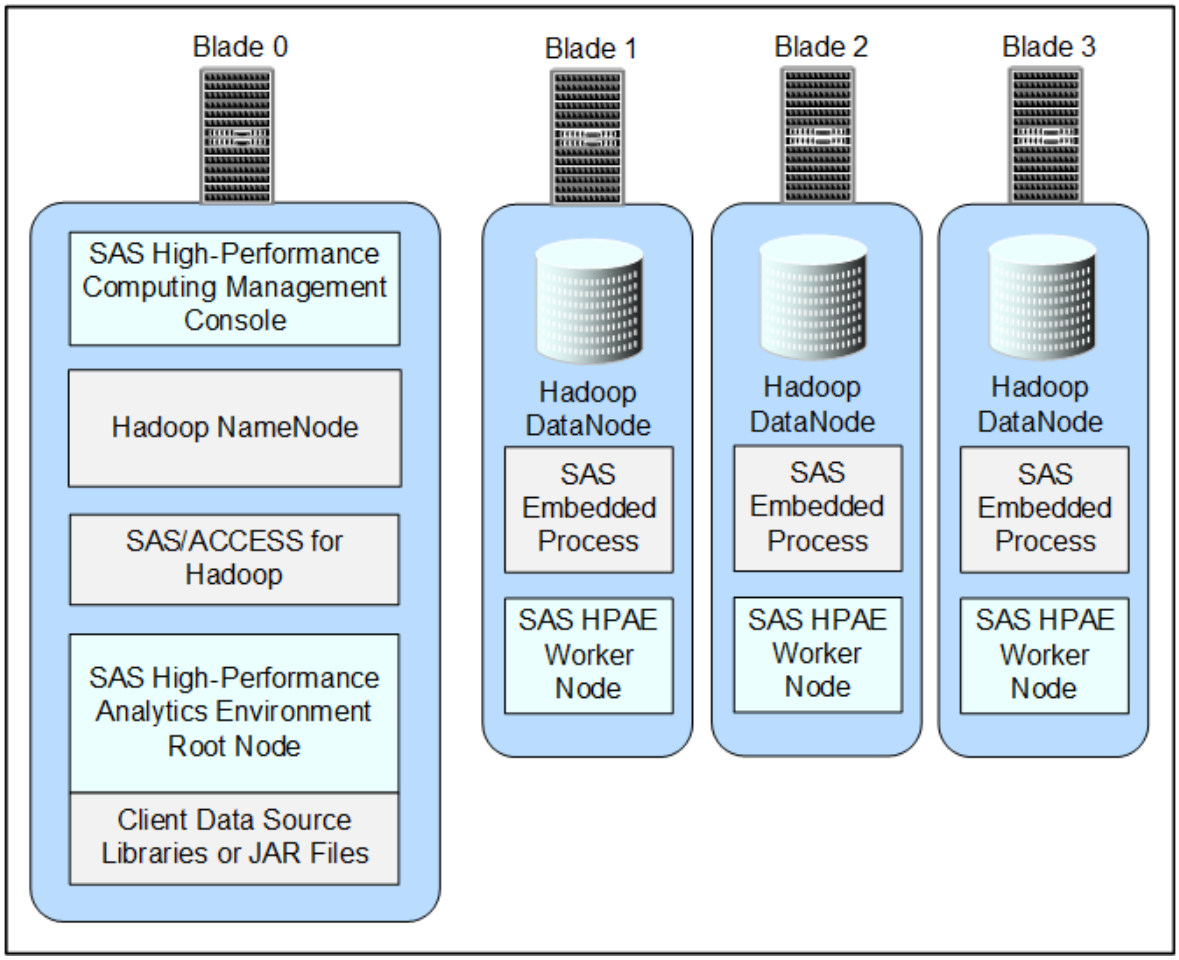
The following figure shows the analytics cluster co-located on your SAS High-Performance for Hadoop cluster:

Figure 1.1 *Analytics Cluster Co-located on the SAS High-Performance for Hadoop Cluster*



The following figure shows the analytics cluster co-located on your supported Hadoop cluster:

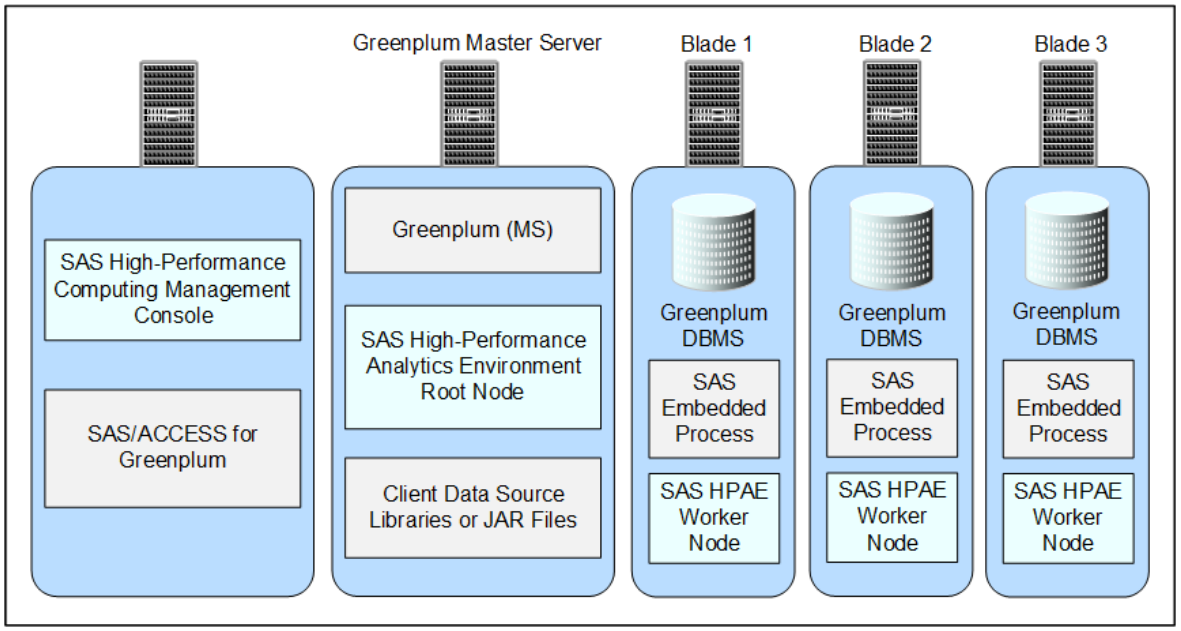
Figure 1.2 *Analytics Cluster Co-located on Your Supported Hadoop Cluster*



Note: For deployments that access SASHDAT tables exclusively, SAS/ACCESS and the SAS Embedded Process are not required.

The following figure shows the analytics cluster co-located on your Greenplum data appliance:

Figure 1.3 *Analytics Cluster Co-located on Your Greenplum Data Appliance*

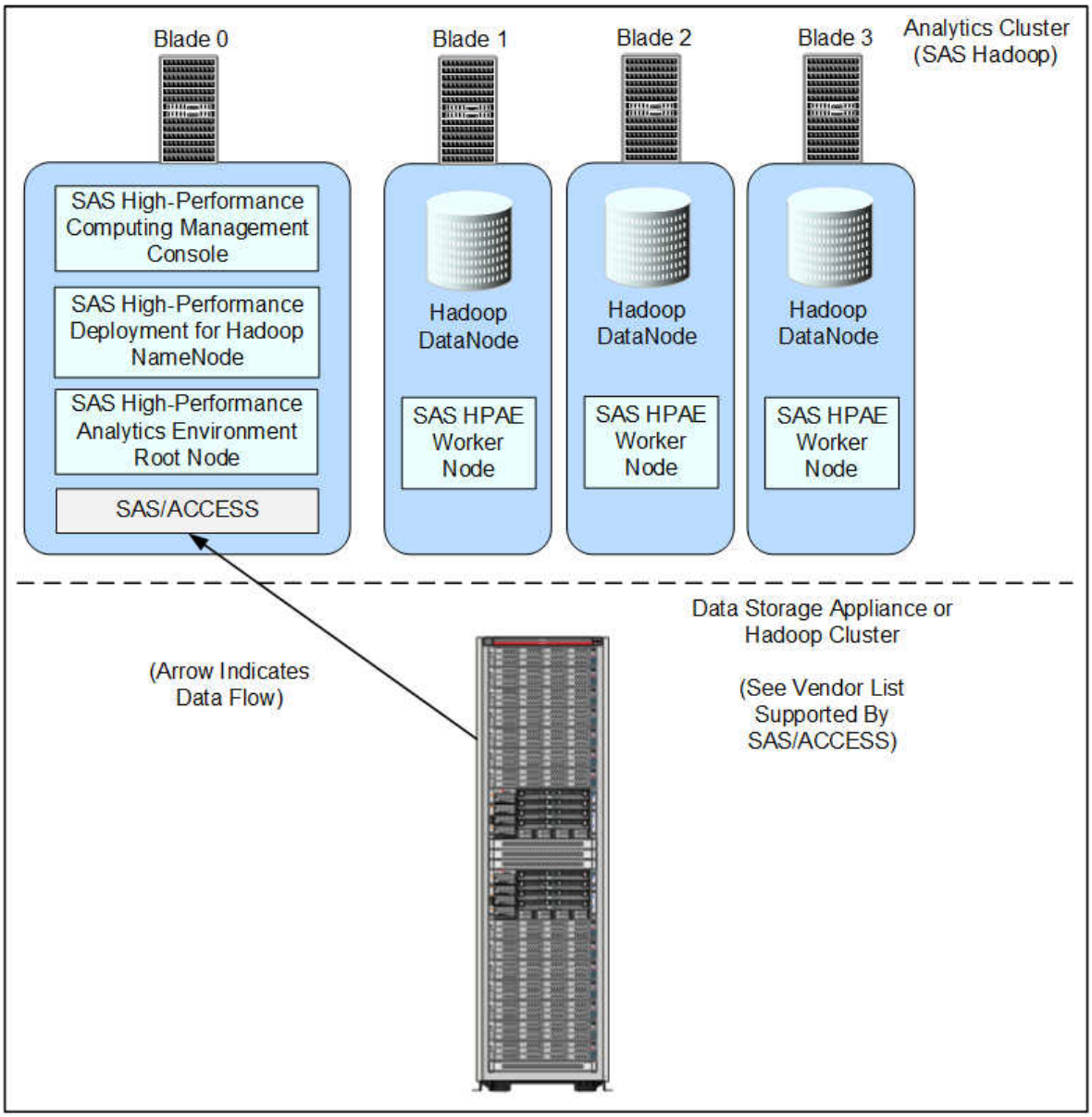


Remote from Your Data Store (Serial Connection)

The serial connection between the analytics cluster and your data store is achieved by using the SAS/ACCESS Interface. SAS/ACCESS is orderable in a deployment package that is specific for your data source. For more information, refer to the *SAS/ACCESS for Relational Databases: Reference*, available at `http://support.sas.com/documentation/onlinedoc/access/`.

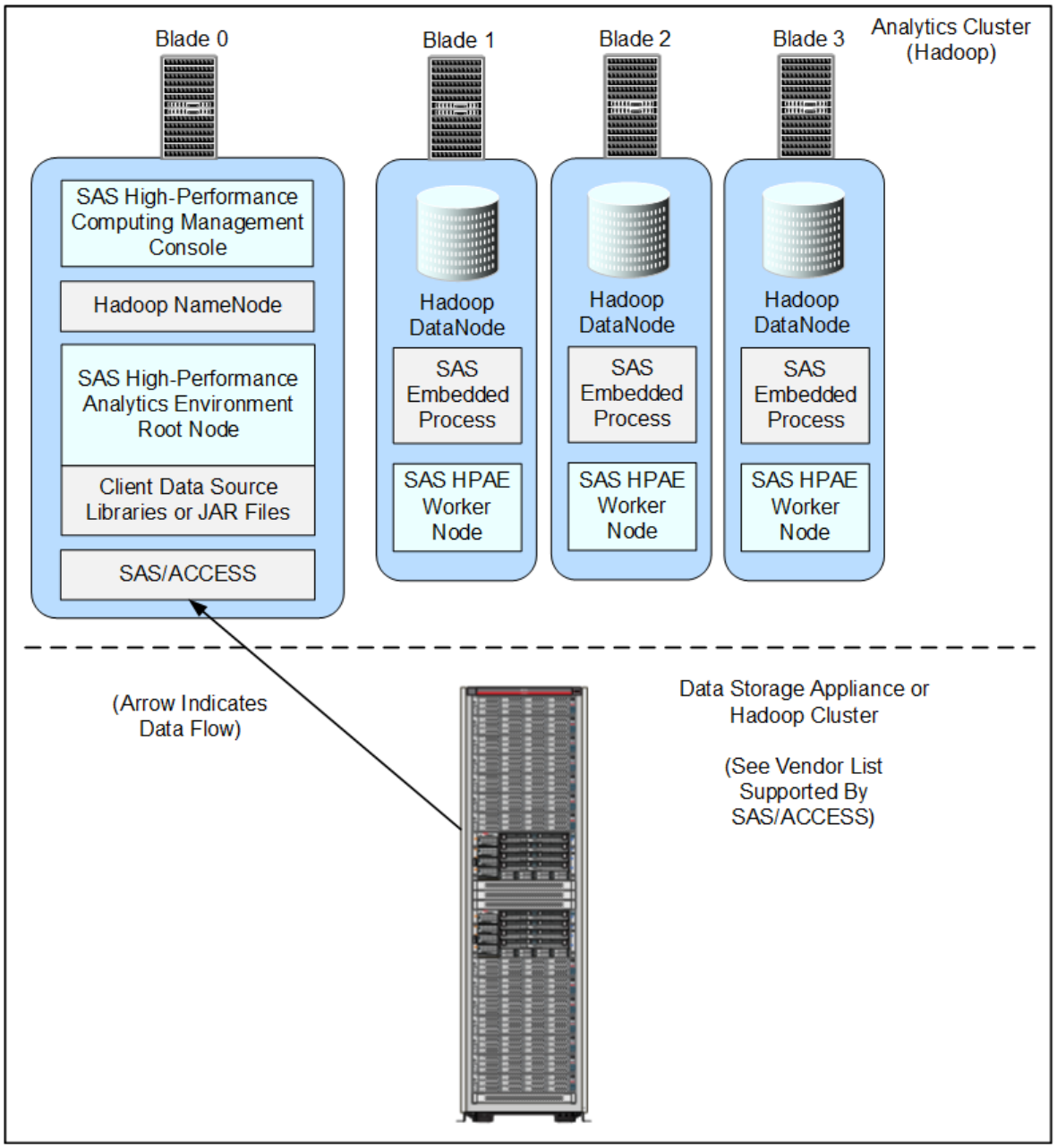
The following figure shows the analytics cluster running the SAS High-Performance Deployment for Hadoop using a serial connection to your remote data store:

Figure 1.4 *Analytics Cluster (SAS Hadoop) Remote from Your Data Store (Serial Connection)*



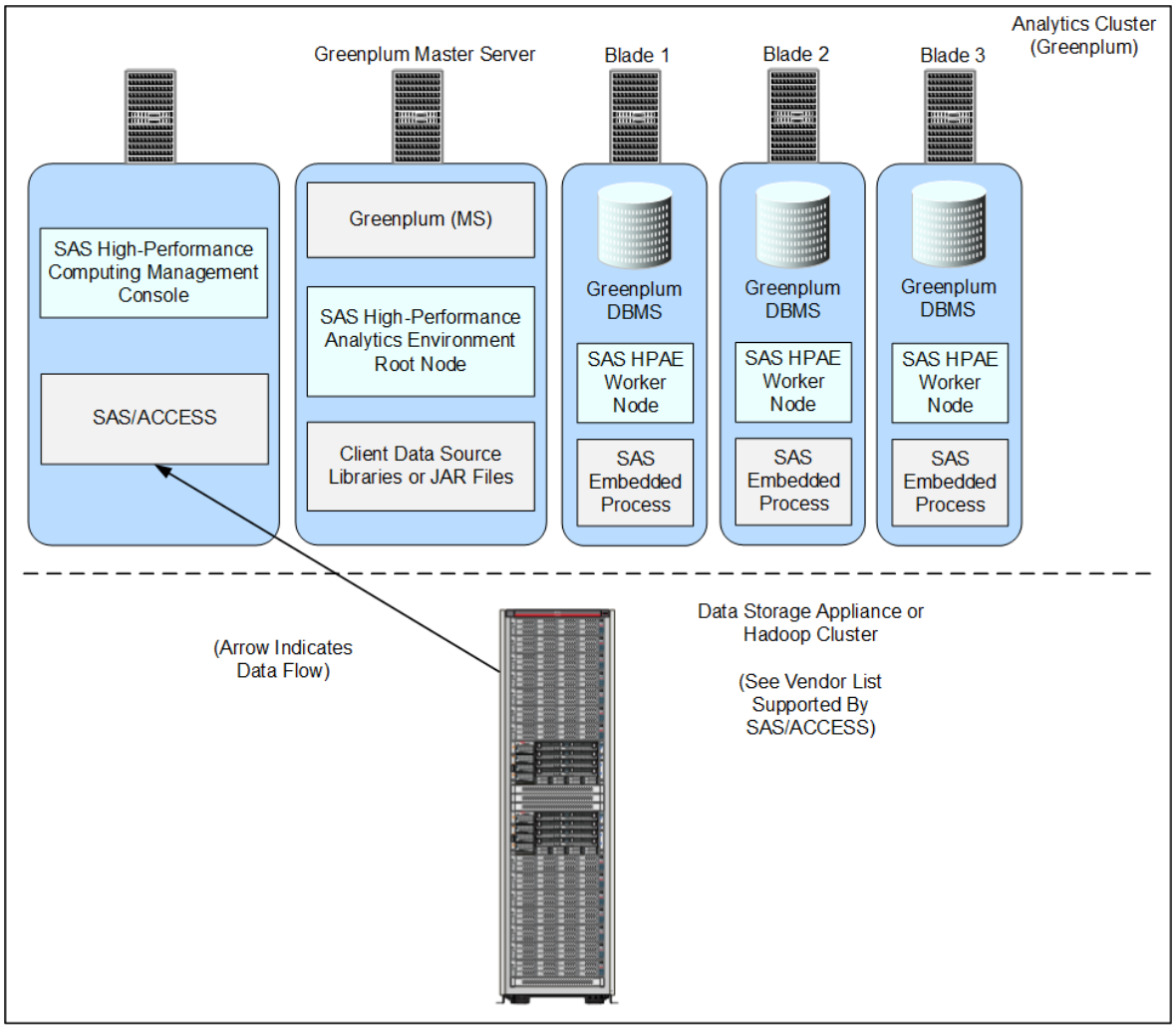
The following figure shows the analytics cluster running on your supported Hadoop cluster using a serial connection to your remote data store:

Figure 1.5 *Analytics Cluster (Hadoop) Remote from Your Data Store (Serial Connection)*



The following figure shows the analytics cluster running on your Greenplum data appliance using a serial connection to your remote data store:

Figure 1.6 *Analytics Cluster (Greenplum) Remote from Your Data Store (Serial Connection)*



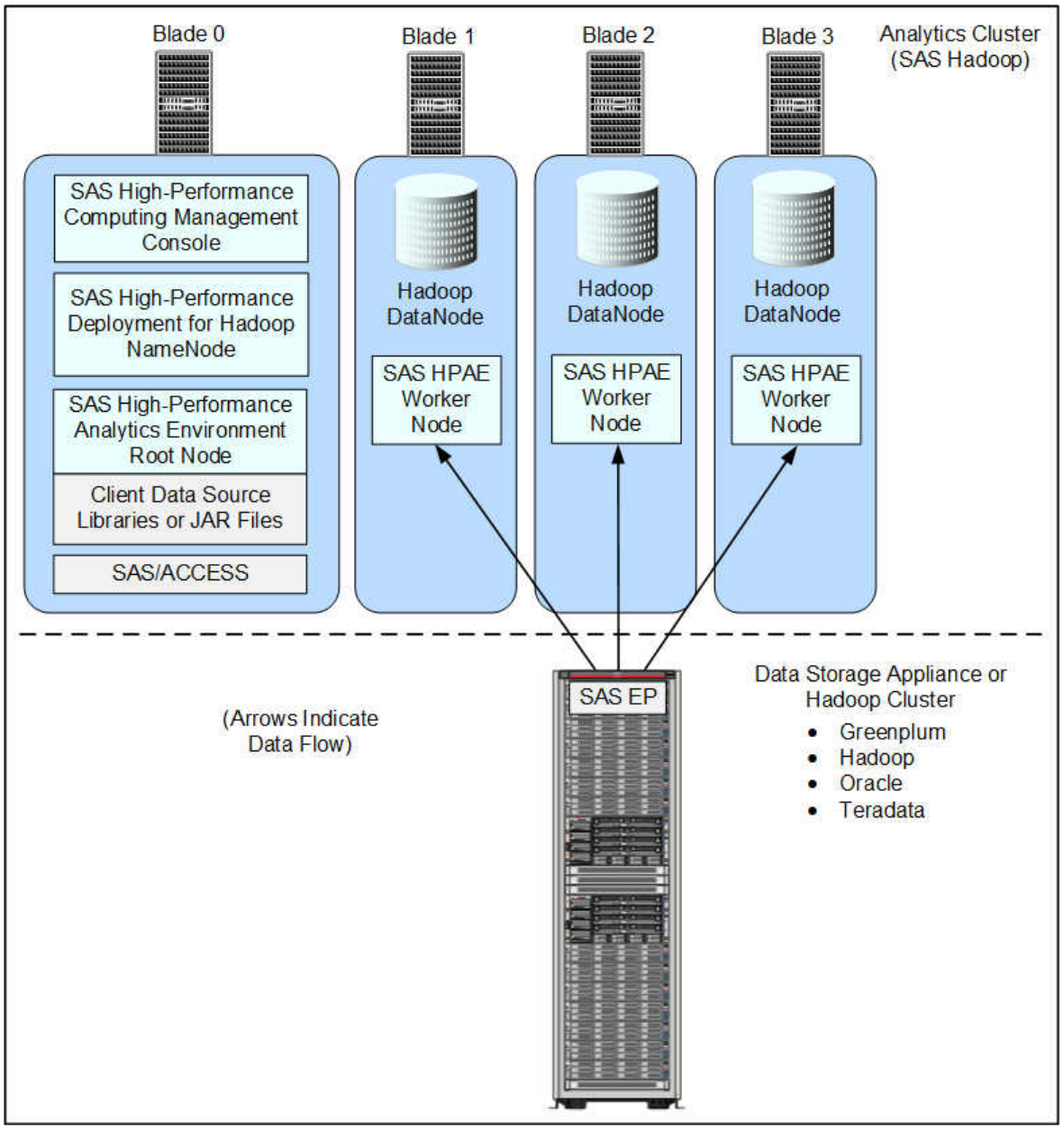
Remote from Your Data Store (Parallel Connection)

Together, the SAS/ACCESS Interface and SAS Embedded Process provide a high-speed parallel connection that delivers data from your data source to the SAS-High

Performance Analytics environment on the analytic cluster. These components are contained in a deployment package that is specific for your data source. For more information, refer to the *SAS In-Database Products: Administrator's Guide*, available at **http://support.sas.com/documentation/onlinedoc/indbtech/**.

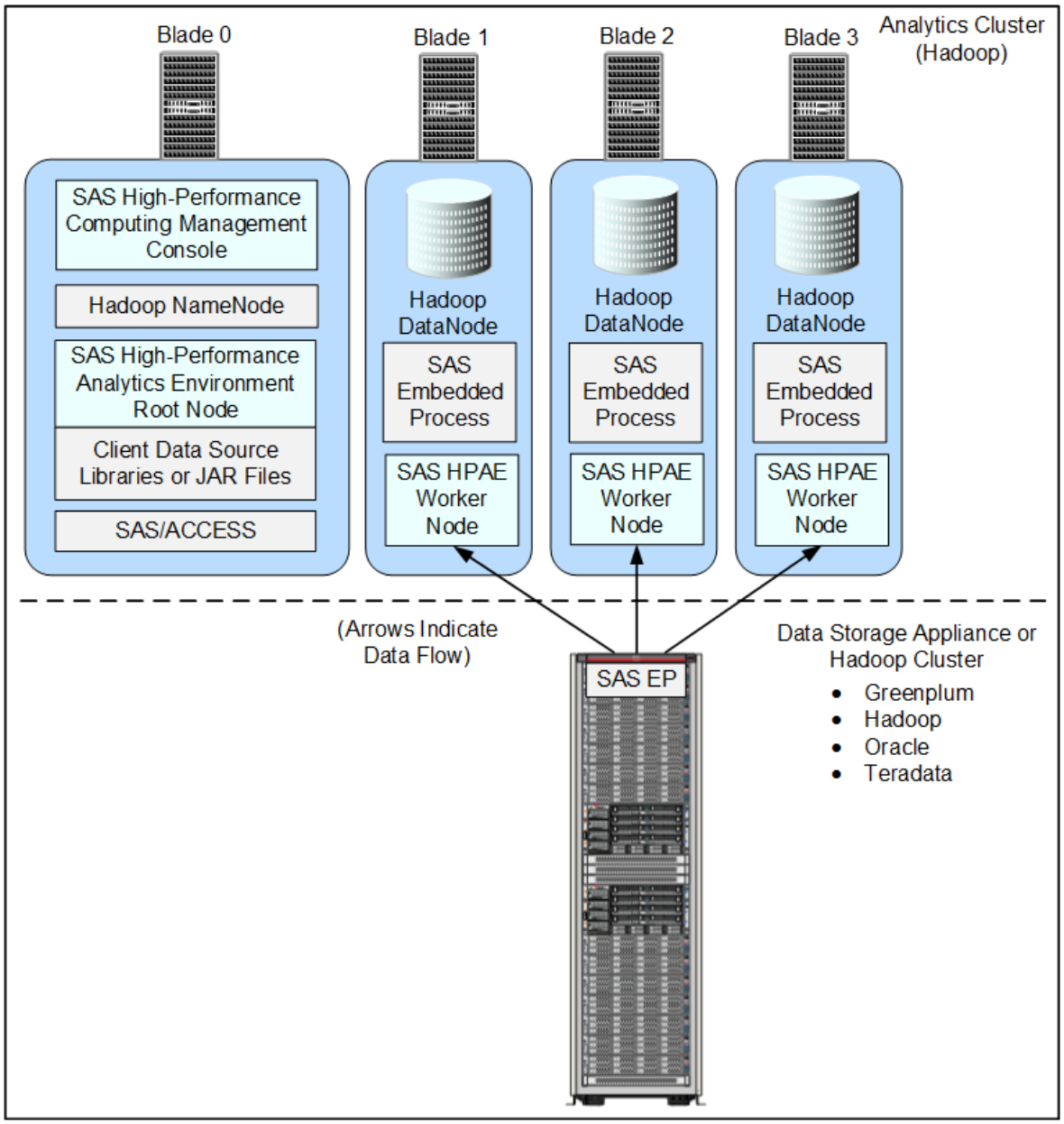
The following figure shows the analytics cluster running the SAS High-Performance Deployment for Hadoop using a parallel connection to your remote data store:

Figure 1.7 *Analytics Cluster (SAS Hadoop) Remote from Your Data Store (Parallel Connection)*



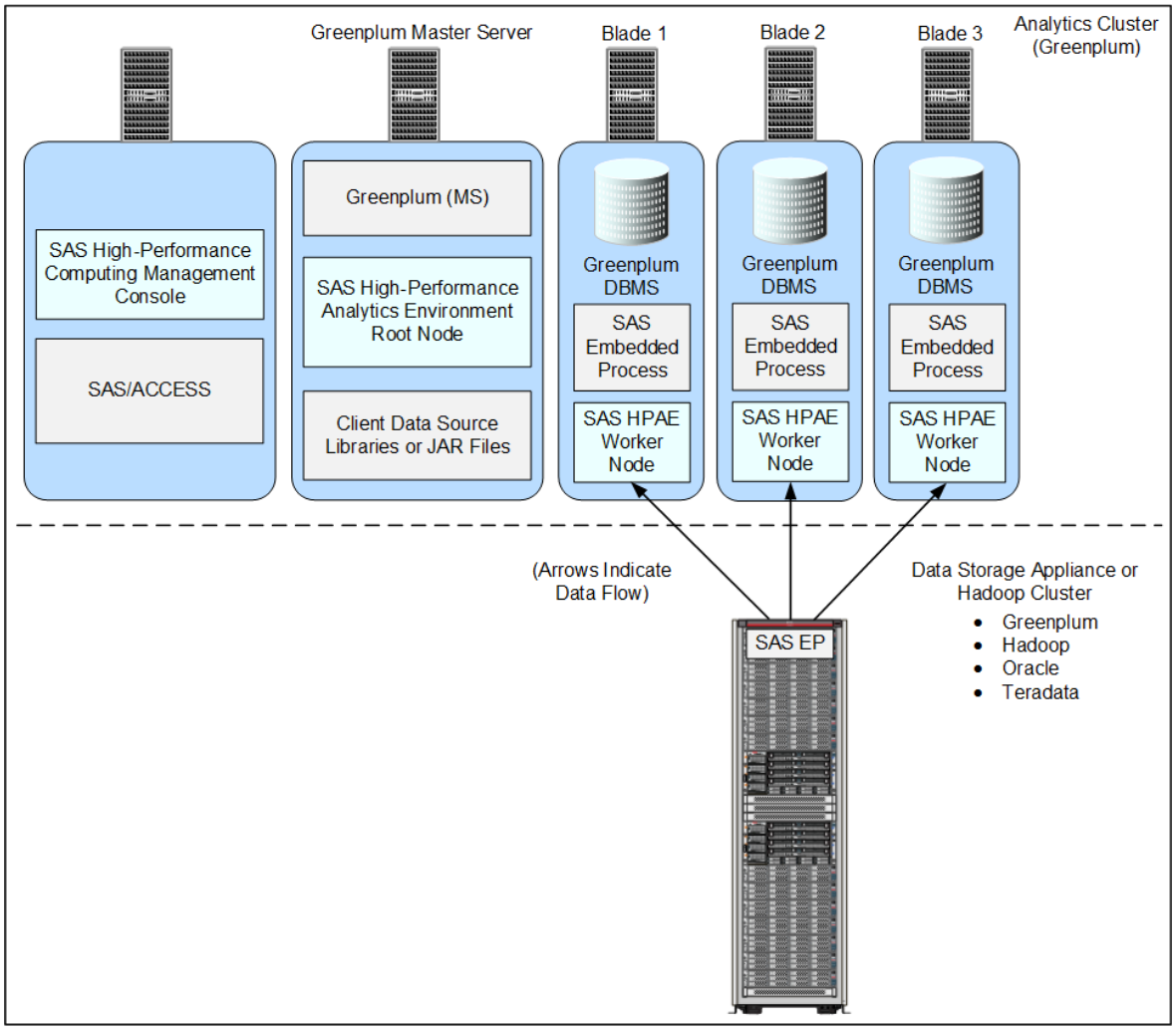
The following figure shows the analytics cluster running on your supported Hadoop cluster using a parallel connection to your remote data store:

Figure 1.8 *Analytics Cluster (Hadoop) Remote from Your Data Store (Parallel Connection)*



The following figure shows the analytics cluster running on your Greenplum data appliance using a parallel connection to your remote data store:

Figure 1.9 *Analytics Cluster (Greenplum) Remote from Your Data Store (Parallel Connection)*



Deploying SAS Visual Analytics

Overview of Deploying SAS Visual Analytics

The following list summarizes the steps required to install and configure SAS Visual Analytics:

1. Create a SAS Software Depot.
2. Check for documentation updates.
3. (Optional) Deploy the SAS High-Performance Analytics infrastructure.
4. Create operating system users and groups and designate ports.
5. Deploy required third-party software.
6. Deploy the servers and middle tier.

The following sections provide a brief description of each of these steps. Subsequent chapters in the guide provide the step-by-step instructions that you will need to perform them.

Step 1: Create a SAS Software Depot

Create a SAS Software Depot, which enables you to install the SAS software over your site's network rather than from the installation media.

Note: If you have elected to receive SAS through Electronic Software Delivery, a SAS Software Depot is automatically created for you.

For more information, see “Creating a SAS Software Depot” in the *SAS Intelligence Platform: Installation and Configuration Guide*, available at `http://support.sas.com/documentation/cdl/en/biig/63852/PDF/default/biig.pdf`.

Step 2: Check for Documentation Updates

It is very important to check for late-breaking installation information in SAS Notes and also to review the system requirements for your SAS software.

- SAS Notes

  Go to this web page and click **Outstanding Alert Status Installation Problems**:

  http://support.sas.com/notes/.

- system requirements

  - *System Requirements—SAS Visual Analytics (Distributed Mode)*, available at http://support.sas.com/documentation/installcenter/en/ikvisanlytofrsr/67467/HTML/default/
  - *System Requirements—SAS Visual Analytics (Non-distributed Mode)*, available at http://support.sas.com/documentation/installcenter/en/ikvisanlytofrndmsr/67468/HTML/default/

Step 3: (Optional) Deploy the SAS High-Performance Analytics Infrastructure

Note: This step is not required when deploying a non-distributed SAS LASR Analytic Server.

The SAS High-Performance Analytics infrastructure consists of the following:

- SAS High-Performance Analytics environment

  is the foundation for SAS LASR Analytic Server. A root node is deployed on the grid host and worker nodes on each remaining machine in the Hadoop cluster or Greenplum data appliance.

- SAS High-Performance Computing Management Console

  is a web application tool that eases the administrative burden on multiple machines in a distributed computing environment.

- SAS High-Performance Deployment of Hadoop (optional)

is a co-located data provider. This version of SAS Hadoop is based on Apache and is shipped with SAS. The NameNode is deployed on the grid host and DataNodes on each remaining machine in the cluster.

Note: Use of SAS Hadoop is optional. Greenplum appliances and other supported Hadoop clusters can be used in lieu of SAS Hadoop.

For information about deploying the SAS High-Performance Analytics infrastructure, refer to the *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide*, available at `http://support.sas.com/documentation/solutions/hpainfrastructure/`.

Step 4: Create Operating System Users and Groups and Designate Ports

Create a set of operating system users and groups that will be required during the installation and configuration of your system, and designate a set of ports to use.

SAS Visual Analytics users must have an operating system account and for distributed environments, passwordless secure shell (SSH) on all machines in the cluster or on blades across the appliance. SAS High-Performance Computing Management Console enables you to perform these two tasks from one location.

For more information, see Chapter 2, “Setting Up Users, Groups, and Ports,” on page 21.

Step 5: Deploy Required Third-Party Software

Install any third-party products, such as Python, that are necessary for your installation. These products are identified in your deployment plan.

For more information, see:

- *System Requirements—SAS Visual Analytics (Distributed Mode)*, available at `http://support.sas.com/documentation/installcenter/en/ikvisanlytofrsr/67467/HTML/default/`

- *System Requirements—SAS Visual Analytics (Non-distributed Mode)*, available at `http://support.sas.com/documentation/installcenter/en/ikvisanlytofrndmsr/67468/HTML/default/`

See also the SAS 9.4 third-party support site located at `http://support.sas.com/resources/thirdpartysupport/v94`.

Step 6: Deploy the Servers and Middle Tier

Having identified the proper deployment plan for your order, install and configure your SAS LASR Analytic Server, SAS Visual Analytics server, and SAS Visual Analytics middle-tier software using the SAS Deployment Wizard. The deployment wizard is an installation and configuration tool that is supplied by SAS.

For more information, see Chapter 3, “Deploying the SAS Visual Analytics Server and Middle Tier,” on page 41.

2

Setting Up Users, Groups, and Ports

Overview of Users, Groups, and Ports

Before you begin installing and configuring your software, you must create a set of required users and groups at the operating-system level, and you must designate a set of TCP/IP ports for the servers to use. This is the fourth of six tasks required to install and configure SAS Visual Analytics.

1. Create a SAS Software Depot.
2. Check for documentation updates.
3. (Optional) Deploy the SAS High-Performance Analytics infrastructure.
4. **Create operating system users and groups and designate ports.**
5. Deploy required third-party software.
6. Deploy the servers and middle tier.

Defining User Accounts

Overview of Defining User Accounts

There are two types of user accounts to understand when deploying SAS:

- *Internal user accounts* are accounts known only to SAS and are created and authenticated internally in metadata rather than externally.
- *External user accounts* are user accounts defined outside of SAS metadata. These accounts are local to a machine or are defined in a network directory service of which the machine is a member, such as LDAP.

The following sections describe the user accounts that SAS and third-party software require, and provide information to help you answer these questions:

- What are internal and external user accounts?

- What user rights or to what groups must each account be assigned?
- What password policies should I enforce?

Controlling User Access to Hosts

SAS Visual Analytics uses passwordless secure shell (SSH) for access to the machines in the cluster. The following list identifies some of the requirements for configuring passwordless SSH to enable access:

- Data administrators must configure their user accounts for passwordless SSH in order to start and stop SAS LASR Analytic Server instances. It is also needed for loading and unloading tables to server instances. For more information, see *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide*, available at `http://support.sas.com/documentation/solutions/hpainfrastructure/index.html`.
- User accounts that are used as shared logins for group access to data must be configured for passwordless SSH. For more information, see *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide*, available at `http://support.sas.com/documentation/solutions/hpainfrastructure/index.html`.

To reduce the number of operating system (external) accounts, it can be convenient to use the SAS Installer account for running SAS LASR Analytic Server Monitor. Although not required, it is useful to create a first user (sasdemo) account to do a simple validation of your deployment after installation and initial configuration. For more information, see *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide*, available at `http://support.sas.com/documentation/solutions/hpainfrastructure/index.html`.

Internal User Accounts

Internal user accounts are accounts known only to SAS and are created and authenticated internally in metadata rather than externally. SAS identifies internal accounts by appending a special string to the user ID. This string begins with an at sign (@) and contains *saspw*: `@saspw`. For two of the required user accounts, the SAS

Administrator and the SAS Trusted User, the SAS Deployment Wizard prompts you by default to create *internal* user accounts.

The following table shows the default internal user accounts required by SAS. (SAS internal accounts are authenticated on the metadata server.)

Table 2.1 *SAS Internal User Accounts*

Description	User ID
SAS Administrator— The user account with privileges associated with the SAS Metadata Unrestricted Users role.	sasadm@saspw
SAS Trusted User— The user account that can impersonate other users on connections to the metadata server. Some SAS processes use this account to communicate with the metadata server on a client's behalf.	sastrust@saspw
SAS Environment Manager service account— The user account that the SAS Environment Manager and its agent use to communicate while monitoring the processes in your SAS deployment. This internal SAS account has unrestricted administrative access rights to the metadata server. For more information, see “SAS Environment Manager and SAS Metadata Users” in Chapter 9 of *SAS Environment Manager: User's Guide*.	sasevs@saspw
SAS Anonymous Web User— An optional user account that is used to grant clients access to applicable SAS Web Infrastructure Platform components. When web clients request access to web services, they are not prompted for credentials but instead are granted access under this user account.	webanon@saspw
Search Interface to SAS Content User— The user account that permits access to SAS content that is supplied to SAS Information Retrieval Studio for indexing.	sassearch@saspw

For more information about SAS internal user accounts and their purposes, see Chapter 2, “Understanding the State of Your System,” in *SAS Intelligence Platform: System Administration Guide*.

Here are some benefits of internal accounts:

- less maintenance.

  The account is defined only once in SAS, and you do *not* define this account externally using the authentication provider.

- isolation from the host machine security policy.

  The SAS Administrator and the SAS Trusted User credentials are referenced in many locations within SAS. For example, forcing a recurring password change (a common security policy) might make unnecessary work for the person administering SAS.

- independence from IT.

  You can create additional SAS unrestricted user and administrative user accounts for metadata management without involvement of your IT department.

- reduced “headless” external user accounts.

  The SAS Trusted User is an account used for SAS inter-process communication, and it will not be mistaken for a human user.

- minimal security exposure to your enterprise.

  The SAS Administrator and the SAS Trusted User are highly privileged accounts and provide access only to SAS—not to operating system resources.

Required External User Accounts for SAS

External user accounts are user accounts defined outside of SAS metadata. These accounts are local to a machine or are defined in a network directory service of which the machine is a member, such as LDAP. SAS requires certain *external* user accounts for two purposes: installation and running certain SAS server processes.

During installation and configuration, the SAS Deployment Wizard must run under an external account with the necessary privileges on the target machine to write SAS program and log files. To run servers such as the stored process server and the pooled workspace server, SAS requires an external user account to be the server process

owner. For more information about external user accounts and their purposes, see the *SAS Intelligence Platform: System Administration Guide*.

Although it is not required, you might find it helpful to create a *SAS First User account* with which to test a typical user's ability to access various SAS applications and to validate your deployment. (A SAS First User account is sometimes referred to as the SAS Demo account.) The SAS Deployment Wizard asks you if you want to create a SAS First User account in SAS metadata, and you must have an external operating system account available for this purpose. After the wizard finishes, remember that you must add this SAS user to the Visual Analytics Data Administrators Group. For more information, see "Create SAS Users and Groups" on page 105.

As you set up external accounts, remember to use different external accounts for the SAS First User and the SAS Spawned Servers accounts. Otherwise, your configuration will generate errors and the SAS Pooled Workspace Server will not be functional.

As you create these external user accounts, record information about them in "Pre-installation Checklist for External User Accounts for SAS Visual Analytics" on page 28. You will need this information when you run the SAS Deployment Wizard later.

The following table shows external user accounts required by SAS and the machines on which they are authenticated.

Table 2.2 *Required External User Accounts for SAS*

Description	Recommended User ID	Machine Where Authenticated
SAS Installer— Used to install SAS, start the SAS LASR Analytic Server Monitor.	sas	Every machine
SAS Hadoop User— Starts Hadoop on the machines in the cluster. (Created by the SAS Visual Analytics Hadoop configuration script—the **`hdpsetup`** command.)	hadoop	
SAS Spawned Servers account— The process owner for stored process servers and pooled workspace servers.	sassrv	Stored process server Pooled workspace server

Note:

- For information about the user rights that each external account requires, see "Rights Required by External User Accounts for SAS" on page 27.
- The SAS Installer generally overrides the default configuration directory with the site's preferred location (for example, `/opt/sas/config`). The installer must have Write permission on this path.
- Do not use root for the SAS Installer user ID.

Rights Required by External User Accounts for SAS

Operating systems require that you assign certain rights to the external user accounts used to deploy and to run SAS.

The following table describes the user rights needed by the required external user accounts to deploy and run SAS.

Table 2.3 *Rights Required by External User Accounts for SAS*

External User Account	User Rights Needed
SAS Installer	The group that you designate as the *primary* group for the SAS Installer must contain the SAS Spawned Servers account.
SAS Spawned Servers account	Member of a group that is the *primary* group for the SAS Installer. (This group does *not* have to be the primary group for the SAS Spawned Servers account.)

Password Policies

Note: In this section, we are talking only about the passwords for the few external user accounts SAS requires, not the passwords for regular users of the system.

When you set up passwords for your SAS system accounts, we *highly recommend* that these passwords do not have to be reset when a user first logs on. If, for some reason, it is required that you create passwords that have to be reset, you will have to log on using each account and change the password before you install and configure your software. And, of course, you will need to know the changed password for each account.

By default, passwords for internal accounts are set not to expire. When passwords for system accounts change, you must use SAS Deployment Manager to update a set of configuration files and some metadata objects. SAS provides instructions for updating these files and metadata objects. However, you can save yourself some time if the passwords do not expire. For more information see “Update a Managed Password” in Chapter 4 of *SAS Intelligence Platform: Security Administration Guide*.

Pre-installation Checklist for External User Accounts for SAS Visual Analytics

Use the following pre-installation checklist to create the necessary external user accounts to deploy and run SAS Visual Analytics.

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at `http://support.sas.com/installcenter/plans`. This website also contains a corresponding deployment plan and an architectural diagram.

Table 2.4 *Pre-installation Checklist for External User Accounts for SAS Visual Analytics*

Account	Recommended User ID	Actual User ID
SAS Installer	sas	
SAS Spawned Servers account	sassrv	

CAUTION! Do not use root as the installer account.

Note these important items:

- For information about the user rights that each external account requires, see “Rights Required by External User Accounts for SAS” on page 27.

- The SAS Deployment Wizard prompts you for the SAS Installer account and the SAS Spawned Servers account information, and you cannot complete the installation without supplying it.
- Prior to configuration, the SAS Deployment Wizard prompts you for the root (or sudo) password. Certain SAS products and features use functionality that requires SAS to check user ID authentication and file access authorizations. This in turn necessitates that certain files within your SAS installation have setuid permissions and be owned by root.
- If your system uses an authentication method other than `/etc/passwd` or `/etc/shadow`, then you must configure authentication before you begin your SAS software deployment, or SAS Visual Analytics will not function properly. For more information, see the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*, available at `http://support.sas.com/documentation/installcenter/en/ikfdtnunxcg/66380/PDF/default/config.pdf`.

Defining Groups

Define the sas Group

To deploy SAS Visual Analytics, you should create an operating system group called sas and make this the primary group for the SAS Installer user. The SAS Spawned Servers account should also be made a member of the sas group. (Members of this group are given access to certain directories and files created by the SAS Deployment Wizard.)

For information about creating groups and adding user accounts, see your Linux documentation.

Pre-installation Checklist for Groups for SAS Visual Analytics

Use the following pre-installation checklist to make sure that you have created the necessary groups to deploy and run SAS:

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at `http://support.sas.com/installcenter/plans`. This website also contains a corresponding deployment plan and an architectural diagram.

Table 2.5 *Pre-installation Checklist for Groups for SAS Visual Analytics*

Recommended Group Name	Group Members	Purpose	Actual Group Name
sas*	SAS Installer	Primary group for the SAS Installer user. Enables the SAS Deployment Wizard to create the necessary log and configuration directories required by SAS.	
	SAS Spawned Servers account	Through group membership, grants Write permissions to the SAS Spawned Server account for modifying specific SAS log and configuration directories.	
	Data Admin user SAS First User Any other users	Owner of the LASRMonitor process. Enables data admin user to load data (create server signature files in **`/opt/VADP/var`**).	

* Limit membership because this privileged group has operating system access to certain configuration files.

Pre-installation Checklist for Groups for Third-Party Software

Use the following pre-installation checklist to create the necessary groups to deploy and run third-party software.

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at `http://support.sas.com/installcenter/plans`. This website also contains a corresponding deployment plan and an architectural diagram.

Table 2.6 Pre-installation Checklist for Groups for Third-Party Software

Recommended Group Name	Group Members	Operating System and Purpose	Actual Group Name
sas	SAS Installer (sas)	Suggested method for assigning required permissions to write to certain installation directories.	

Configure Machine Access

In order for the SAS LASR Analytic Server Monitor process to be able to show the tables that are in-memory on a server instance, network name resolution might need to be modified on the machine that runs the SAS Visual Analytics middle-tier machine.

For deployments that use Greenplum Data Computing Appliance as a co-located data provider, the middle-tier machine is configured as a client of the database, because the SAS/ACCESS Interface to Greenplum is used for accessing data. For the master and segment server host names like mdw, the middle-tier client machine must have network name resolution. In **/etc/hosts** on the SAS middle-tier machine, make sure that your machine names resolve. For example:

```
255.255.255.255  gridhost01  gridhost01.example.com  mdw
# mdw is not normally public
```

For deployments that use SAS High-Performance Deployment of Hadoop as a co-located data provider, the middle-tier machine typically has network name resolution without additional configuration. However, if the machines in the cluster use multiple network interfaces, then make sure that name resolution works. **/etc/hosts** on the SAS middle-tier machine, make sure that your machine names resolve. For example:

```
255.255.255.255  gridhost01  gridhost01.example.com  hdfs0
# hdfs0 is not normally public
```

Designating Ports and Multicast Addresses

About Ports and Multicast Addresses

While you are creating operating system user accounts and groups, you need to review the set of ports that the SAS servers, third-party servers, and spawners in your system will use by default. If any of these ports is unavailable, select an alternate port, and record the new port on the following ports pre-installation checklist:

- “Multicast Address Considerations” on page 32
- “Pre-installation Checklist for Ports for SAS” on page 35

You also need to plan for designating Internet Protocol (IP) multicast addresses for all the machines in your SAS deployment. Multicasting simplifies the ongoing management and deployment of SAS web applications by providing the flexibility to customize the SAS middle tier and to distribute SAS web components to implement load balancing.

Multicast Address Considerations

The SAS Deployment Wizard prompts you to supply a multicast address for inter-machine communication. The wizard supplies you with a default multicast address that it generates based on the machine's IP address and the admin local scope that is recommended in RFC 3171 (IPv4) or RFC 4291 (IPv6).

A multicast group communications protocol is used to communicate among middle-tier SAS applications in a single SAS deployment (the set of applications connected to the same SAS Metadata Server). The combination of multicast IP address and multicast UDP port should be different for each SAS deployment and also different from those used by other multicast applications at your site.

The multicast group communication includes all information needed to bootstrap SAS middle-tier applications. Because this includes sending the SAS environment credentials (such as the sasadm account name and its password), scoping and

encryption options are provided. The defaults are most appropriate for deployments in a firewall-protected, isolated data center environment.

The IP multicast address must be valid for IP multicasting and should be in the range 224.0.0.0 to 239.255.255.255 for IPv4 or have the prefix ff00::/8 for IPv6. Typically, the chosen address is in the admin-local scoped block, which corresponds to 239/8 for IPv4 and ff14::/8 for IPv6. The sample address provided during configuration by the SAS Deployment Wizard conforms to these standards. The address should be unique to SAS applications for the subnet that they are installed on.

The IP Multicast UDP port should be open and usable on the middle-tier machine. This is a UDP port and does not conflict with any previous TCP port definitions, such as the metadata server. The multicast group communication is intended to be used only within your data center environment. Many sites keep their data center network separated from end users via a firewall that automatically isolates the multicast protocol. Alternatively, the time to live (TTL) parameter can be used to restrict the scope of multicast communication. Your network administrator can suggest a TTL setting to limit the scope of the multicast. The TTL option and the authentication token option both have security implications.

The multicast TTL property (default = 1, range = 0–255) affects the number of network hops a multicast packet will take before being dropped. This TTL value must be greater than or equal to the largest number of hops between any two servers containing SAS products. In addition, some network router documentation recommends that multicast datagrams with initial TTL=0 are restricted to the same host, multicast datagrams with initial TTL=1 are restricted to the same subnet, and multicast datagrams with initial TTL=32 are restricted to the same site. Consult your network router documentation or your network administration staff to determine the correct values for your environment.

Note: You must make sure that all of the machines in your SAS 9.4 deployment are members of the same subnet, or be sure to set the default TTL value to a number higher than 1. The deployment wizard gives you the opportunity to set the TTL value during SAS 9.4 deployment. For information about how to change these options after deployment, see Appendix 2, “Administering Multicast Options,” in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Because the multicast protocol conveys credentials, it is protected via encryption. By default, group communication is protected only with a fixed encryption key that is built into the software. If your middle tier is not running in an environment that is well-isolated from end-user access, then you might want better protection against eavesdroppers and unauthorized group participants. For such situations, choose a multicast authentication token known only to your SAS middle-tier administrative staff. The authentication token is a password-like string needed to connect to the group and create a site-specific encryption key.

The deployment wizard default simplifies configuration using the authentication token that is built into the software. This option is best used in development and other low-security environments. It might also be appropriate in higher-security environments where the multicast group communication is isolated from the end-user community, either via firewall or TTL option, and where all data center administrative and operations staff have sufficient security approval.

If your multicast group communication is not contained within an isolated data center environment, or if the security procedures at your site require protections among administrative and operational staff in various roles, you should specify an authentication token that is known only to the administrators of the SAS environment. The same token string must be supplied on each tier in the configuration.

By default, there is a code-level authentication token shared between all SAS middle-tier applications to prevent access to the multicast group from unauthorized listeners. If you choose to use a customized authentication token, use the deployment wizard to enter an authentication token value that meets your organization's security guidelines. The authentication token can be any password-like string. In a multi-tier configuration, this prompt appears on each tier that has an application participating in the SAS multicast groups. You must provide the same authentication token string to each tier in the same SAS deployment (that is, each tier associated with the same metadata server).

For more information about configuring web application servers to use with SAS 9.4, go to the Third-Party Software Downloads site at **http://support.sas.com/resources/thirdpartysupport/v94/index.html** and search for the product name of your web application server.

Pre-installation Checklist for Ports for SAS

The following checklist indicates what ports are used for SAS by default, and gives you a place to enter the port numbers that you actually use.

Note: The SAS Deployment Wizard prompts you for this information, and you cannot complete the installation without it.

We recommend that you document each SAS port that you reserve in the following standard location on each machine: `/etc/services`. This practice helps avoid port conflicts on the affected machines.

The last digit of the default port number reflects the configuration level that you select in the SAS Deployment Wizard. For example, when you select **Lev1**, the default port for the metadata server is 8561. If you choose another level, such as **Lev2**, the wizard changes the default port to 8562.

Note: These checklists are superseded by more complete and up-to-date checklists that can be found at `http://support.sas.com/installcenter/plans`. This website also contains a corresponding deployment plan and an architectural diagram. Consult the pre-installation checklist provided by your SAS representative for a complete list of ports that you must designate.

Table 2.7 *Pre-installation Checklist for Ports (SAS)*

Server or Spawner	Default Port	Data Direction	Actual Port
E-mail server	25	Outbound	
HTTP server	80	Inbound and outbound	
HTTP server (secure port)	443	Inbound and outbound	
SAS Remote Services application	5091	Inbound	
SAS OLAP Server	5451	Inbound and outbound	

Server or Spawner	Default Port	Data Direction	Actual Port
SAS Deployment Agent	5660	Inbound and outbound	
Event Broker administration	6051	Inbound	
SAS Web Application Server JMX Port	6969	Inbound	
SAS Environment Manager	7080	Inbound and outbound	
SAS Environment Manager (secured)	7443	Inbound and outbound	
SAS/CONNECT server and spawner	7551	Inbound and outbound	
Web Report Studio In-Process Scheduling UDP Port 1	7570	Inbound and outbound	
Web Report Studio In-Process Scheduling UDP Port 2	7571	Inbound and outbound	
Web Report Studio In-Process Scheduling UDP Port 3	7572	Inbound and outbound	
Event Broker HTTP	8111	Inbound	
Operating System Services scheduler	8451	Inbound	
SAS/SHARE server	8551	Inbound	
Multicast (UDP port)	8561	Inbound and outbound	
SAS Metadata Server	8561	Inbound and outbound	
SAS object spawner: operator port	8581	Inbound	
SAS Workspace Server	8591	Inbound	

Server or Spawner	Default Port	Data Direction	Actual Port
SAS Stored Process Server: bridge connection	8601	Inbound	
SAS Stored Process Server: load balancing connection 1 (MultiBridge)	8611	Inbound	
SAS Stored Process Server: load balancing connection 2 (MultiBridge)	8621	Inbound	
SAS Stored Process Server: load balancing connection 3 (MultiBridge)	8631	Inbound	
SAS Pooled Workspace Server	8701	Inbound	
SAS object spawner: pooled workspace server port bank 1	8801	Inbound	
SAS object spawner: pooled workspace server port bank 2	8811	Inbound	
SAS object spawner: pooled workspace server port bank 3	8821	Inbound	
SAS Stored Process Server: load balancing connection 3 (MultiBridge)	8631	Inbound	
SAS Pooled Workspace Server	8701	Inbound	
SAS object spawner: pooled workspace server port bank 1	8801	Inbound	
SAS object spawner: pooled workspace server port bank 2	8811	Inbound	
SAS object spawner: pooled workspace server port bank 3	8821	Inbound	
Web Infrastructure Platform Database Server	9432	Inbound and outbound	

Server or Spawner	Default Port	Data Direction	Actual Port
SAS LASR Analytic Server Monitor RMI port*	9971	Inbound	
SAS High-Performance Analytics environment port	10010	Inbound	
SAS High-Performance Configuration Management Console server	10020	Inbound	
SAS Deployment Tester server	10021	Inbound	
SAS Visual Analytics (AutoLoad)	10031	Inbound	
SAS Information Retrieval Studio	10651	Inbound	
SAS Information Retrieval Studio proxy server	10661	Inbound	
SAS Information Retrieval Studio proxy server admin	10671	Inbound	
SAS Information Retrieval Studio proxy server web admin	10681	Inbound	
SAS Information Retrieval Studio pipeline server	10691	Inbound	
SAS Information Retrieval Studio pipeline server admin	10701	Inbound	
SAS Information Retrieval Studio pipeline server web admin	10711	Inbound	
SAS Information Retrieval Studio index builder	10721	Inbound	
SAS Information Retrieval Studio query server	10731	Inbound	

Server or Spawner	Default Port	Data Direction	Actual Port
SAS Information Retrieval Studio query statistics server	10741	Inbound	
SAS Information Retrieval Studio query statistics server UDP	10741	Inbound	
SAS Information Retrieval Studio crawler admin	10751	Inbound	
SAS Information Retrieval Studio web query server	10761	Inbound	
Hadoop Service on the NameNode	15452	Inbound	
Hadoop Service on the DataNode	15453	Inbound	
Cache Locator Port	41415	Inbound and outbound	
Hadoop DataNode address	50010	Inbound	
Hadoop DataNode IPC address	50020	Inbound	
SAS High-Performance Computing Management Console server	10020	Inbound	
Hadoop JobTracker	50030	Inbound	
Hadoop TaskTracker	50060	Inbound	
Hadoop NameNode web interface	50070	Inbound	
Hadoop DataNode HTTP address	50075	Inbound	
Hadoop secondary NameNode	50090	Inbound	
Hadoop NameNode backup address	50100	Inbound	

Server or Spawner	Default Port	Data Direction	Actual Port
Hadoop NameNode backup HTTP address	50105	Inbound	
Hadoop NameNode HTTPS address	50470	Inbound	
Hadoop DataNode HTTPS address	50475	Inbound	
SAS High-Performance Deployment of Hadoop	54310	Inbound	
SAS High-Performance Deployment of Hadoop (MapReduce Job Tracker)	54311	Inbound	
JMS Server Port	61616	Inbound and outbound	

* Not used when deploying the SAS LASR Analytic Server in non-distributed mode.

3

Deploying the SAS Visual Analytics Server and Middle Tier

Overview of Deploying SAS Visual Analytics

This chapter describes how to use the SAS Deployment Wizard to install and configure all of the SAS Visual Analytic server and middle-tier components called for in your deployment plan.

Installing and configuring SAS Visual Analytics is the sixth and final step in deploying SAS Visual Analytics.

1. Create a SAS Software Depot.
2. Check for Documentation Updates.
3. (Optional) Deploy the SAS High-Performance Analytics infrastructure.
4. Create operating system users and groups and designate ports.
5. Deploy required third-party software.
6. **Deploy the servers and middle tier.**

Deploying the SAS Visual Analytics server tier consists of installing and configuring the following components on the server-tier machine:

- SAS LASR Analytic Server Monitor
- SAS Workspace Servers
- SAS Pooled Workspace Servers
- SAS Stored Process Servers

Deploying the SAS Visual Analytics middle tier consists of installing and configuring the following components on the middle-tier machine:

- SAS Visual Analytics Hub

- SAS Visual Analytics Explorer
- SAS Visual Analytics Designer
- SAS Visual Data Builder
- SAS Visual Analytics Report Viewer
- SAS Visual Analytics Administrator
- LASR Authorization Service
- SAS Visual Analytics Transport Service
- Search Interface to SAS Content
- SAS Remote Services

Preparing to Deploy SAS Visual Analytics

Which SAS LASR Analytic Server Mode?

SAS LASR Analytic Server was originally developed to operate in a distributed computing environment and perform analytic tasks on data that is loaded in memory. This is referred to as running the server in *distributed* mode.

The server can also run on a single machine, or in *non-distributed* mode.

SAS enables you to license SAS LASR Analytic Server to run in distributed mode, non-distributed mode, or both modes. The server mode that you deploy and run is driven by the license that accompanies your order. For more information, see your SAS representative.

Deploy the SAS High-Performance Analytics Environment

SAS Visual Analytics that uses SAS LASR Analytic Server running in *distributed* mode is dependent on the SAS High-Performance Analytics environment. Before you proceed, make sure that you have consulted the *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide*, available at `http://support.sas.com/documentation/solutions/hpainfrastructure/`.

SAS Deployment Wizard Options

The *SAS Deployment Wizard* is a cross-platform utility that installs and configures many SAS products. Using a SAS installation data file (SID file) and a deployment plan (plan.xml) for its initial input, the wizard is designed to prompt the customer for all of the remaining input at the start of the session so that the customer does not have to monitor an entire deployment.

About Deployment Plans

A *deployment plan* describes what software should be installed and configured on each machine in a SAS deployment. A deployment plan is an XML file that is used as input to the SAS Deployment Wizard. Deployment plans for Visual Analytics are created by a SAS representative specifically for a site.

- A SAS representative has created a custom deployment plan for you (an XML file or a ZIP file containing an XML file), and it has been e-mailed to your site.
- Your deployment plan must be a valid SAS 9.4 plan. The SAS Deployment Wizard does not accept plans from earlier SAS releases.

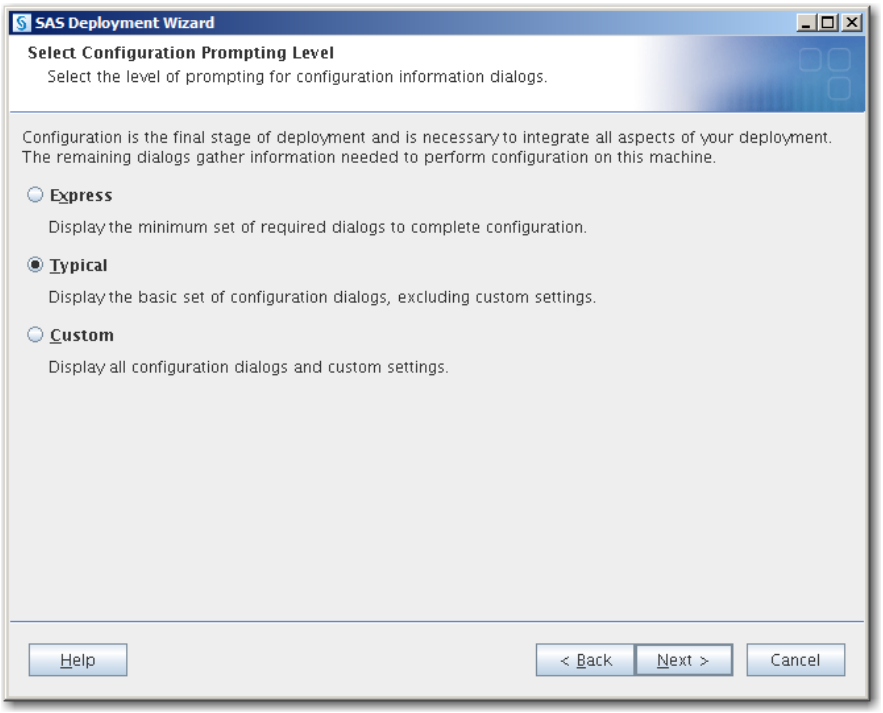
At the end of the SAS deployment, the SAS Deployment Wizard makes a copy of the deployment plan that it used. The deployment plan can be helpful when you want to add another SAS product or change your SAS configuration. The wizard stores a copy of the deployment plan in the SAS configuration directory in the utilities directory, and inserts a date and time stamp to the deployment plan filename. For example:

```
/opt/SAS/config/Lev1/Utilities/plan.2014-01-23-08.36.xml
```

SAS Visual Analytics Configuration Options

To provide values specific to installing and configuring SAS Visual Analytics, choose the deployment wizard's **Typical** or **Custom** prompting options.

Figure 3.1 *Select Configuration Prompting Level Page*



The following table lists SAS Deployment Wizard pages that are specific to SAS Visual Analytics and the prompting level under which you can find them. For a listing of the other configuration prompts associated with the SAS Intelligence Platform, see "Configuration Options by Prompt Level" on page 134.

In addition, there are JVM settings that are recommended for SAS Web Application Server and SAS Remote Services. For more information, see "Web Applications: Automatic Deployment" on page 80 and "SAS Web Infrastructure Platform Database: JDBC Properties" on page 75.

Table 3.1 *Configuration Options by Prompt Level*

Configuration Option in the SAS Deployment Wizard	Distributed Server Only	Prompt Level That Displays the Option		
		Express	Typical	Custom
SAS Internal Account: Search Interface to SAS Content User on page 92*		X	X	X
SAS Visual Analytics Services Database Credentials on page 90*		X	X	X
SAS Visual Data Builder Database Credentials on page 92*		X	X	X
SAS Visual Analytics: Allow Guest Access on page 73*			X	X
SAS Visual Analytics Data Provider on page 86*			X	X
SAS Visual Analytics High-Performance configuration information on page 85*			X	X
SAS Visual Analytics Data Provider: Hadoop on page 87*	X		X	X
SAS Visual Analytics Public Data Library: Hadoop on page 88*	X		X	X
SAS Visual Analytics Data Provider: Greenplum on page 89*	X		X	X
SAS Visual Analytics Public Data Library: Greenplum on page 89*	X		X	X
SAS Visual Analytics Data Provider: Teradata on page 89*	X		X	X
SAS Visual Analytics Public Data Library: Teradata on page 90*	X		X	X

Configuration Option in the SAS Deployment Wizard	Distributed Server Only	Prompt Level That Displays the Option		
		Express	Typical	Custom
SAS Visual Analytics Public Data Provider on page 88*			X	X
SAS LASR Analytic Server Monitor Configuration Information on page 91*			X	X
SAS Visual Analytics Public Data Library Information on page 92*			X	X
SAS Visual Analytics AutoLoad location on page 92*			X	X
SAS Information Retrieval Studio on page 91*			X	X
Search Interface to SAS Content Feeder Configuration on page 92*			X	X
SAS Visual Analytics Administrator: SAS LASR Analytic Server Library on page 94*			X	X
SAS Visual Analytics Administrator: Public LASR Libraries on page 94*			X	X
SAS Visual Analytics Transport Service: Whitelist Mobile Devices on page 91*			X	X
SAS Visual Analytics: Protocol for OpenStreetMap Server on page 94*			X	X
SAS Visual Analytics: Configure ArcGIS Server on page 91*			X	X
SAS Visual Analytics: ArcGIS Server Details on page 91*			X	X

Configuration Option in the SAS Deployment Wizard	Distributed Server Only	Prompt Level That Displays the Option		
		Express	Typical	Custom
SAS Visual Analytics Explorer: Context Root on page 95*				X
SAS Visual Analytics High-Performance Configuration Properties on page 90*				X
SAS Information Retrieval Studio Port Numbers on page 91*				X
SAS Visual Analytics Designer: Context Root on page 93*				X
SAS Visual Analytics Hub: Context Root on page 93*				X
SAS Visual Analytics Report Viewer: Context Root on page 93*				X
SAS Visual Analytics Admin: Context Root on page 93*				X
SAS Visual Analytics Services Hyperlink Service: Context Root on page 93*				X
SAS Visual Data Builder: Context Root on page 94*				X
SAS Visual Analytics Graph Builder: Context Root on page 91*				X
SAS Visual Analytics Data Provider: Hadoop Ports on page 88*				X

* An asterisk (*) next to a configuration option indicates that more information is available in this document. See the SAS Deployment Wizard online Help for information about all options.

SAS Deployment Agents

The SAS Deployment Agent is required for deployments that run remote processes. SAS uses the agent to copy content and to perform configuration management operations associated with creating new servers and clustering. It is also used for server administration tasks such as deployment backups.

Configuring a remote deployment agent includes specifying a communications port, providing security credentials such as truststore and keystore locations and passwords, and indicating whether the process should be started on your behalf.

You have the option to delay configuring the SAS Deployment Agent. However, the SAS Deployment Wizard does install the agent in your SAS installation directory (SAS Home). You can configure the agent at a later time by using the Manage SAS Deployment Agent Service task in the SAS Deployment Manager. (The deployment agent prompt occurs in this portion of the SAS deployment, “Step 20” in Chapter 6 of *SAS Intelligence Platform: Installation and Configuration Guide*.)

By default, the SAS Deployment Agent does not have the keystores, truststores, or client authentication required for remote connection security enabled. If you require remote connection security and do not have a keystore and truststore and their passwords, you must create them using the Java keytool command. When you have a keystore and truststore, specify their network locations and passwords in order to secure remote communications. For more information, see Chapter 5, “Setting Up Certificates for SAS Deployment,” in *SAS Intelligence Platform: Installation and Configuration Guide*.

Metadata Server Clustering

A metadata server cluster is a group of three or more host machines (nodes) that have been configured as identical metadata servers. Each node runs its own server process and has its own server configuration information, journal file, and copy of the repository data sets. In addition, each node maintains a complete in-memory copy of the metadata repository. The nodes work together as if they were a single metadata server.

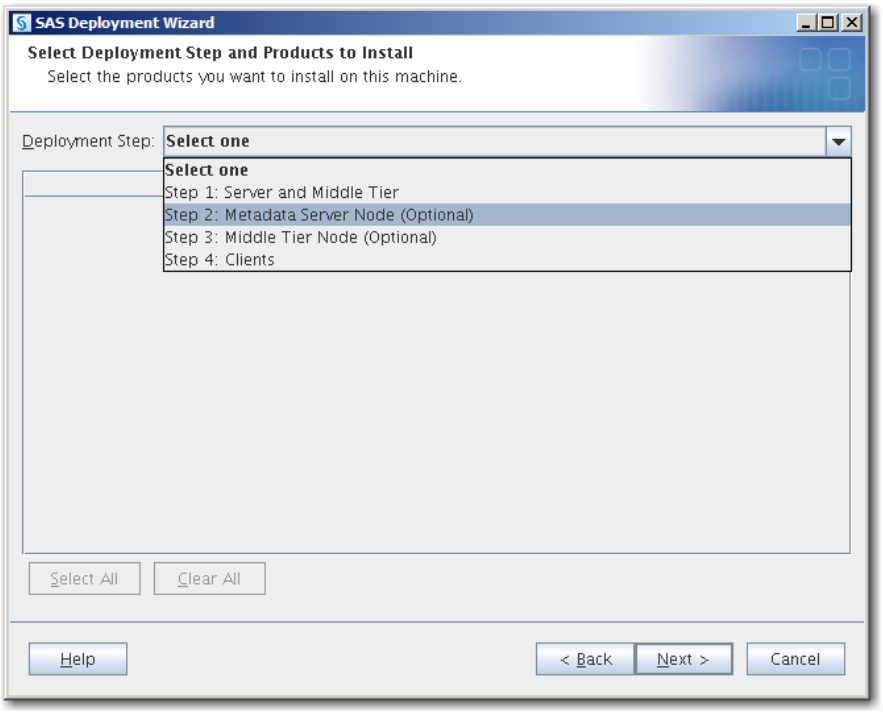
Clustering provides redundancy and high availability of the metadata server.

Client applications and users interact with the cluster in the same way that they would interact with a metadata server that is not clustered. A load balancing process automatically distributes work among the nodes. If a node ceases to operate, the server continues to be available using the remaining nodes.

Clustering is currently supported only on Windows and UNIX machines. All of the nodes in the cluster must have the same operating system.

You deploy your metadata cluster by installing an initial metadata server, and then moving to another machine and running the deployment wizard to deploy a metadata server node. You indicate which type of metadata server you want to deploy by choosing the appropriate step on the deployment wizard Select Deployment Step and Products to Install page.

Display 3.1 *Select Deployment Step and Products to Install Page*



For more information, see Chapter 17, “Using Metadata Server Clustering,” in *SAS Intelligence Platform: System Administration Guide*.

Server Tier and Middle Tier Topology Constraint

If the SAS Visual Analytics server tier and middle tier are deployed on separate machines, these machines must use operating systems in the same operating system family (for example, Red Hat Enterprise Linux 6.1, x86, 64-bit and SUSE Linux Enterprise System 11 SP1, x86, 64-bit are both in the same family). The SAS Metadata Server and the SAS Web Infrastructure Platform may be located on machines that use a different operating system family.

Web Application Servers

SAS supports multiple web application servers on the middle-tier machine.

SAS Web Application Server Clustering

Server clustering provides availability and enhances performance. In SAS 9.4, enhancements have been made to the deployment model to better support clustering of SAS Web Application Servers. You can easily configure vertical cluster members (additional server instances on the same machine) and horizontal cluster members (install and configure servers on additional machines). Combining vertical and horizontal clustering is also supported and can be configured easily.

For more information, see *SAS Intelligence Platform: Middle-Tier Administration Guide*, available at **http://support.sas.com/documentation/cdl/en/bimtag/66823/PDF/default/bimtag.pdf**.

Installation Order Rules for Multiple Machine Deployments

Be aware that if you are deploying SAS on a multiple-machine, distributed system, you must install software on your computers in a particular order:

1 *Always* install SAS software on the metadata server machine first.

2 If you are implementing metadata server clusters, install the metadata server nodes next.

3 Install the SAS application servers (such as workspace or stored process servers) on machines other than the metadata server machine.

4 If your deployment plan separates SAS Web Server from SAS Web Application Server, install SAS Web Server first.

5 Install the middle tier.

6 For SAS deployments where the metadata server and middle tier reside on the same machine, remember that the SAS server tier (the compute tier) must be configured *after* the metadata server and *before* the middle tier.

7 If you are implementing SAS Web Application server clusters, install the application server nodes next.

8 Install software on machines that will host only clients last.

SAS Metadata Server Recommendation

We recommend that you deploy the SAS Metadata Server on a dedicated server machine. A machine running only the metadata server greatly simplifies tuning, management, and diagnostics.

For more recommendations, see the SAS Metadata Server section in the System Requirements document for your SAS product.

Metadata Content Repository Considerations

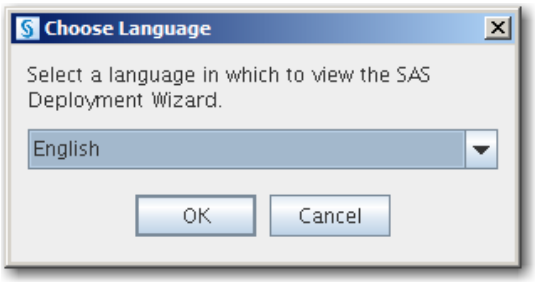
We recommend that your metadata repositories reside either on a local file system or a high-performance, high-availability network file system. For more information about metadata repositories, see “About SAS Metadata Repositories” in Chapter 18 of *SAS Intelligence Platform: System Administration Guide*.

Locale and Encoding Considerations

The SAS Deployment Wizard enables you to select the default locale and languages for the SAS Deployment Wizard and for SAS 9.4. (A separate tool, the SAS Deployment Manager, enables you to configure the locale of SAS Java clients. For more information, see Appendix 4, “Change Locale for SAS,” in *SAS Intelligence Platform: Installation and Configuration Guide*.)

One of the first dialog boxes in the deployment wizard is the Choose Language dialog box.

Display 3.2 *Choose Language Dialog Box*

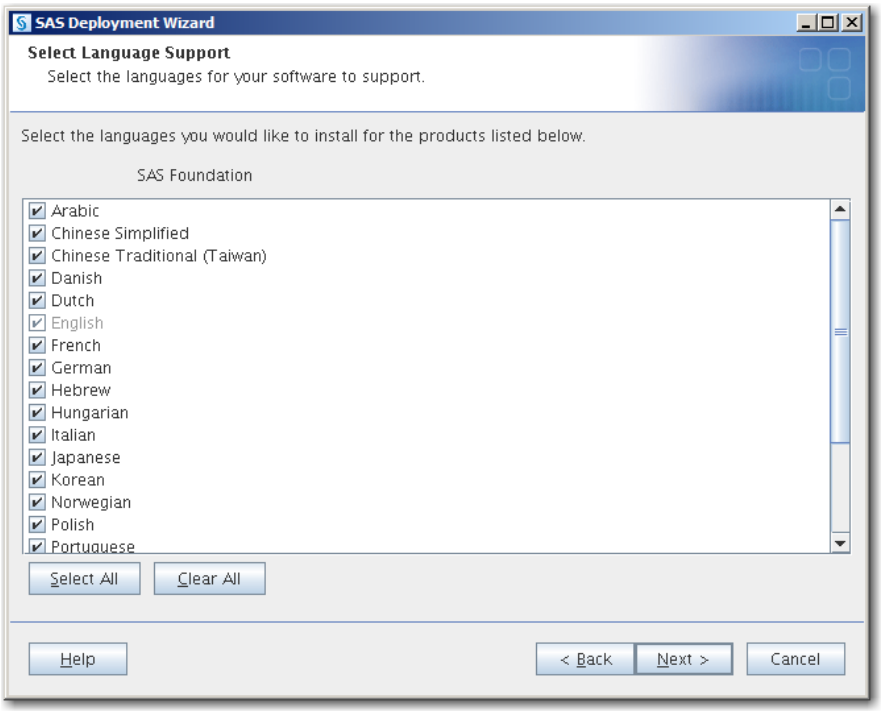


The language that you select in the Choose Language dialog box causes two actions:

- indicates the language that the deployment wizard uses to display text
- specifies the language that the SAS Metadata Server uses to store objects in its repository

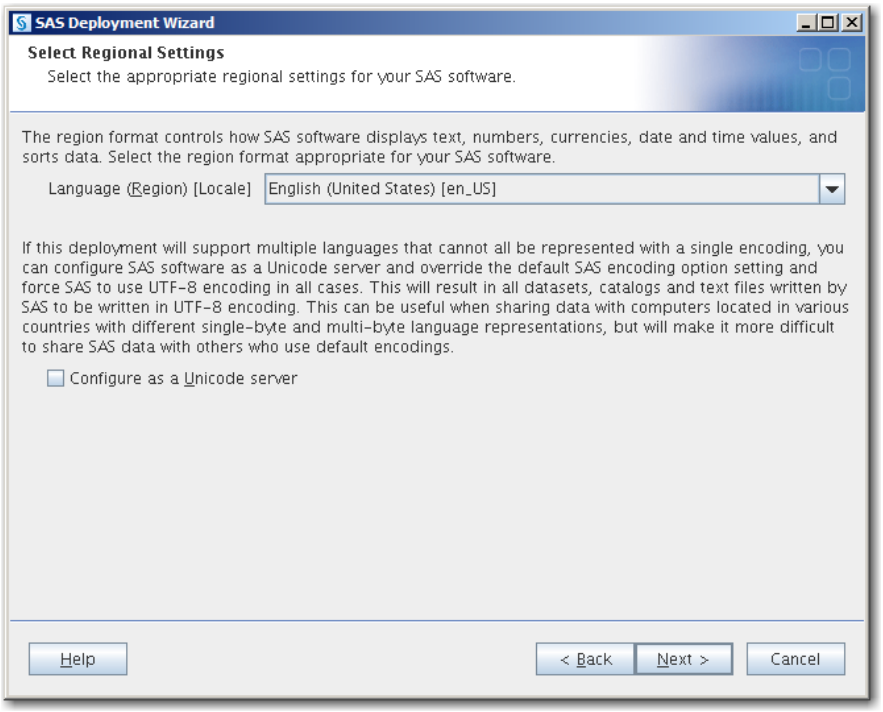
Further into the deployment wizard, you have an opportunity to set the language that your SAS 9.4 products support.

Display 3.3 *Select Language Support Page*



And finally, the deployment wizard prompts you for your locale settings.

Display 3.4 *Select Regional Settings Page*



The locale (or regional) setting controls how SAS 9.4 displays the following:

- text
- numbers
- currencies
- dates
- times
- data (sorting)

On Windows and UNIX machines, you can choose to configure SAS 9.4 as a Unicode server. Unicode can be particularly useful when your SAS deployment supports multiple languages. Choosing to make SAS a Unicode server means that SAS reads and writes all of its data sets, catalogs, and text files in UTF-8 encoding. UTF-8 encoding supports both single- and double-byte character sets. However, UTF-8 can make data sharing with SAS sites that use default encodings problematic.

CAUTION! The SAS automated deployment tools do not support changing locale after SAS is initially deployed. For example, you cannot initially deploy SAS as English (US), and then reconfigure SAS with the SAS Deployment Manager and change the locale to French.

For single-byte character set languages, the chosen locale is set in the configuration file that matches the default language and also in the English configuration file. For example, if you choose fr_FR, this value is added to both the French and English configuration files.

For double-byte character set languages, the chosen locale is set in the configuration file that matches the default language and English (US) is set as the default locale for English (SBCS), with some exceptions.

When a locale is set, a default encoding is used for that locale and the operating system.

For more information about how SAS supports locales and encodings, see the *SAS National Language Support (NLS): Reference Guide*.

A Note about Host Names

The SAS Deployment Wizard follows the Internet Host Table Specification and does not allow underscore characters (_) in host names. For more information about what constitutes a valid host name, refer to RFC 952 at `http://www.rfc-base.org/txt/rfc-952.txt`.

How the Deployment Wizard Names SAS Web Application Servers

The SAS Deployment Wizard creates multiple SAS Web Application servers as needed, based on the products in your SAS order. By default, each SAS web application is assigned to a specific server for deployment. This distribution helps balance the load on each server, and defines a recommended number of servers based on the products in each configuration.

Most of the time, the deployment wizard numbers these servers sequentially (for example, SASserver1, SASserver2, and SASserver3). However, depending on your

particular SAS product order, the default application server names might not be named sequentially.

If you use the default names (for example, `SASserver`*n*) in your configuration, then we recommend that you also maintain the default numbering scheme.

Reviewing Third-Party Database Requirements

The SAS 9.4 middle-tier software and certain SAS solutions software use the SAS Web Infrastructure Platform Data Server to store transactions. The data server relies on PostgreSQL 9.1.9 and is configured specifically to support SAS 9.4 software.

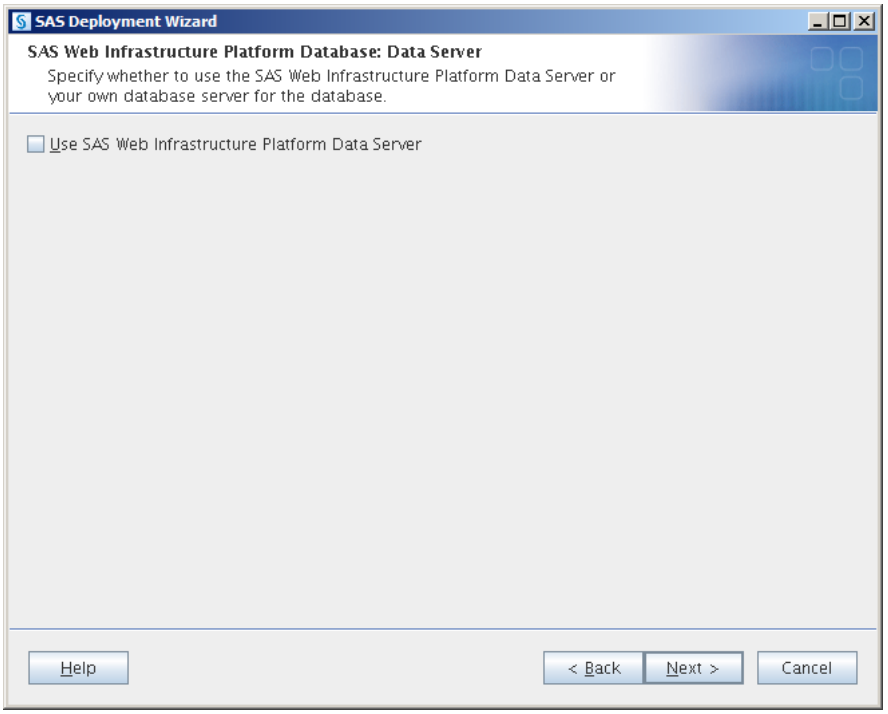
SAS enables you to use a database management system other than the SAS Web Infrastructure Platform Data Server for storing transactional data for the SAS middle tier and certain SAS solution software. (The SAS Deployment Wizard gives you this option when you choose the Custom prompting level.) In SAS 9.4, the following third-party databases are supported:

- DB2
- MySQL
- Oracle
- PostgreSQL
- SQLServer
- Teradata

Third-party databases often have particular requirements that you need to know about, such as database name limits, minimum tablespace sizes, and so on. If you have not already, make sure that you review “Configuring an Alternative Database for SAS Web Infrastructure Platform Services,” available at `http://support.sas.com/resources/thirdpartysupport/v94/appservers/SharedServicesAlternativeDatabase.pdf`.

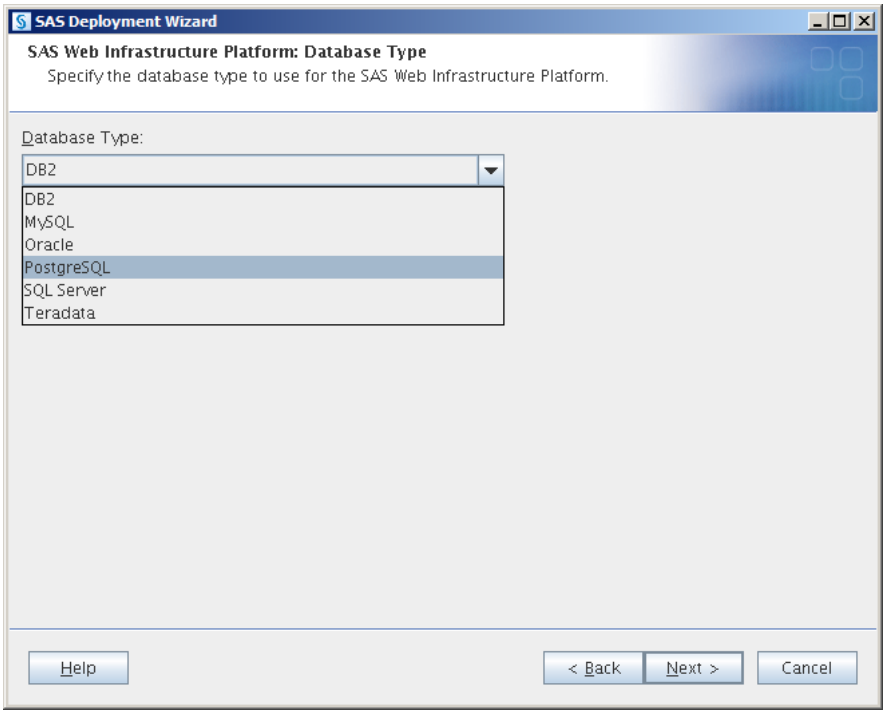
If you want to use a third-party database, you must deselect **Use SAS Web Infrastructure Platform Data Server** on the SAS Web Infrastructure Platform Database: Data Server page during SAS installation and configuration.

Figure 3.2 SAS Web Infrastructure Platform Database: Data Server



On the SAS Web Infrastructure Platform: Database Type page, you choose the database management system type for the database that you plan to use.

Figure 3.3 *SAS Web Infrastructure Platform: Database Type*



Later, the SAS Deployment Wizard prompts you for additional information about your database, including a database user ID and password. The user ID that you specify must have the ability insert, update, and delete database records. For more information, see “SAS Web Infrastructure Platform Database: JDBC Properties” in Chapter 6 of *SAS Intelligence Platform: Installation and Configuration Guide*.

Deploy SAS Visual Analytics Interactively

Installing and configuring SAS Visual Analytics interactively with the SAS Deployment Wizard consists of two main phases:

- Providing installation information such as the following:
  - installation type (planned or unplanned)

  - deployment plan location (if planned)
  - machine type (single machine, server machine, and so on)
  - SAS components to be installed on the machine
  - valid paths to any required pre-installed, third-party software
- Providing configuration information such as the following:
  - prompting level (express, typical, custom)
  - SAS components to be configured on the machine
  - configuration directory name
  - single sign-on preference (Windows only)
  - required user account credentials
  - server port numbers

This topic describes the installation and some of the more important configuration pages that you encounter during the configuration phase of a SAS Visual Analytics deployment. The type and number of configuration-related pages that you see depend on the prompt level and the contents of your SAS Visual Analytics custom order. “Configuration Options by Prompt Level” on page 134 lists which configuration options are available for each prompt level. For information about all SAS Deployment Wizard prompts, see the online Help for the wizard page in question.

To install and configure SAS Visual Analytics interactively, complete these steps:

1 Make sure that you have reviewed all of the documents listed in “Step 2: Check for Documentation Updates” on page 17.

2 Verify that you have performed the earlier required steps outlined in “Preparing to Deploy SAS Visual Analytics” on page 43.

Note: A few pages into the SAS installation, the SAS Deployment Wizard prompts you for paths to the requested third-party software. The necessary third-party software must be installed on the current machine, or the SAS Deployment Wizard will *not* let you continue with the installation. In this situation, you need to end the

SAS Deployment Wizard session and install the required third-party software before you can continue.

3 If you are deploying SAS LASR Analytic Server in non-distributed mode, you see fewer configuration prompts. You do not see any prompts regarding data providers and SAS High-Performance Management Console. For a list of the prompts that you see, refer to Table 3.1 on page 46.

4 If you use any garbage collection scripts, temporarily suspend these scripts during SAS Deployment Wizard execution. If any wizard temporary files are deleted during wizard execution, configuration failures can occur.

5 Review information about where to source certain SAS content repositories described in "Metadata Content Repository Considerations" on page 52.

6 Review information about SAS Deployment Wizard configuration prompting levels described in "Configuration Options by Prompt Level" on page 133.

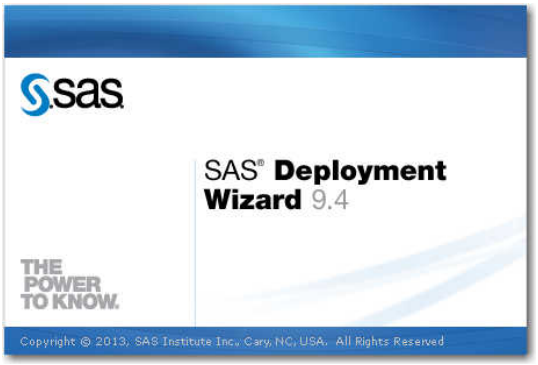
7 Log on to the machine on which you plan to install the SAS Visual Analytics server and middle tier (blade0). Do not use `root`.

8 Start the SAS Deployment Wizard from the highest-level directory in your SAS Software Depot using this command: **`setup.sh -record -deploy`**

Note: Using the `-record -deploy` options causes the wizard to create a response file that records the inputs that you supplied. This can be helpful when you want to repeat the deployment on other machines or when troubleshooting a deployment issue.

By default, the deployment wizard writes the response file in the following location: **`~/sdwresponse.properties`**

You should see a welcome page similar to the following:



9 Select the language that you want the SAS Deployment Wizard to use when it displays text.

For more information, see “Locale and Encoding Considerations” on page 53.

10 Select **Install SAS Software**.

11 Specify the location (SAS Home) where you want to install SAS. Although your SAS Home and SAS configuration directories can share the same parent directory, one directory *cannot* reside inside another. Also, SAS Home should *not* be a directory within your SAS Software Depot.

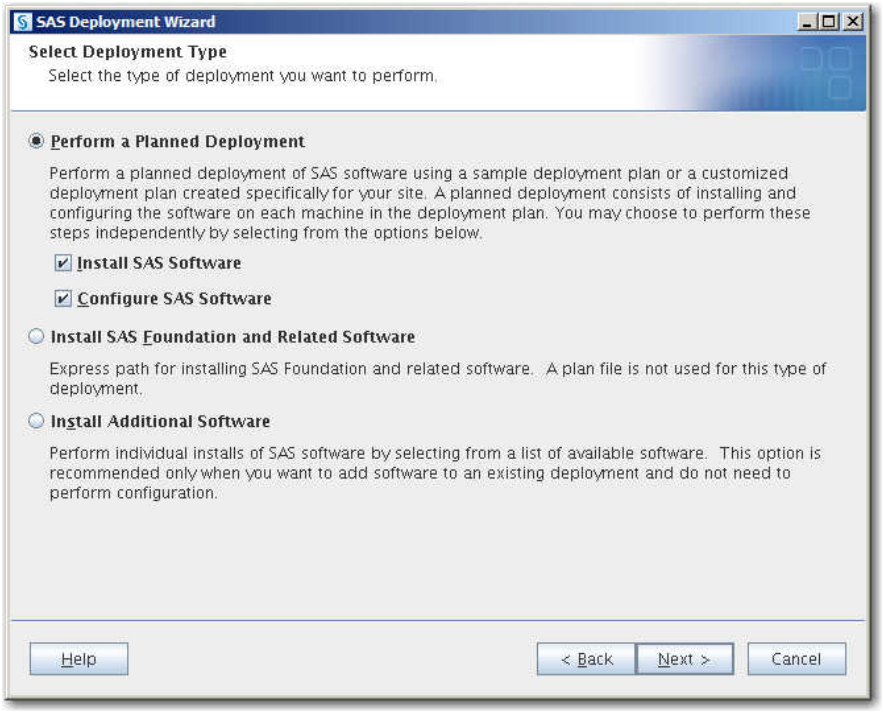
Note: Sharing the same SAS install directory (SAS Home) that is used by previous SAS versions is not supported in SAS 9.4.

Note: On z/OS, the length of the SAS Home path cannot exceed 54 characters.

Note: On Windows, the deployment wizard prompts you for SAS Home the first time you run the wizard. On any subsequent sessions on this machine, the wizard uses the previously specified location for SAS Home.

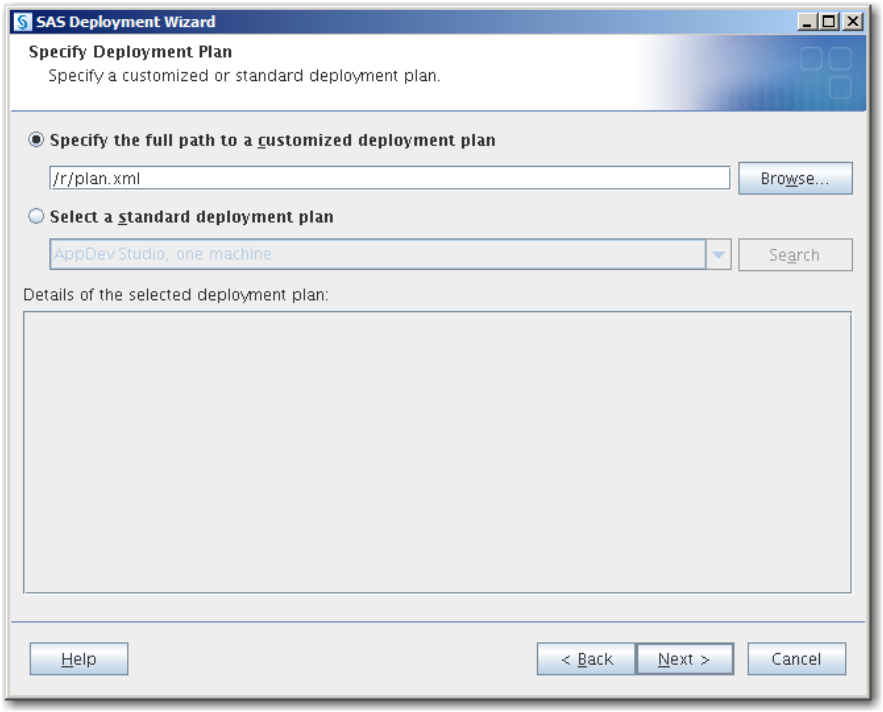
12 If you have more than one SAS software order in your depot, the wizard prompts you to select the order that you want to deploy.

13 Select **Perform a Planned Deployment**, and make sure that **Install SAS Software** and **Configure SAS Software** are both selected.



14 Choose **Specify the full path to a customized deployment plan**, and then enter the path to the deployment plan provided to you by your SAS representative.

For more information, see “About Deployment Plans” on page 44.

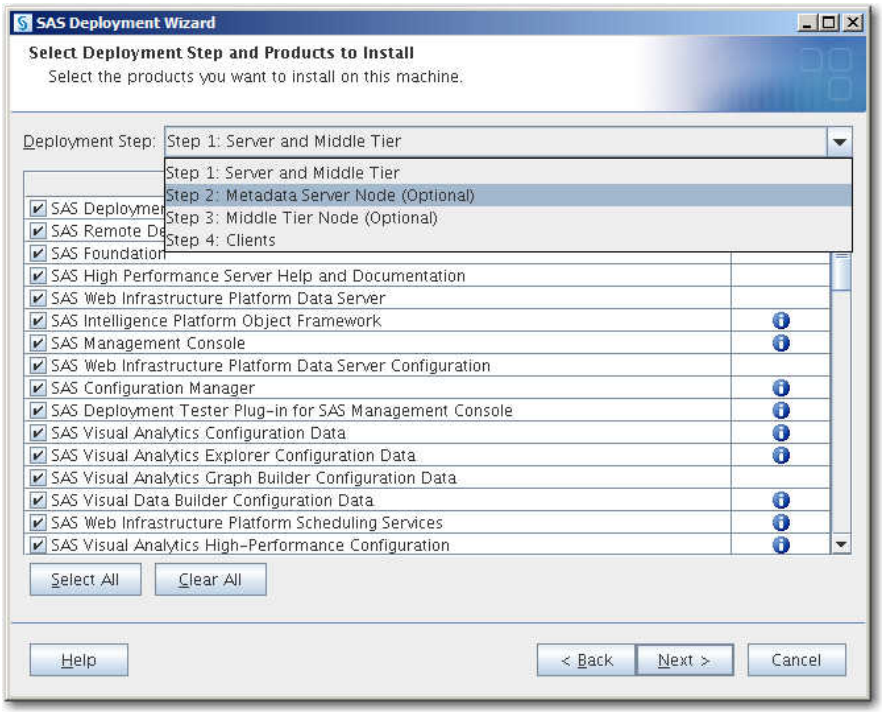


15 Select the machine on which you are installing software, and select the SAS products that you want to install, by doing the following:

a Select the machine on which you are installing software from the **Deployment Step** drop-down list.

Note: If the SAS Visual Analytics server tier and middle tier are deployed on separate machines, these machines must use operating systems in the same operating system family (for example, Red Hat Enterprise Linux 6.1, x86, 64-bit and SUSE Linux Enterprise System 11 SP1, x86, 64-bit are both in the same family). The SAS Metadata Server and the SAS Web Infrastructure Platform may be located on machines that use a different operating system family.

b By default, all products displayed will be installed. Deselect any products that you do *not* want to install.



16 Specify the location of the SAS installation data file that contains information about the software that you have licensed for the current machine.

CAUTION! Be careful to use the correct installation data file that contains the SAS products that you are planning to install. Using an incorrect file can cause installation failure for SAS add-on products or other errors later when attempting to run SAS.

17 Deselect any languages that you do not want SAS to support. By default, SAS attempts to support all languages that your machine's operating system is configured for.

18 Select the locale, which affects how SAS displays text, numbers, currencies, dates, times, and sorts data. If you want to configure SAS as a Unicode server, do that here.

For more information, see "Locale and Encoding Considerations" on page 53.

19 When prompted for SAS Deployment Agent configuration, accept the default port (5560), unless you want to change the port. For more information, see "SAS

Deployment Agents" in Chapter 6 of *SAS Intelligence Platform: Installation and Configuration Guide*.

Then make one of the following selections in **Specify how to secure the remote connection**. For more information, see Chapter 5, "Setting Up Certificates for SAS Deployment," in *SAS Intelligence Platform: Installation and Configuration Guide*:

- Choose **Generate credentials to secure the connection** if you want the deployment wizard to create a self-signed certificate, generate a keystore, and import the certificate into the keystore.
- Choose **Specify existing credentials to secure the connection** if you already have implemented CA-, site-, or self-signed certificates. On the next page, the wizard prompts you for the keystore location and password.
- Choose **Do not secure the connection** if you do not want to secure SAS Deployment Agent communication, or have not yet implemented certificates.

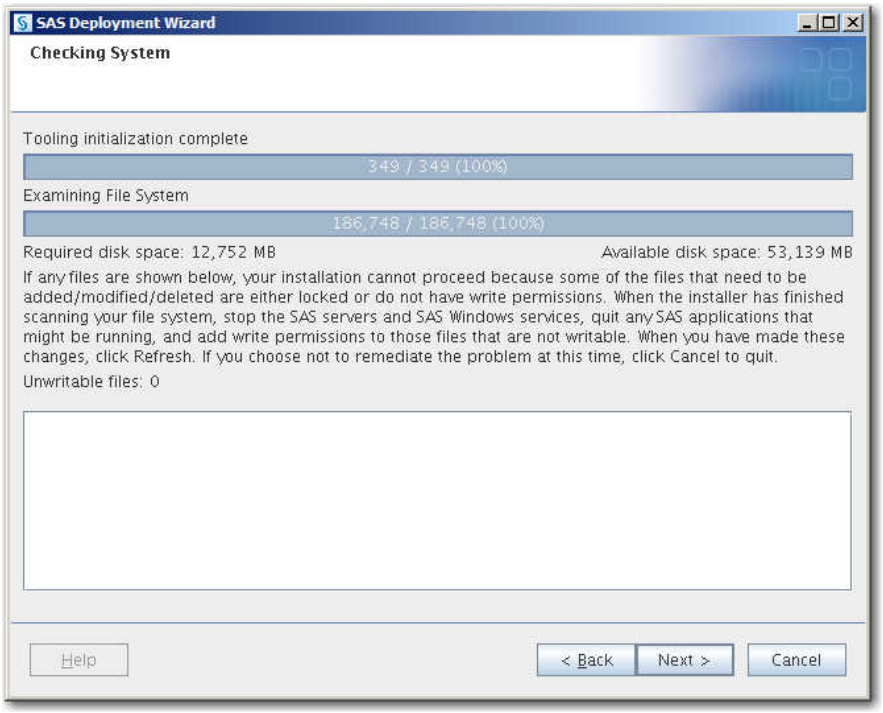
  You can set up certificates later on your own or by using the SAS Deployment Manager. Do not start the SAS Deployment Agent until you have completed the manual security configuration.

  For more information, see the *SAS Deployment Wizard and SAS Deployment Manager User's Guide*, available at `http://support.sas.com/documentation/installcenter/en/ikdeploywizug/66034/PDF/default/user.pdf`.

20 If you chose to specify certificate credentials, then on the Specify SAS Deployment Agent Keystore Credentials page, enter the following:

- In **Agent Keystore Location**, enter your agent keystore file location (path and filename).
- In **Agent Keystore Password**, enter the password that you used when you created the keystore using the Java keytool command.
- In **Confirm Agent Keystore Password**, reenter the password.

21 The deployment wizard scans your machine to determine whether any pre-existing SAS files are locked or do not have Write permission. If the wizard lists any files in the text box, then while the wizard is running, quit SAS and add Write permission to the files listed. When you are finished, click **Next**.



22 If you use a third-party database and SAS/ACCESS is a part of your order, select the software version for the third-party database.

The deployment wizard uses your selection to configure SAS/ACCESS for the correct version of the third-party database.

Make sure that you perform any additional configuration on your system, such as installing the third-party database client and configuring the system environment for access to the native client libraries. For more information about the correct environment variables, go to the SAS Install Center at `http://support.sas.com/documentation/installcenter/94`, and use the operating system and SAS version to locate the appropriate SAS Foundation Configuration Guide.

23 If your system uses Pluggable Authentication Modules (PAM), select **Use PAM Authentication**. In addition, you might also need to update your PAM configuration files in order for SAS Visual Analytics to use PAM authentication. For more information, see the *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*.

If you are uncertain that this system uses PAM for authentication, contact your system administrator.

Note: Do not select the PAM option if you know that your system uses **/etc/password** or **/etc/shadow** authentication.

24 Review the list of third-party software that is required for the SAS software that you are installing on the current machine. (The list of third-party software depends on the SAS software that you are installing on the current machine.) In the pages that immediately follow, be prepared to provide paths to these third-party applications. For more information about the third-party software versions that SAS 9.4 supports, see the following:

- *Third-Party Software for SAS 9.4* website at **http://support.sas.com/resources/thirdpartysupport/v94/index.html**
- *System Requirements—SAS Visual Analytics (Distributed Mode)*, available at **http://support.sas.com/documentation/installcenter/en/ikvisanlytofrsr/67467/HTML/default/index.html**

(The number of wizard pages varies depending on the SAS software that you are deploying on the current machine.)

Note: You must provide valid paths to the requested third-party software, or the SAS Deployment Wizard will *not* let you continue with the installation.

25 Specify the amount of information to provide to the SAS Deployment Wizard for configuring the SAS software that you are installing on the current machine. Choose one of the three prompting levels:

Note: When deploying the SAS Visual Analytics middle tier, the SAS Deployment Wizard automatically configures your web application server by default. To disable this feature, run the wizard using either the Typical or Custom prompting levels.

Express
display the minimum number of wizard pages needed to complete the SAS configuration.

Typical
display the basic set of wizard pages needed to complete the SAS configuration.

Custom
display all the wizard pages needed to complete the SAS configuration.

Refer to "Configuration Options by Prompt Level" on page 133 for more information about the SAS Deployment Wizard prompting levels.

26 Provide the remaining configuration information as the wizard prompts you for it.

Note: This topic describes some of the more important pages that you encounter during the configuration phase of a SAS Visual Analytics deployment. The options for which the SAS Deployment Wizard prompts you depend on which SAS products are identified in your deployment plan and, in multiple machine deployments, which machine you are currently deploying. "Configuration Options by Prompt Level" on page 134 lists which configuration options are available for each prompt level. For information about all SAS Deployment Wizard prompts, see the online Help for the wizard dialog box in question.

Specify Configuration Information
Select the path where the SAS Deployment Wizard will write SAS configuration files and logs and the level that you want to deploy (for example, Lev1 = production).

Although your SAS configuration and SAS Home directories can share the same parent directory, one directory *cannot* reside inside another. Also, the SAS configuration directory should *not* be a directory within your SAS Software Depot.

In UNIX environments, the SAS Installer generally overrides the default configuration directory with the site's preferred location (for example, `/opt/sas/config`). The installer must have Write permission on this path.

Note: The last digit of the default port number reflects the configuration level that you select in the SAS Deployment Wizard. For example, when you select **Lev1**, the default port for the metadata server is 8561. If you choose another level, such as **Lev2**, the wizard changes the default port to 8562.

For more information, see "Overview of the Configuration Directory Structure" in Chapter 2 of *SAS Intelligence Platform: System Administration Guide*.

On z/OS, the mount point must exist. The SAS Deployment Wizard creates the necessary subdirectories.

Local Machine Name

Enter the complete name of the local host in **Fully-qualified Local Host Name**. The fully qualified local host name typically takes the form of the local host name plus the domain name server (for example, myserver.example.com). Enter a short host name in **Short Local Host Name**. The short local host name is the abbreviated, more common method of referring to the host, usually only a single word.

Migration Information

If you are doing the following:

- not migrating SAS Visual Analytics, ignore this page and click **Next**.
- migrating SAS Visual Analytics, select **Perform migration**, enter an absolute path to your migration package, and click **Next**.

  Refer to the instructions in, "Overview of Migrating SAS Visual Analytics" on page 118.

Deployment Accounts: Type of Accounts

Select whether to use internal accounts when appropriate. Internal user accounts are accounts known only to SAS and are created and authenticated internally in metadata rather than externally.

Note: On Windows, whenever the deployment wizard prompts you for an external account, always enter a domain-qualified user account (for example, myDomain\myAccount).

For more information, see "Internal User Accounts" on page 23.

External Account: Installer

Enter the user ID and password for the external account to be used to install and configure SAS. Depending on the operating system, this account should meet the following requirements:

- Windows:

  Use a domain-qualified account that is available in the long term (for future SAS maintenance) and is a member of the Administrators group.

- UNIX:

Use the same account on all machines on which you are deploying SAS. Do not use `root`.

- z/OS:

  Use the same account on all machines on which you are deploying SAS.

For more information, see "Defining User Accounts" on page 22.

SAS Internal Account: Unrestricted Administrator

Enter a password for the internal account (sasadm@saspw) that the wizard will create to serve as an unrestricted administrator for the purpose of configuring the SAS metadata server.

For more information, see "Defining User Accounts" on page 22.

SAS Internal Account: Trusted User

Enter a password for an internal account (sastrust@saspw) that the wizard will create to enable SAS server and spawner components to communicate securely with each other.

For more information, see "Defining User Accounts" on page 22.

External Account: SAS Spawned Servers Account

Enter the user ID and password for the external account to be used to start the pooled workspace server and the stored process server. On Windows, enter a domain-qualified user ID.

For more information, see "Defining User Accounts" on page 22.

E-mail Server

Enter the port and host name for an SMTP e-mail server that the SAS Metadata Server uses to send e-mail alerts to an administrator if journaling issues arise. The SAS Deployment Wizard also uses this e-mail server as the default for the SAS Application Server to provide e-mail services to various SAS clients. For example, with SAS Data Integration Studio, you can use a Publish to Email transformation to alert users about various data changes. In order for the SAS BI Dashboard to send alerts by e-mail to dashboard users and administrators, the port and host name must be configured for the e-mail server.

For more information, see “Adding or Modifying E-Mail Settings for SAS Application Servers” in Chapter 11 of *SAS Intelligence Platform: Application Server Administration Guide* and “Managing Alert E-mail Options for the SAS Metadata Server” in Chapter 15 of *SAS Intelligence Platform: System Administration Guide*.

SAS Web Infrastructure Platform Database Server

The SAS 9.4 middle-tier software and certain SAS solutions software use the SAS Web Infrastructure Platform Data Server to store transactions. The data server relies on PostgreSQL 9.1.9, and is configured specifically to support SAS 9.4 software.

In **Host Name** enter the fully qualified name of the machine on which the SAS Web Infrastructure Platform Data Server runs.

If you want to change the default TCP/IP port number on which the SAS Web Infrastructure Platform Data Server listens, enter a different value In **Port**.

In **Database User Name** enter the name of the user that will be created by the SAS Web Infrastructure Platform Data Server.

In **Database User Password** enter the password of the user that will be created by the SAS Web Infrastructure Platform Data Server.

Anonymous Web Access

When using SAS authentication, you can select this option to set up a SAS identity for anonymous access to certain web services and web applications that support this feature. Currently, SAS BI Web Services for Java and .NET and the SAS Stored Process Web Application are the only components that support this feature.

For more information, see “Using the SAS Anonymous Web User with SAS Authentication” in Chapter 18 of *SAS Intelligence Platform: Middle-Tier Administration Guide*.

SAS Internal Account: Anonymous Web User

(Optional) Enter the user ID and password for the internal SAS account to be used to grant clients access to applicable SAS Web Infrastructure Platform applications such as SAS BI Web Services and the Stored Process Web

Application. When SAS authentication is being used and the user has not preemptively specified credentials, the client is given access to these web applications under the anonymous user account.

For more information, see “Using the SAS Anonymous Web User with SAS Authentication” in Chapter 18 of *SAS Intelligence Platform: Middle-Tier Administration Guide*.

SAS Visual Analytics Allow Guest Access

Guest access is an optional feature that provides anonymous access to a subset of SAS Visual Analytics resources and functionality. All users who connect to a guest access URL are authenticated as the same service account (the SAS Anonymous Web User), which functions as the single surrogate identity for all connecting users. Guest access is not compatible with web authentication.

Choose **Guest Access Permitted** to allow guest access for participating SAS Visual Analytics applications.

TIP If you are unsure about whether to enable guest access in Visual Analytics, you can create the SAS Anonymous Web User and then easily add guest access *after* installation.

For more information, see “Supporting Guest Access” in Chapter 7 of *SAS Visual Analytics: Administration Guide*.

SAS Web Server: Configuration

The standard port for HTTP traffic is 80. If you want to change this for SAS Web Server, then specify a new port number in **HTTP Port**.

Note: On UNIX systems, you must start servers as root if you want servers to listen on ports lower than 1024. We recommend that you install and configure as a less-privileged user and then start SAS Web Server manually as root.

The standard port for Transport Layer Security (TLS) traffic is 443. If you want to change this for SAS Web Server, then specify a new port number in **HTTPS Port**. (See earlier note.)

In **Configured Protocol** select the communication protocol for SAS WebServer. There are two choices, HTTP (unsecured) and HTTPS (secured).

If you select **HTTPS**, an X509 certificate and private key are required. The deployment wizard prompts you for the paths to these items on a later page. that you will have an opportunity to enter a location for these components or provide information to create them. For more information, see Chapter 5, “Setting Up Certificates for SAS Deployment,” in *SAS Intelligence Platform: Installation and Configuration Guide*.

In **Administrator Mail Address** specify an e-mail address for e-mail sent to the SAS Web Server administrator.

SAS Web Server: Location of X509 Certificate and RSA Private Key

If you already have a private key and a signed certificate, enter the location where these reside.

In **X509 Certificate**, enter the path to the valid X509 certificate with the DNS name of this machine as the Common Name (CN).

In **RSA private key**, enter the path to the RSA private key that is not protected by a passphrase.

For more information, see Chapter 5, “Setting Up Certificates for SAS Deployment,” in *SAS Intelligence Platform: Installation and Configuration Guide*.

Web Application Server: Server Configuration

In **Server Name**, enter a logical name for your managed server. This name is displayed in your application server administrative console and used in administrative scripting.

CAUTION! The managed server name must be unique. Non-unique names will cause your web configuration to fail.

In **Additional JVM Options** enter any additional Java options that you want the managed server JVM (Java Virtual Machine) to use. These JVM options are tagged onto the end of the managed server’s command line. Options that are deployment wizard defaults can be overridden in this way.

Note: If the machine that you are deploying SAS on matches these characteristics:

- uses IPv6 (Internet Protocol version6)

- runs Windows
- communicates with the SAS Foundation Server tier

then you must add the following JVM start-up options either here or later to your web application server start-up script:

- `-Djava.net.preferIPv4Stack=false`
- `-Djava.net.preferIPv6Addresses=true`

For more information, see “Designating Ports and Multicast Addresses” in Chapter 2 of *SAS Intelligence Platform: Installation and Configuration Guide*.

In **HTTP Port**, enter the unsecured port on which the managed server will listen.

In **JMX Port**, enter the port on which the server will listen.

In **Cluster Member Multiplier** specify the number of cluster members that you would like to include on this host. If you select multiple servers to be configured, each will represent a cluster.

SAS Web Infrastructure Platform Database: JDBC Properties

If you selected a database server other than the SAS Web Infrastructure Data Server, then in the following fields are editable:

- In **Database Name** specify the name of the database that contain the SAS Web Infrastructure Database tables.
- In **User ID** specify the user ID for accessing the database used with your SAS Web Infrastructure Database tables. This user ID must have the ability to insert, update, and delete records.
- In **Password** specify a valid password for the user ID associated with the database server account.
- In **Confirm Password** reenter the password that you specified in **Password**.

If you are using the SAS Web Infrastructure Database Server, the database name and user ID is ReadOnly. In **Password** choose a valid password that the deployment wizard will use to create the database server account listed in **User ID**.

In **Confirm Password** reenter the password that you specified in **Password**.

SAS Environment Manager: Administration Database Configuration

By default, the SAS Environment Manager uses the Administration database on the SAS Web Infrastructure Data Server.

If you selected a database server other than the SAS Web Infrastructure Data Server, then in the following fields are editable:

- In **User ID** specify the user ID for accessing the database used with your SAS Web Infrastructure Database tables. This user ID must have the ability to insert, update, and delete records.
- In **Password** specify a valid password for the user ID associated with the database server account.
- In **Confirm Password** reenter the password that you specified in **Password**.

If you are using the SAS Web Infrastructure Database Server, the user ID is ReadOnly. In **Password** choose a valid password that the deployment wizard will use to create the database server account listed in **User ID**.

In **Confirm Password** reenter the password that you specified in **Password**.

SAS Internal Account: SAS Environment Manager Service Account

Enter and confirm a password for the SAS Environment Manager service account (sasevs@saspw). The password must contain at least six characters. Make sure that you supply the same password that was specified in any previous SAS Environment Manager configuration prompts.

This service account is required for the SAS Environment Manager and its agent to communicate while monitoring the processes in your SAS deployment. This internal SAS account has unrestricted administrative access rights to the metadata server. For more information, see “SAS Environment Manager and SAS Metadata Users” in Chapter 9 of *SAS Environment Manager: User's Guide* available at `http://support.sas.com/documentation/cdl/en/evug/66790/PDF/default/evug.pdf`.

SAS Environment Manager: Database Configuration

The SAS Environment Manager uses a default Postgres database supplied by SAS named EVManager to store collected server metrics.

In **User ID** specify a user ID used for accessing the EVManager database.

In **Password** specify a valid password for the user ID associated with the database server account.

In **Database Encryption Passphrase** specify a valid key used for encrypting and decrypting the SAS Environment Manager database user password. The key must be at least eight characters long and can contain letters and numbers only.

In **Confirm Database Encryption Passphrase** reenter the key that you specified in **Database Encryption Passphrase**.

Integrated Windows Authentication

Select to configure workspace servers running on Windows or UNIX to use Integrated Windows authentication (IWA). IWA uses a single sign-on feature, which allows a user's identity, obtained from authentication to the user's desktop, to be securely passed from the desktop to other processes such as the metadata server and the workspace server running on either Windows or UNIX. The mechanism used is typically Kerberos, but on Windows, NTLM can also be used.

You also encounter this page when deploying SAS Enterprise Guide and SAS Add-In for Microsoft Office. If you have not chosen IWA for the workspace server, then choosing IWA for these clients has no effect.

For more information, see "Integrated Windows Authentication" in Chapter 11 of *SAS Intelligence Platform: Security Administration Guide* and the chapter "Configuring Integrated Windows Authentication" in *Configuration Guide for SAS Foundation for UNIX Environments*, available at `http://support.sas.com/documentation/installcenter/en/ikfdtnunxcg/66380/PDF/default/config.pdf`.

If a metadata server is running on Windows, then IWA has turned on by default. For more information, see "SSPI System Option" in *SAS Intelligence Platform: Application Server Administration Guide*.

Server Encryption

Select the encryption level and algorithm that SAS clients and servers use to connect to the SAS Metadata Server.

Choose **Credentials** to encrypt only login credentials. Choose **Everything** to encrypt all communication with the metadata server. (Choosing **Everything** can affect your SAS performance.)

You can specify an encryption algorithm other than SASPROPRIETARY. The other algorithms are: RC2, RC4, DES, TripleDES, and AES.

For more information, see Chapter 13, “Encryption Model,” in *SAS Intelligence Platform: Security Administration Guide* and Chapter 13, “Encryption Model,” in *SAS Intelligence Platform: Security Administration Guide*.

SAS Application Server: Server Context

Enter the name of the server context for the SAS Application Server definition. A server context is a SAS IOM server concept that describes how SAS Application Servers manage client requests. A SAS Application Server has an awareness (or context) of how it is being used and makes decisions based on that awareness. The server context name is prepended to all server names defined in the server context.

Note: The server context name must be unique.

For more information, see “Overview of SAS Application Servers” in Chapter 2 of *SAS Intelligence Platform: Application Server Administration Guide*.

SAS Pooled Workspace Server

Enter the name of the logical pooled workspace server and the pooled workspace in metadata. You also need to enter the name of the machine on which the pooled workspace server runs and the port on which the object spawner listens for client requests to launch pooled workspace servers. The machine name should match the name specified to the object spawner.

For more information, see “Overview of Workspace Servers and Stored Process Servers” in Chapter 3 of *SAS Intelligence Platform: Application Server Administration Guide*.

IP Multicast Version

The deployment wizard detects that this machine has an IPv4 and an IPv6 address. Select the Internet Protocol version appropriate for your system. If you choose IPv6, you are confirming that all servers containing SAS products are connected to an IPv6 enabled network and have IPv6 enabled network interfaces.

For more information, see "Designating Ports and Multicast Addresses" on page 32.

IP Multicast

Accept these IP multicast settings or enter new ones.

A multicast group communications protocol is used to communicate among middle-tier SAS applications in a single SAS deployment (the set of applications connected to the same metadata server). The combination of multicast IP address and multicast UDP port should be different for each SAS deployment and also different from those used by other multicast applications at your site. The defaults are most appropriate for deployments in a firewall-isolated data center environment.

For more information, see "Designating Ports and Multicast Addresses" on page 32.

Web Server: Automated or Manual Configuration Option

Select this option for the deployment wizard to automatically build and configure the SAS web applications as well as configuring a sample web application server for use with SAS 9.4. (To use this wizard feature, make sure that your web application server is not running before proceeding.) For more information, see "Choose Whether to Automatically Configure Your Web Application Server" in Chapter 4 of *SAS Intelligence Platform: Installation and Configuration Guide*.

If you choose not to automatically configure your web application server, you are still prompted for web application server information, and deployment stages such as Configure Products, Deploy Web Applications, and Start Web Application Servers execute to create instructions for manual deployment. When configuration is complete, follow these manual instructions on how to configure your server and deploy your web applications.

For more information, go to **http://support.sas.com/resources/thirdpartysupport/v94/appservers/index.html** and select the product name of your web application server.

Note: Choosing to manually configure your SAS middle tier is an advanced procedure and requires using other documents such as your Instructions.html.

Web Applications: Automatic Deployment

Select to automatically deploy SAS 9.4 web applications to the web application server. For more information, see "Choose Whether to Automatically Deploy the SAS Web Applications" in Chapter 4 of *SAS Intelligence Platform: Installation and Configuration Guide*.

Regardless of whether you choose to automatically deploy your SAS web applications, when building web applications, the wizard also automatically explodes web application archive files (EAR files).

If you choose not to automatically deploy SAS web applications, the deployment wizard writes manual deployment instructions to Instructions.html during the web application deployment stage that you will need to complete after the wizard finishes executing. For more information, go to **http://support.sas.com/resources/thirdpartysupport/v94/appservers/index.html** and select the product name of your web application server.

SAS Content Server: Repository Directory

Enter the location on the disk for the actual contents of the content repository. For more information, see Chapter 10, "Administering the SAS Content Server," in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Deselect **Start initial node as clustered** when you are **not** deploying the SAS middle tier on a machine cluster. (This setting enables journaling and the necessary cluster synchronization processes.)

If you redeploy the middle tier on a machine cluster in the future, you can manually set the Java system property `'-Dcom.sas.server.isclustered=true'` and restart the initial application server node. For more information, see "Adding a Horizontal Cluster Member" in Chapter 15 of *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Authentication Domain

Accept the default value (DefaultAuth), unless you are planning to use a different SAS authentication domain for servers on this machine.

For example, if the metadata server is on Windows and the workspace server is on UNIX, the workspace server might be assigned to a SAS authentication domain named UnixAuth. For more information, see “Manage Authentication Domains” in Chapter 2 of *SAS Management Console: Guide to Users and Permissions*.

Windows Options (run as managed scripts or services)

On Windows, choose how to run your SAS servers, either by using management scripts or running them as Windows services. If you choose the script option, then the user account that runs the object spawner must meet the following requirements on the object spawner machine:

- be the administrator or a member of the Windows Administrator’s group
- have the following Windows local user rights:
  - `Adjust memory quotas for a process`
  - `Replace a process level token`

SAS Metadata Server

If you have any changes for the metadata server, enter them in this page.

The deployment wizard creates a separate server context (SASMeta) for the metadata server and the other servers required to perform metadata server utility functions, such as backup and promotion. A server context is a SAS IOM server concept that describes how SAS Application Servers manage client requests. A SAS Application Server has an awareness (or context) of how it is being used and makes decisions based on that awareness. The server context name is prepended to all server names defined in the server context. Therefore, we recommend that you not change the logical server or server prefix (SASMeta).

For more information, see “Overview of the SAS Metadata Server and Its Initial Configuration” in Chapter 2 of *SAS Intelligence Platform: System Administration Guide*.

Create Common Directories

Select to create common directories for server and spawner logs, user-specific files, data (SAS libraries for tables and cubes), and temporary work tables and files.

When you select this option, the deployment wizard creates the specified directory (`Logs`, `Users`, `Data`, and `Temp`) under the SAS configuration directory.

Enable FIPS-certified Encryption Algorithms

Choose the check box to use the Advanced Encryption Standard (AES) algorithm to encrypt communications to and from a SAS Metadata Server. A block cipher that encrypts 128-bit blocks by using a 256-bit key, AES complies with Federal Information Processing Systems (FIPS) standards. For more information, see "FIPS 140-2 Standards Compliance" in Chapter 1 of *Encryption in SAS*.

Client-side Credentials Policy

Select this option to set the policy to allow users to save their user IDs and passwords in client-side connection profiles on the metadata server for desktop applications. This input sets the value for OMA_SASSEC_LOCAL_PW_SAVE in omaconfig.xml.

For more information, see "Reference Information for omaconfig.xml" in Chapter 30 of *SAS Intelligence Platform: System Administration Guide*.

Query Cache Library

Enter the physical location on the file system where the SAS library will exist for temporary files used when creating optimized tables for query lookup.

In **Query Cache Libref**, enter the SAS library reference that SAS will use to refer to the query optimizer SAS library. The name must be eight characters or shorter and should be unique from other librefs used within this repository. Librefs must start with a letter or underscore and contain only letters, numerals, or underscores. The typical installation libref name is wrstemp. The libref will be used in conjunction with the server context name to form the SAS library name for the optimizer library.

Select **Enable Query Cache** to allow the query optimizer to run. If this selection is not made, then the query optimizer does not attempt to optimize queries and does not create temporary data sets for improving performance during rendering.

In a typical installation this selection is turned on. The temporary files created within the query cache library are visible to anyone with Read permission on the Renderer Optimizer directory, so if you have security concerns with the authorization on this folder, you might want to leave the optimizer off.

For more information, see “Using the Query Cache ” in Chapter 4 of *SAS Intelligence Platform: Web Application Administration Guide*.

SAS Environment Manager Agent (secure communication)

Choose the check box to enable secure communication using Transport Layer Security (TLS) between the SAS Environment Manager and its agents. For more information, see Chapter 5, “Setting Up Certificates for SAS Deployment,” in *SAS Intelligence Platform: Installation and Configuration Guide*.

Choose SAS Environment Manager: Keystore

By default, the SAS Environment Manager uses the CA-certs file shipped with the SAS private JRE.

If you want to use a different keystore, choose **Use a customer-supplied JKS format keystore**.

For more information, see Chapter 5, “Setting Up Certificates for SAS Deployment,” in *SAS Intelligence Platform: Installation and Configuration Guide*.

SAS BI Web Services: Authentication Method

Select the method by which users of SAS BI Web Services are authenticated:

- **SAS Authentication** is managed by the metadata server.
- **Web Authentication** is managed by the web application server using container-based authentication or a third-party product. Selecting **Web Authentication** has these effects:
  - Web authentication for Java BI Web Services is partially configured. For more information, see “Securing SAS BI Web Services for Java ” in Chapter 11 of *SAS Intelligence Platform: Middle-Tier Administration Guide*.
  - BI web applications (such as SAS Web Report Studio, SAS Web Information Portal, and so on) are not affected. You have to configure web authentication for these BI web applications.

- You are not able set up an anonymous web user (as this is incompatible with web authentication).

SAS Remote Services Application: JVM

Note: SAS 9.4 no longer requires SAS Remote Services. However, some custom SAS applications still require SAS Remote Services. The SAS Deployment Wizard deploys SAS Remote Services, but it is not automatically started by default.

Enter the desired initial heap size for the remote services application using the JVM option format.

In **Max JVM Heap Size**, enter the desired maximum heap size for the remote services application using the JVM option format.

In **Additional JVM Options**, enter any additional Java options that you want the Remote Services VM to use. For example, you might want to add `-Dmulticast_udp_ip_ttl=1` to restrict multicast traffic to a single subnet based on your network topology.

For more information, see the *SAS Web Applications: Tuning for Performance and Scalability* available at **http://support.sas.com/documentation/cdl/en/appsrvtuning/66878/HTML/default/viewer.htm#titlepage.htm**.

Web Application Server: Configure Internet Proxy Server

If you are using SAS Information Delivery Portal RSS feeds, then you will have to provide proxy server information. Enter the fully qualified host name for the proxy server and its port that your site uses to access the Internet.

For **NonProxy Hosts**, enter the DNS names of all the machines that should not be accessed through the proxy server. Separate each machine name with a vertical line character (|). Use an asterisk (*) as a wildcard for an entire subnet. For example, *.subnet.com excludes all machines with a DNS name that ends with .subnet.com.

If your site does not allow Internet access on production systems, refer to configuration information available at this SAS website: **http://support.sas.com/resources/thirdpartysupport/v94** and select your web application server.

Web Application Server: Multiple Managed Servers

Select to have the deployment wizard automatically configure multiple managed servers for you using SAS best practices for choosing the server to deploy each application to.

In some situations, it might be preferable to split the SAS web applications across multiple managed servers. This is usually done for performance reasons.

If you chose to manually configure your application servers, you will be provided with recommended configuration settings in a generated instructions file (Instructions.html) when the SAS Deployment Wizard completes.

More advanced performance configuration considerations are documented in the *SAS Intelligence Platform: Middle-Tier Administration Guide*.

SAS Web Infrastructure Platform Database: Data Server

If you want to use a database server other than the SAS Web Infrastructure Platform Data Server to store SAS Web Infrastructure Platform data, then make that choice here. In SAS 9.4, the following third-party database management systems are supported: DB2, MySQL, Oracle, PostgresSQL, SQLServer, and Teradata.

SAS Web Infrastructure Platform: Database Type

Choose the database type to use for the SAS Web Infrastructure Platform Data Server. In SAS 9.4, the following third-party database management systems are supported: DB2, MySQL, Oracle, PostgresSQL, SQLServer, and Teradata.

SAS Visual Analytics relies on the SAS Web Infrastructure Platform Data Server. However, some SAS solutions use other databases for SAS Shared Services.

SAS Visual Analytics High-Performance Configuration Information

In **SAS High-Performance Analytics Environment Host**, specify the machine in the cluster to which the SAS clients connect.

In **Location of the TKGrid Installation on the SAS High-Performance SAS High-Performance Analytics Environment**, specify the path to the `TKGrid` directory on the root node host (for example `/opt/TKGrid`). For more information, see *SAS High-Performance Analytics Infrastructure: Installation and*

Configuration Guide, available at `http://support.sas.com/documentation/solutions/hpainfrastructure/`.

In **SAS High-Performance Analytics Environment Port**, enter the port number in the environment through which SAS clients connect. (By default, the port is 10010.)

In **SAS High-Performance Computing Management Console URL**, enter the URL used to access SAS High-Performance Computing Management Console. (By default, this is: **`http://`*`local_host_name`*`:10020`**

In **Signature files location**, specify the absolute path where the SAS LASR Analytic Server writes signature files.

If you are using SAS LASR Analytic Server in distributed mode, specify a path located on the SAS High-Performance Analytics environment root node. If you are using non-distributed mode, specify a path located on the local machine.

It is important to carefully manage access to the signature files directory. User IDs under which certain activities are performed (for example, starting a server or loading data) must have write access to the directory. Access to a signature files directory can provide access to loaded data, so the signature files directory should be protected against unauthorized access. For more information, see the "Security" chapter in the SAS Visual Analytics: Administration Guide. For more information, see “Signature Files” in Chapter 6 of *SAS Visual Analytics: Administration Guide*.

In **Location for the SAS linguistic distributed binaries**, specify the directory on disk that stores the SAS linguistic binary files. These binaries are required to perform text analysis in SAS LASR Analytic Server with SAS Visual Analytics and to run PROC HPTMINE and HPTMSCORE with SAS Text Miner.

SAS Visual Analytics Data Provider

Specify the co-located data provider to be used with SAS Visual Analytics. The supported values are Hadoop, Greenplum, Teradata, and non-distributed SAS LASR Analytic Server.

Several versions of Hadoop are supported such as SAS High-Performance Deployment of Hadoop, Cloudera Hadoop, Hortonworks Data Platform, and Pivotal HD.

For more information about SAS High-Performance Deployment of Hadoop, see *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide*, available at **http://support.sas.com/documentation/solutions/hpainfrastructure/**.

For more information about Cloudera Hadoop, see *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide*, available at **http://support.sas.com/documentation/solutions/hpainfrastructure/**.

SAS Visual Analytics Data Provider: Hadoop

Specify the machine in the cluster that is the Hadoop NameNode.

In **Hadoop NameNode Port**, enter a port number for the HDFS namenode service, which runs only on the NameNode in the HDFS cluster. This value maps to the Hadoop property `com.sas.lasr.hadoop.service.namenode.port`.

For more information, see *Configuration Guide for SAS 9.4 Foundation for UNIX Environments*, available at **http://support.sas.com/documentation/installcenter/en/ikfdtnunxcg/66380/PDF/default/config.pdf**.

In **Hadoop NameNode Authentication Domain**, enter the domain to use for identifying logins that access the Hadoop NameNode machine.

The authentication domain is a metadata construct that pairs each login with the servers for which that login is valid. The authentication domain provides logical groupings for resources and logins in a metadata repository. This ensures that resources use the same authentication process.

For example, when an application needs to locate credentials that enable a particular user to access a particular server, the application searches the metadata for logins that are associated with the authentication domain in which the target server is registered.

In **Library Name**, enter the library name for the Hadoop library.

In **Libref**, specify the libref for the Hadoop library. Hadoop Path Specify the database for the Hadoop data server.

In **Hadoop Path**, enter the path to database for the Hadoop data server.

SAS Visual Analytics Public Data Library: Hadoop

In **Library Name**, enter the library name for the Public Hadoop library.

In **Hadoop Path**, enter the database for the Public Hadoop data server.

In **Libref** , enter the libref for the Public Hadoop library.

SAS Visual Analytics Public Data Provider

Provide the library definition for a public, non-distributed SAS LASR Analytic Server data provider.

In **Data Reload Library Name**, specify the name for the Reload library.

In **Data Reload Libref**, specify the libref for the Reload library.

In **SAS Visual Analytics Reload Location**, enter the absolute path to the Reload Library.

SAS Visual Analytics Data Provider: Hadoop Ports

In **File System Default Port**, enter the port used to access the NameNode default file system.

In **MapReduce Job Tracker Port**, enter the port used to access the MapReduce server JobTracker process. This value maps to the Hadoop property `mapred.job.tracker`.

In **Primary NameNode HTTP Port**, enter the port on which the NameNode primary web User Interface listens. This value maps to the Hadoop property `dfs.namenode.http-address`.

In **Secondary NameNode HTTP Port**, enter the port on which the NameNode backup web User Interface listens. This value maps to the Hadoop property `dfs.secondary.http.address`.

In **Job Tracker HTTP Port**, enter the port on which the JobTacker Web User Interface listens. This value maps to the Hadoop property `mapred.job.tracker.http.address`.

SAS Visual Analytics Data Provider: Greenplum

In **Greenplum Database Master Host**, enter the host name for the Greenplum Database master host.

In **Greenplum Database Master Port**, enter the port number for the Greenplum Database master host.

In **Greenplum Database Master Authentication Domain**, enter the domain to use for identifying logins that access the Greenplum Database Master Host.

The authentication domain is a metadata construct that pairs each login with the servers for which that login is valid. The authentication domain provides logical groupings for resources and logins in a metadata repository. This ensures that resources use the same authentication process.

For example, when an application needs to locate credentials that enable a particular user to access a particular server, the application searches the metadata for logins that are associated with the authentication domain in which the target server is registered.

In **Library Name**, enter the library name for the Greenplum library.

In **Libref**, enter the libref for the Greenplum library.

In **Greenplum Database**, enter the database schema for the Greenplum data server.

SAS Visual Analytics Public Data Library: Greenplum

In **Library Name**, enter the library name for the Public Greenplum library.

In **Greenplum Database**, enter the database name for the Public Greenplum data server.

In **Libref**, enter the libref for the Public Greenplum library.

SAS Visual Analytics Data Provider: Teradata

In **Teradata Data Server Host**, enter the machine name in the Managed Cabinet that is the Teradata Management Server.

In **Teradata Data Server Authentication Domain**, enter the domain to use for identifying logins that access the Teradata Data Server Host.

The authentication domain is a metadata construct that pairs each login with the servers for which that login is valid. The authentication domain provides logical groupings for resources and logins in a metadata repository. This ensures that resources use the same authentication process.

For example, when an application needs to locate credentials that enable a particular user to access a particular server, the application searches the metadata for logins that are associated with the authentication domain in which the target server is registered.

In **Library Name**, enter the library name for the Teradata library.

In **Libref**, enter the libref for the Teradata library.

In **Teradata Schema**, enter the schema name for the Teradata Data Server.

SAS Visual Analytics Public Data Library: Teradata

In **Library Name**, enter the library name for the Public Teradata library.

In **Teradata Schema**, enter the schema name for the Public Teradata Data Server.

In **Libref**, enter the libref for the Public Teradata library.

SAS Visual Analytics Services Database Credentials

Specify the user ID and password for accessing the database used with SAS Visual Analytics Services.

SAS Visual Analytics Explorer: Context Root

Enter the context root that ties the user to the EAR file that is specified in the **Display Name** field. The URL for using SAS Visual Analytics Explorer is of the form `http://`*machine:port*`/SASVisualAnalyticsExplorer`. Although the machine and port are configured elsewhere and typically apply to the web container as a whole, the **SASVisualAnalyticsExplorer** portion is the *context root*, and you can change it (within the constraints of URL rules).

SAS Visual Analytics High-Performance Configuration Properties

This property is used to create a libref to reference the directory that contains uploaded and extracted SAS data sets. The maximum number of characters for libref names is eight.

SAS Visual Analytics Transport Service: Whitelist Mobile Devices

Device access to SAS Mobile BI is enforced through either a backlist or a whitelist.

Select **Enforce Whitelist for Mobile Devices** to allow only specific devices on the whitelist access to SAS Mobile BI. Otherwise, all devices not on the blacklist have access to SAS Mobile BI.

SAS Information Retrieval Studio Port Numbers

Accept the default port numbers for the various SAS Information Retrieval Studio servers, or enter new ones.

SAS Visual Analytics Graph Builder: Context Root

Enter the context root for SAS Visual Analytics Graph Builder. The URL for using SAS Visual Analytics Graph Builder is of the form **`http://machine:port/SASVisualAnalyticsGraphBuilder`**. Although the machine and port are configured elsewhere and typically apply to the web container as a whole, the **SASVisualAnalyticsGraphBuilder** part is the *context root*, and the user can change it (within the constraints of URL rules).

SAS Visual Analytics: Configure ArcGIS Server

Select **Configure ArcGIS Server** to configure an ArcGIS Server. Otherwise, the deployment wizard skips the ArcGIS Server configuration.

SAS Visual Analytics: ArcGIS Server Details

In **ArcGIS REST Services Directory** provide the URL used to connect to the ArcGIS REST Services Directory in the format: *protocol*://*hostname*:*port*/*instance*/services/*folder*.

SAS LASR Analytic Server Monitor Configuration Information

In **SAS LASR Analytic Server Monitor Host**, enter the SAS LASR Analytic Server Monitor host name.

In **SAS LASR Analytic Server Monitor RMI Registry Port**, enter the Remote Method Invocation (RMI) port that the SAS LASR Analytic Server Monitor listens on for activity.

SAS Information Retrieval Studio

In **Host Name**, enter the SAS Information Retrieval Studio host name.

In **Port**, enter the SAS Information Retrieval Studio port number.

In **Log Directory**, enter the log directory.

(On the **Custom** prompting path only, there are additional ports for the various server components of SAS Information Retrieval Studio, including special ports for administrators and web administrators.)

Search Interface to SAS Content Feeder Configuration

In **Index Loader Interval In Minutes**, enter time interval in minutes to load SAS content to the indexing server.

SAS Internal Account: Search Interface to SAS Content User

This internal user account permits access to SAS content that is supplied to SAS Information Retrieval Studio for indexing.

In **Display Name**, enter the account display name stored in metadata. This is a static field.

In **Name**, enter the account name stored in metadata. This is a static field.

In **Internal User ID**, enter the account user ID stored in metadata. This is a static field.

In **New Internal Password**, enter the metadata password to be created for this account. The password must contain at least six characters.

In **Confirm New Internal Password**, reenter the metadata password to be created for this account.

SAS Visual Data Builder Database Credentials

Specify the user ID and password for accessing the database used with SAS Visual Data Builder.

SAS Visual Analytics Public Data Library Information

Specify the port number in the environment to which the SAS clients connect.

SAS Visual Analytics AutoLoad location

Enter the fully qualified path of the host directory where users place tables for loading to memory.

SAS Visual Analytics Services Hyperlink Service: Context Root

Enter the context root that ties the user to the EAR file that is specified in the **Display Name** field. The URL for using SAS Visual Analytics Services Hyperlink Service is of the form `http://`*machine:port*`/SASVisualAnalyticsDesigner`. Although the machine and port are configured elsewhere and typically apply to the web container as a whole, the **SASVisualAnalyticsDesigner** portion is the *context root*, and you can change it (within the constraints of URL rules).

SAS Visual Analytics Designer: Context Root

Enter the context root that ties the user to the EAR file that is specified in the **Display Name** field. The URL for using SAS Visual Analytics Designer is of the form `http://`*machine:port*`/SASVisualAnalyticsDesigner`. Although the machine and port are configured elsewhere and typically apply to the web container as a whole, the **SASVisualAnalyticsDesigner** portion is the *context root*, and you can change it (within the constraints of URL rules).

SAS Visual Analytics Hub: Context Root

Enter the context root that ties the user to the EAR file that is specified in the **Display Name** field. The URL for using SAS Visual Analytics Hub is of the form `http://`*machine:port*`/SASVisualAnalyticsHub`. Although the machine and port are configured elsewhere and typically apply to the web container as a whole, the **SASVisualAnalyticsHub** portion is the *context root*, and you can change it (within the constraints of URL rules).

SAS Visual Analytics Report Viewer: Context Root

Enter the context root that ties the user to the EAR file that is specified in the **Display Name** field. The URL for using SAS Visual Analytics Report Viewer is of the form `http://`*machine:port*`/SASVisualAnalyticsReportViewer`. Although the machine and port are configured elsewhere and typically apply to the web container as a whole, the **SASVisualAnalyticsReportViewer** portion is the *context root*, and you can change it (within the constraints of URL rules).

SAS Visual Analytics Admin: Context Root

Enter the context root that ties the user to the EAR file that is specified in the **Display Name** field. The URL for using SAS Visual Analytics Administrator is of the form `http://`*machine: port*`/SASVisualAnalyticsAdministrator`.

Although the machine and port are configured elsewhere and typically apply to the web container as a whole, the **SASVisualAnalyticsAdministrator** portion is the *context root*, and you can change it (within the constraints of URL rules).

Visual Analytics Admin: LASR Server

Enter the path in the High-Performance Analytics environment where signature files are created and read.

SAS Visual Analytics Administrator: Public LASR Libraries

Public LASR Library Name specifies the library that is prepopulated for users when they import data files and create data queries. It is offered to provide ease of use rather than data security.

Public LASR Libref, specifies the libref for the public LASR library.

You can modify both of these properties after installation by using SAS Management Console.

SAS Visual Analytics: Protocol for OpenStreetMap Server

The protocol that you specify defines how SAS Visual Analytics Explorer communicates with the OpenStreetMap server hosted by SAS.

Choose **HTTP** (default) to use the standard browser communication.

Choose **HTTPS** to use the Secure Sockets Layer (SSL) protocol for secured communication.

Using HTTPS might result in a decrease in performance, because of additional communication and encryption.

For more information, see *SAS Visual Analytics: Administration Guide* available at `http://support.sas.com/documentation/onlinedoc/va/index.html`.

SAS Visual Data Builder: Context Root

Enter the context root that ties the user to the EAR file that is specified in the **Display Name** field. The URL for using SAS Visual Data Builder is of the form `http://`*machine: port*`/SASVisualDataBuilder`. Although the machine and port are configured elsewhere and typically apply to the web container as a whole, the **SASVisualDataBuilder** portion is the *context root*, and you can change it (within the constraints of URL rules).

SAS Studio Mid-Tier: Context Root

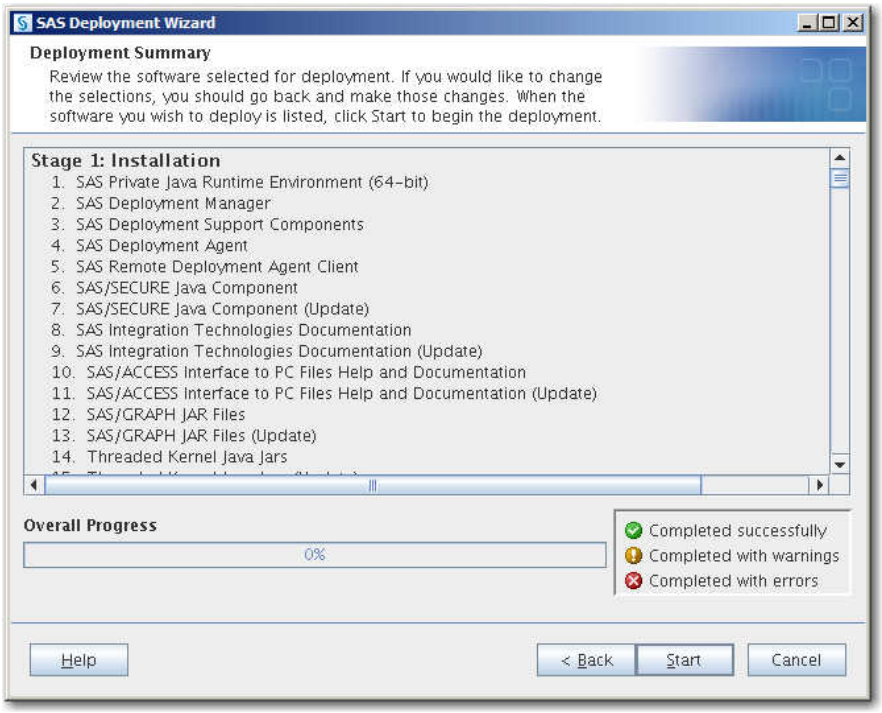
Enter the context root that ties the user to the EAR file that is specified in the Display Name field. The URL for using SAS Studio is of the form http://machine:port/SASStudio. Although the machine and port are configured elsewhere and typically apply to the web container as a whole, the SASVisualDataBuilder portion is the context root, and you can change it (within the constraints of URL rules).

For more information, see *SAS Studio: Administrator's Guide*.

27 When you see the Deployment Summary page, the deployment wizard has finished collecting installation and configuration input. This is the last opportunity to go back and change any information that you have provided in previous pages before the wizard begins writing to your system.

Make one of the following choices:

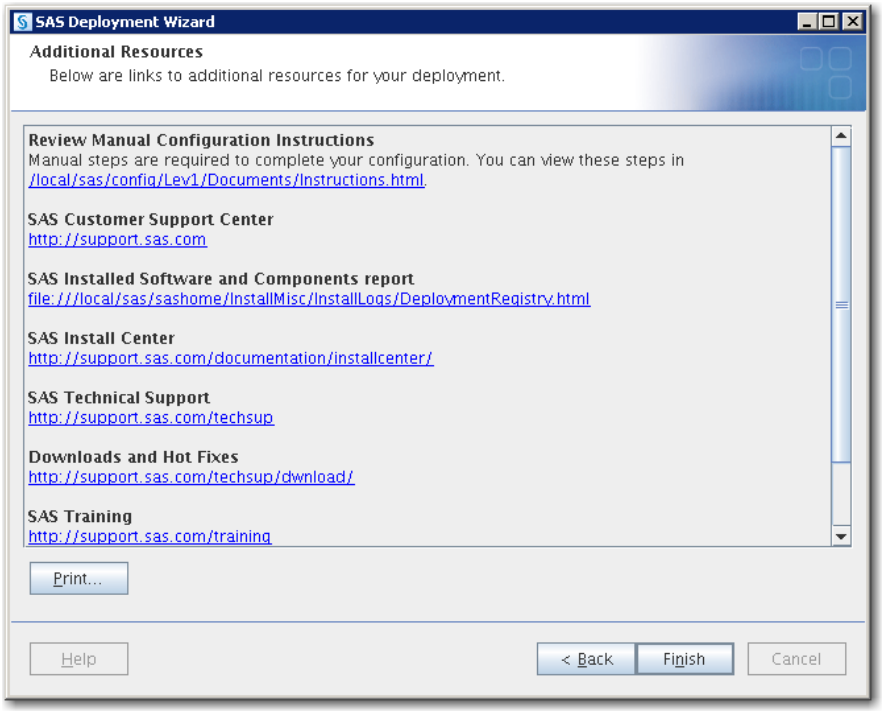
- Click **Start** to begin installing SAS files and writing the configuration to the current machine.
- Click **Back** to navigate to earlier wizard pages to change installation and configuration information previously entered.
- Click **Cancel** to terminate the wizard session. Note that you will lose installation and configuration information previously entered.



When you are installing the server tier, you are instructed to run a script as root. As the message in the installation program explains, certain SAS products and features use functionality that requires SAS to check user ID authentication and file access authorizations. This in turn necessitates that certain files within your SAS installation have setuid permissions and be owned by root.

CAUTION! To avoid configuration failure, do not proceed until the script completes.

When you see a page similar to the following, the SAS Deployment Wizard is finished:



The deployment wizard has installed, configured, and started SAS processes on your machine.

28 Click **Review Manual Configuration Instructions** and complete any necessary manual configuration steps.

The SAS Deployment Wizard writes the Instructions.html file to the `Documents` directory under the SAS configuration path (for example, `/opt/SAS/Lev1/Documents/Instructions.html`).

29 Click **Finish** to close the deployment wizard.

30 Back up your metadata repository and your SAS configuration directory.

- Make a backup copy of your SAS Visual Analytics configuration directories by using your site-approved method. Your SAS configuration directories are all the child directories beneath the path that you specified earlier in this procedure on the **Specify Configuration Information** wizard page.
- Back up your web application server directories.

- Back up your metadata repository and repository manager. For more information, see Chapter 12, “Best Practices for Backing Up and Restoring Your SAS Content,” in *SAS Intelligence Platform: System Administration Guide*.

31 If you opted not to automatically deploy your SAS web applications, then you must manually deploy them. For more information, go to the Third-Party Software Downloads site at `http://support.sas.com/resources/thirdpartysupport/v94/appservers/index.html`.

32 Be sure to restart any servers that you stopped for purposes of creating a backup.

33 Proceed to the section “Validate Your SAS LASR Analytic Server Monitor Deployment” on page 101.

Validate Your SAS Visual Analytics Deployment

Below is a list of suggestions that you can use to validate your SAS Visual Analytics deployment. The SAS Visual Analytics documentation referenced is available at `http://support.sas.com/documentation/onlinedoc/va/index.html`.

Table 3.2 *Validation Suggestions for SAS Visual Analytics*

Actions	Purpose	More Information
In SAS High-Performance Computing Management Console: 1 Use the SAS LASR Analytic Server installer account (sas), or create a new administrator account such as saslasradm. 2 Assign the Windows user right **Log on as a batch job** to the account. 3 Create SSH keys (already done for the installer account).	An account is created for use later in the validation.	To create an account, see "How to Add a User" in the *SAS Visual Analytics: Administration Guide*. To create SSH keys, see "Managing Users and Groups" in Chapter 4 of *SAS High-Performance Computing Management Console: User's Guide*.
In SAS Management Console: 1 Define a Visual Analytics Administrator (use the account created earlier, saslasradm). 2 Assign the administrator user to the Visual Analytics Data Administrators and Visual Data Builder Administrators groups. *	A SAS identity is created for use later in the validation.	*SAS Management Console: Guide to Users and Permissions*
In SAS Management Console, define a library and register a table. (You can use sashelp: **`!SASROOT/sashelp`**.)	Sample data is created for use later in the validation.	*SAS Intelligence Platform: Data Administration Guide*
Log on to the home page as the saslasradm. (**`http://VA-host.example.com/SASVisualAnalyticsHub`**)	Validates that the home page is running and valid logins are accepted.	*SAS Visual Analytics: User's Guide*

Actions	Purpose	More Information
On the home page, click **Manage Environment**. Then do the following: 1 Start a SAS LASR Analytic Server. 2 Add a SAS table directly to SAS LASR Analytic Server.	Demonstrates that SAS Visual Analytics Administrator is functional and able to communicate with the SAS LASR Analytic Server.	*SAS Visual Analytics: Administration Guide*
On the home page, click **Prepare Data**. Then do the following: 1 Create a visual data query. 2 Click **Home** in the banner to return to the home page. *	Demonstrates that SAS Visual Data Builder is functional.	*SAS Visual Analytics: User's Guide*
On the home page, click **Explore Data**. Then do the following: 1 Create a SAS Visual Analytics exploration. 2 Click **Home** in the banner to return to the home page.	Demonstrates that SAS Visual Analytics Explorer is functional.	*SAS Visual Analytics: User's Guide*
On the home page, click **Create Report**. Then do the following: 1 Create a SAS Visual Analytics Report. 2 Click **Home** in the banner to return to the home page	Demonstrates that SAS Visual Analytics Designer is functional.	*SAS Visual Analytics: User's Guide*
On the home page, click on a report. Use the object inspector on the home page to view details about the report, and then click **View**.	Demonstrates that SAS Visual Analytics Designer is functional.	*SAS Visual Analytics: User's Guide*

Actions	Purpose	More Information
Deploy SAS Mobile BI. View a SAS Visual Analytics Report on a mobile device.	Demonstrates that SAS Mobile BI is operable.	*SAS Visual Analytics: User's Guide*

* SAS Visual Data Builder requires that an identity be a member of the Visual Data Builder Administrators group. Members of the Visual Analytics Data Administrators group do not have access to SAS Visual Data Builder.

Validate Your SAS LASR Analytic Server Monitor Deployment

On distributed server deployments only, SAS LASR Analytic Server Monitor is responsible for ensuring that the In-Memory Data, HDFS content explorer, Resource Monitor, and the Process Monitor features available in the SAS Visual Analytics Data Preparation interface are functional and available to users.

To validate the SAS LASR Analytic Server Monitor deployment, follow these steps:

1. Log on to the SAS LASR Analytic Server Monitor machine (blade 0) using the SAS Installer account.
2. Change to the SAS LASR Analytic Server Monitor configuration directory.

   By default this is **`SAS-configuration-directory/Lev`***`n`***`/Applications/SASVisualAnalytics6.4/HighPerformanceConfiguration`**.
3. Run LASRMonitor.sh with a user account that normally starts the server, or with a user account that has Read permissions on the lasrmonitor.pid file (in the same folder as the LASRMonitor.sh script).
4. Enter the following command to confirm that SAS LASR Analytic Server Monitor is running:

   ```
   LASRMonitor.sh status
   ```

5 If the SAS LASR Analytic Server Monitor is not already running, enter the following command:

```
LASRMonitor.sh start
```

For more information, see the *SAS Visual Analytics: Administration Guide* available at **http://support.sas.com/documentation/onlinedoc/va/index.html**.

4

What to Do Next: Administration Tasks

Overview of Required Administration Tasks

After installing and configuring SAS Visual Analytics using the SAS Deployment Wizard, you must perform certain administration tasks. These tasks are organized into the following topics:

- “Review Post-deployment Documentation” on page 104
- “Check Status for SAS Visual Analytics Servers” on page 104
- “Create SAS Users and Groups” on page 105
- “SAS Web Application Required Tasks” on page 106

Review Post-deployment Documentation

Review the Instructions.html file that is generated by the SAS Deployment Wizard. This file provides an overview of the configuration guidelines and details. Any warnings that were generated during the deployment process are described in this file. The file is in the following location:

***SAS-config-dir*/Levn/Documents/Instructions.html**

Review SAS Intelligence Platform Post-deployment Documentation

Review the chapter, “What to Do Next: Administration Tasks” in the *SAS Intelligence Platform: Installation and Configuration Guide*.

Check Status for SAS Visual Analytics Servers

Ensure that the SAS Visual Analytics servers are running:

- The status of SAS High-Performance Computing Management Console on the server tier is checked with the following command:

  ```
  service sashpcmc status
  ```

- The status of the server-tier SAS servers is checked with the following command:

  ```
  SAS-config-dir/Levn/sas.servers status
  ```

  For more information, see *SAS Intelligence Platform: System Administration Guide*.

- The status of SAS LASR Analytic Server Monitor is checked with the following command:

  ```
  SAS-config-dir/Levn/Applications/SASVisualAnalytics6.4/
  HighPerformanceConfiguration/LASRMonitor.sh status
  ```

  For more information, see “Managing the Monitoring Server” in the *SAS Visual Analytics: Administration Guide*.

- The status of SAS Information Retrieval Studio Server is checked with the following command:

  ```
  SAS-config-dir/Levn/Applications/
  SASInformationRetrievalStudioforSAS1.5/IRStudio.sh status
  ```

  For more information, see “Supporting the Search Features” in the *SAS Visual Analytics: Administration Guide*.

Create SAS Users and Groups

The following tasks related to SAS users and groups need to be performed. For more information, see the *SAS Visual Analytics: Administration Guide*, available at `http://support.sas.com/documentation/onlinedoc/va/index.html`.

- Create operating system groups and user accounts for data administrators on the machines in the cluster.
- Create SAS metadata users for the operating system accounts for data administrators, and add these users to the metadata group Visual Analytics Data Administrators Group.

  (Membership in the Visual Analytics Data Administrators Group grants metadata users explicit permission to use a default library for the distributed database.)
- Create groups and users in SAS metadata for SAS Visual Explorer, SAS Visual Designer, and the mobile viewers.

For more information, see “Roles and Capabilities,” in the *SAS Visual Analytics: Administration Guide*, available at **http://support.sas.com/documentation/onlinedoc/va/index.html**.

SAS Web Application Required Tasks

The following web application tasks must be performed:

- Specify the application-specific ulimit settings for SAS Web Application Server. In this document, SAS Web Application Server resides either on blade 0, on the Greenplum MDW, or on the Teradata TMS.
  - Specify the following ulimit settings for the web application server instance. The file is named: under ***SAS-configuration-directory*/Levn/Web/WebAppServer/SASServer1_1/bin/setenv.sh**.

    For a deployment with multiple JVMs, update SASServer12_1; for a single JVM deployment, update SASServer1_1:

    ```
    ulimit -n 20480
    ulimit -u 8192
    ulimit -s 256
    ```

  Note: These ulimit settings are made in the start-up scripts and not at the system level in **/etc/security/limits.conf**.

  Note: These ulimit settings correspond to the suggested JVM options for SAS Web Application Server. For more information, see “Web Applications: Automatic Deployment” on page 80.

  - Specify ulimits for SAS Visual Analytics in **/etc/security/limits.conf**.

    The following is an example for ulimit settings. This can vary for deployments:

    ```
    ulimit -n 150000
    ulimit -u 100000
    ulimit -s 10240
    ```

  - Enable SAS Information Retrieval Studio to support Search Interface to SAS Content.

- By default, SAS Visual Analytics schedules cron to run the **loadindex.sh** command on a specified interval.

For more information about these two tasks, see the *SAS Visual Analytics: Administration Guide*, available at **http://support.sas.com/documentation/onlinedoc/va/index.html**

Appendix 1

Deploying SAS LASR Analytic Server in a Different Mode

Overview of Deploying SAS LASR Analytic Server in a Different Mode

SAS LASR Analytic Server has two modes of operation:

- Distributed mode runs in a distributed computing environment and perform analytic tasks on data that is loaded in memory.
- Non-distributed mode runs on a single machine.

SAS enables you to license SAS LASR Analytic Server to run in distributed mode, non-distributed mode, or both modes. The server mode that you deploy and run is driven by

the contents of your order and the license that accompanies it. For more information, see your SAS representative.

Using the SAS Deployment Wizard and the SAS Deployment Manager, you can do the following:

- deploy the server in non-distributed mode.

  For more information, see "Deploy Visual Analytics with SAS LASR Analytic Server in Non-distributed Mode" on page 110.

- deploy the server in distributed mode.

  For more information, see "Deploy SAS Visual Analytics Interactively" on page 59.

- add a server to run in non-distributed mode.

  For sites that are licensed for both server modes, you can add and run a server in non-distributed mode. For more information, see "Add a SAS LASR Analytic Server to Run in Non-distributed Mode" on page 112.

- convert a non-distributed server to a distributed server.

  Your non-distributed servers are upgraded, and you can run the server in distributed mode only. For more information, see "Convert Non-distributed SAS LASR Analytic Servers to Distributed Mode" on page 113.

Deploy Visual Analytics with SAS LASR Analytic Server in Non-distributed Mode

Deploying Visual Analytics with SAS LASR Analytic Server in non-distributed mode is very similar to the process for deploying in distributed mode. The major difference is that you do *not* have to deploy the SAS High-Performance Analytics environment:

1 Review additional documentation.

  For more information, see "Step 2: Check for Documentation Updates" on page 17.

2 Create a SAS Software Depot.

For more information, see “Creating a SAS Software Depot” in the *SAS Intelligence Platform: Installation and Configuration Guide*, available at `http://support.sas.com/documentation/cdl/en/biig/63852/PDF/default/biig.pdf`.

3 Create operating system users and groups and designate ports.

When deploying SAS LASR Analytic Server in non-distributed mode, there is no SAS LASR Analytic Server Monitor nor do you have to set up a passwordless secure shell (SSH).

For more information, see Chapter 2, “Setting Up Users, Groups, and Ports,” on page 21.

4 Deploy required third-party software.

For more information, see *System Requirements—SAS Visual Analytics (Non-distributed Mode)*, available at `http://support.sas.com/documentation/installcenter/en/ikvisanlytofrndmsr/67468/HTML/default/index.html`.

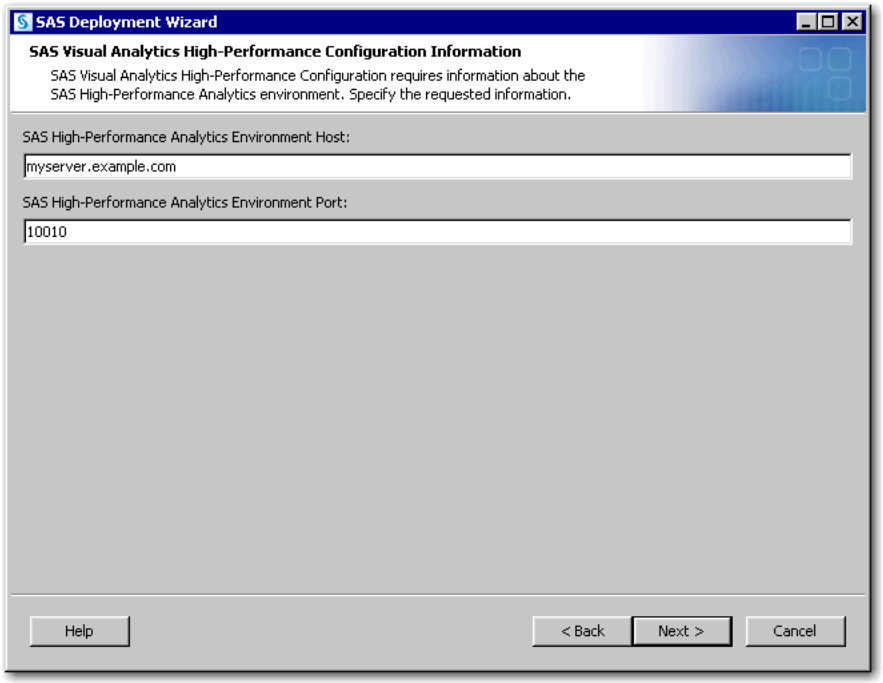
See also the SAS 9.4 third-party support site located at `http://support.sas.com/resources/thirdpartysupport/v94`.

5 Deploy the servers and middle tier.

The SAS Deployment Wizard displays the appropriate configuration prompts based on your SAS LASR Analytic Server license. In Figure A1.1, the SAS Deployment Wizard displays no configuration prompts that pertain to SAS LASR Analytic Server running in distributed mode.

For more information, see Chapter 3, “Deploying the SAS Visual Analytics Server and Middle Tier,” on page 41.

Figure A1.1 SAS Visual Analytics High-Performance Configuration Information Page



Note: You see the SAS Visual Analytics High-Performance Configuration Information page only when you choose either the **Typical** or **Custom** prompting level in the SAS Deployment Wizard. For more information, see "SAS Visual Analytics Configuration Options" on page 45.

Add a SAS LASR Analytic Server to Run in Non-distributed Mode

For sites that are licensed to run both server modes, the SAS Deployment Wizard prompts you during installation to deploy SAS LASR Analytic Server in distributed mode only. (Actually, the non-distributed mode is deployed silently.) When sites are licensed for both server modes, to create a non-distributed SAS LASR Analytic Server, you use SAS Management Console.

For more information, refer to the *SAS Visual Analytics: Administration Guide* available at http://support.sas.com/documentation/onlinedoc/va/index.html.

Convert Non-distributed SAS LASR Analytic Servers to Distributed Mode

When converting to distributed mode, your non-distributed servers are upgraded, and SAS retains their names. (We recommend that you rename these new distributed servers.)

To convert your SAS LASR Analytic Servers to run in distributed mode, follow these steps:

1. Shut down your SAS server and middle tiers.

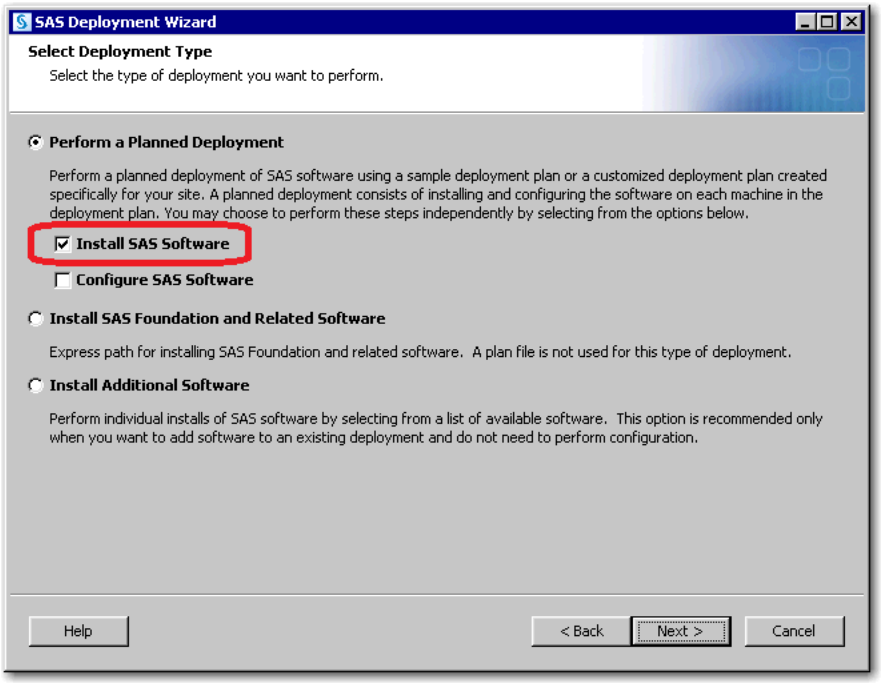
   For more information, see the *SAS Intelligence Platform: System Administration Guide*, available at http://support.sas.com/documentation/cdl/en/bisag/66813/PDF/default/bisag.pdf.

2. Deploy the SAS High-Performance Analytics environment on your data appliance or machine cluster.

   For more information, see the *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide*, available at http://support.sas.com/documentation/solutions/hpainfrastructure/index.html.

3. Run the SAS Deployment Wizard with it set to install only.

Figure A1.2 SAS Deployment Wizard Install Mode



Follow the directions in the topic, “Deploy SAS Visual Analytics Interactively” on page 59.When the Select Deployment Type page appears, make sure that you choose **Install SAS Software**. Make sure that **Configure SAS Software** is deselected. For more information, see “Specify Configuration Information” on page 69.

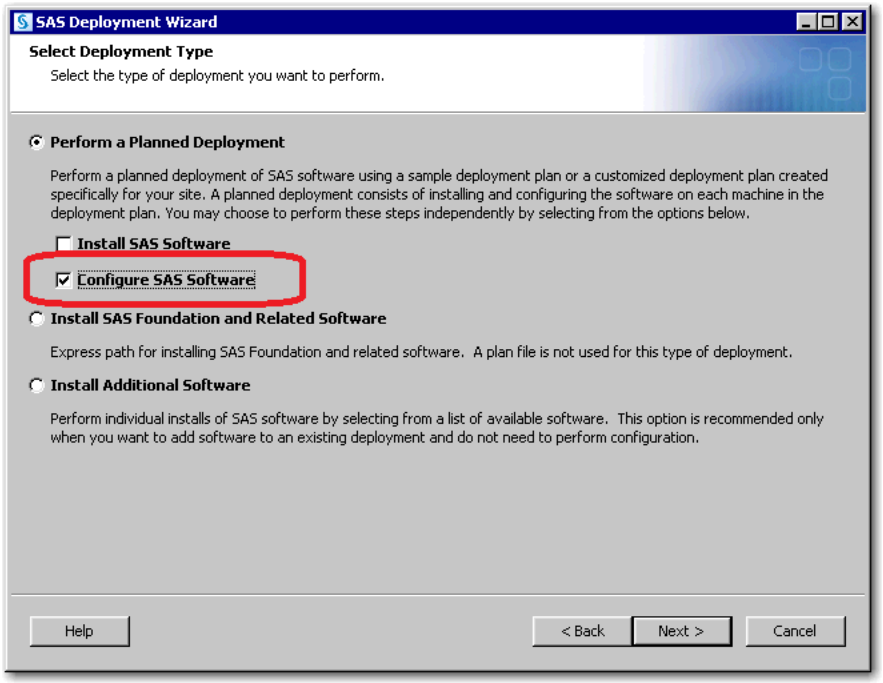
4 When the deployment wizard is finished, restart your SAS server tier.

For more information, see Chapter 6, “Operating Your Servers,” in *SAS Intelligence Platform: System Administration Guide* available at `http://support.sas.com/documentation/cdl/en/bisag/66813/PDF/default/bisag.pdf`.

5 Rerun the SAS Deployment Wizard with it set to configure only.

Follow the directions in the topic “Deploy SAS Visual Analytics Interactively.” When the Select Deployment Type page appears, make sure that you choose **Configure SAS Software**. Make sure that **Install SAS Software** is deselected. For more information, see “Specify Configuration Information” on page 69.

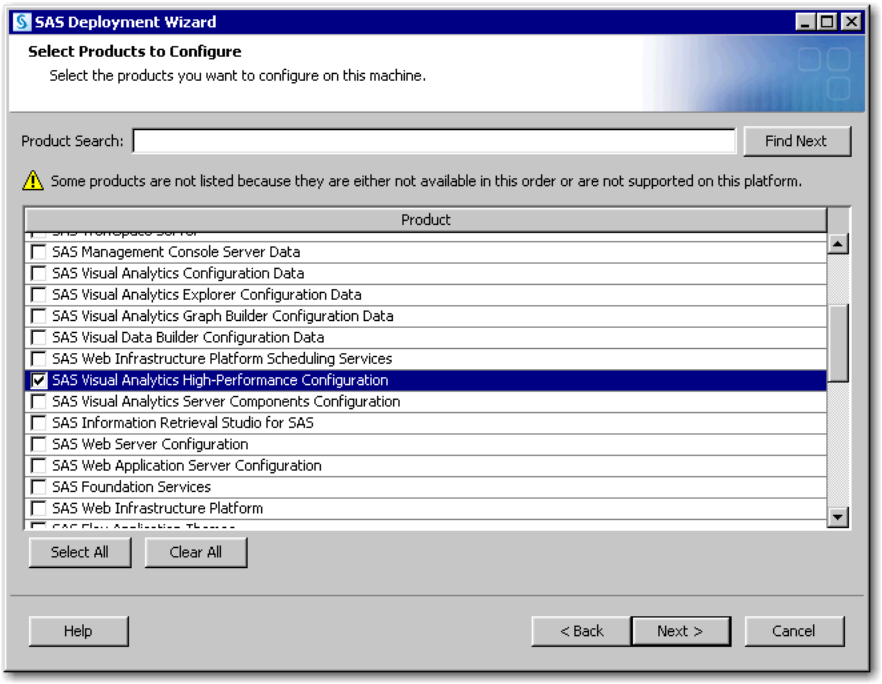
Figure A1.3 *SAS Deployment Wizard Configure Mode*



Note: When prompted for the SAS configuration directory, make sure that you specify the directory that contains your pre-existing SAS Visual Analytics configuration.

When the deployment wizard displays the Select Products to Configure page, it is important that you choose **SAS Visual Analytics High-Performance Configuration**.

Figure A1.4 *SAS Visual Analytics High-Performance Configuration*



6 When the deployment wizard is finished, rebuild the SAS Visual Analytics Administrator application.

For more information, see “Rebuilding the SAS Web Applications” in Chapter 8 of *SAS Intelligence Platform: Middle-Tier Administration Guide* available at `http://support.sas.com/documentation/cdl/en/bimtag/66823/PDF/default/bimtag.pdf`.

7 After you rebuild the SAS Visual Analytics Administrator application, make sure that you also redeploy it. For more information, see “Redeploying the SAS Web Applications” in Chapter 8 of *SAS Intelligence Platform: Middle-Tier Administration Guide* available at `http://support.sas.com/documentation/cdl/en/bimtag/66823/PDF/default/bimtag.pdf`.

8 Make sure that the signature file path for SAS LASR Analytic Server exists on the root node machine.

Appendix 2

Migrating SAS Visual Analytics

Overview of Migrating SAS Visual Analytics

How to Use This Document

This document is designed to be used in conjunction with the *SAS Intelligence Platform: Migration Guide* and earlier sections of the *SAS Visual Analytics: Installation and Configuration Guide*.

What Is Migration and What Is Supported?

Migration is a process in which your SAS content and configuration from an earlier SAS release are upgraded to run in a later SAS release. Same release migration is also possible (for example, 6.4 to 6.4). When performed successfully, migration attempts to preserve as much of your current content and configuration as possible, reduce the number of manual upgrade tasks, and minimize system downtime.

SAS provides automated migration tools: the SAS Migration Utility and the SAS Deployment Wizard. You can migrate with the SAS automated migration tools in the following scenarios:

- Visual Analytics 6.1 to Visual Analytics 6.4
- Visual Analytics 6.2 to Visual Analytics 6.4
- Visual Analytics 6.3 to Visual Analytics 6.4
- Visual Analytics 6.4 to Visual Analytics 6.4

Migration is a one-time operation to deploy Visual Analytics 6.4 and upgrade your version 6.1, 6.2, 6.3, or 6.4 content. By contrast, you can choose to do the following:

- deploy Visual Analytics 6.4 and use promotion to upgrade your content piece by piece.

For more information, see “Comparing Promotion and Migration” in Chapter 1 of *SAS Intelligence Platform: Migration Guide*

- upgrade to Visual Analytics 6.4.

  For more information, see “Upgrading Visual Analytics” on page 143

As with all migrations of SAS software, the system to which you are migrating (target) must have the same number of machines on the same operating systems as the system from which you are migrating (source).

Provided that you are properly licensed, you can change the type of SAS LASR Analytic Server (distributed or non-distributed) in your Visual Analytics environment with the automated migration tools. SAS LASR Analytic Server migration supports the following:

- non-distributed to non-distributed
- distributed to distributed
- non-distributed and distributed to non-distributed and distributed
- non-distributed to distributed

Note: Data migration from distributed to non-distributed is not supported.

A High-Level View of Migration

The following list summarizes the steps required to install SAS 9.4 and migrate earlier SAS version content on a single machine or in a distributed, heterogeneous environment:

1. Review additional documentation.
2. Design your migration.
3. Perform pre-migration tasks.
4. Upgrade your SAS High-Performance Analytics infrastructure.
5. Install SAS Visual Analytics 6.4 and migrate your content.
6. Perform post-migration tasks.

7. Validate your migration.

The sections that follow provide brief descriptions of each of these tasks. Subsequent sections provide the step-by-step instructions that you need to perform.

Step 1: Review Additional Documentation

It is very important to review all the different documents associated with deploying your SAS software. There can be late-breaking information, or instructions that are specific to a particular configuration might be too narrow to be included in the *SAS Visual Analytics: Installation and Configuration Guide*. For more information, see "Review Additional Documentation" on page 122.

Step 2: Design Your Migration

Designing your migration means reviewing the Visual Analytics 6.4 requirements (hardware, software, and migration), comparing them to your current deployment, and developing a plan for how to get your SAS content—your data and configuration—integrated into a Visual Analytics 6.4 system.

Download your software order. In the SAS Software Depot that contains your order, run the SAS Migration Utility to generate a migration analysis report. Using this report, you can analyze every machine in your current Visual Analytics deployment to answer these crucial design questions:

- Which SAS products currently reside on each machine?
- Are there any changes that I need to make to my current deployment before migrating?

Also in your software depot is your SAS Visual Analytics 6.4 software that you deploy in a later step.

For more information, see "Designing Your Migration" on page 123.

Step 3: Perform Pre-migration Tasks

During the pre-migration task phase, using the SAS Migration Utility, you create a migration package that contains your current SAS data and configuration. In a later

step, the SAS Deployment Wizard uses your migration package as input to move your earlier SAS content successfully to Visual Analytics 6.4.

For more information, see “Performing Pre-Migration Tasks” on page 124.

Step 4: Upgrade Your SAS High-Performance Analytics Infrastructure

Follow the steps in the topic, Appendix 2, “Updating the SAS High-Performance Analytics Infrastructure,” in *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide* available at `http://support.sas.com/documentation/solutions/hpainfrastructure/index.html`.

Step 5: Install Visual Analytics 6.4 and Migrate Your SAS Content

In step four you use the SAS Deployment Wizard to install Visual Analytics 6.4 and to migrate your current SAS content and configuration that you packaged using the SAS Migration Utility in step three. During your deployment wizard session, you select the migration option.

For more information, see “Deploying Visual Analytics 6.4 and Migrating Your SAS Content” on page 127.

Step 6: Perform Post-migration Tasks

Step five consists of performing any required manual tasks to complete your migration.

For more information, see “Performing Post-Migration Tasks” on page 128.

Step 7: Validate Your Migration

An important final step in migration is validating that your Visual Analytics 6.4 servers, clients, middle tier, and web clients are functioning and can use migrated content from your earlier Visual Analytics version.

For a discussion of functionality changes in Visual Analytics 6.4, see *SAS Guide to Software Updates*.

For more information, see the "Validating Your Migrated Deployment" on page 130.

Review Additional Documentation

Your review should include these documents:

- QuickStart Guide

  This document is shipped with your SAS software. Follow its instructions.

  The QuickStart Guides are also available online:

  - Windows: `http://support.sas.com/documentation/installcenter/94/win/index.html`
  - UNIX: `http://support.sas.com/documentation/installcenter/94/unx/index.html`
  - z/OS: `http://support.sas.com/documentation/installcenter/94/mvs/index.html`

- software order e-mail (SOE)

  This e-mail is sent to your site to announce the software and detail the order. It also enumerates the initial installation steps and, for SAS 9.4, contains instructions for using Electronic Software Delivery (ESD), if applicable, and the SID file. The SID file contains your site's SAS license (SETINIT).

- SAS order information (SOI)

  After you download your order to an existing SAS Software Depot, you can use the SAS order information (SOI) file to determine what products were in your order and when the order was placed. The SOI is in your SAS Software Depot in **`install_doc/`***order-number*`/soi.html`.

- SAS software summary

  In the same depot location as the SOI, the SAS software summary is a more detailed list of the software included in your order. Unlike the SAS order information sheet, which lists only the software that you have specifically ordered, this document

also describes the included software that supports your order. The software summary is in your SAS Software Depot in **`install_doc/`***order- number*`/ordersummary.html`.

Note: The SAS Deployment Wizard installs only what is listed in the deployment plan. The order summary might list more products than the deployment plan. For more information, see "About Deployment Plans" in Chapter 6 of *SAS Intelligence Platform: Installation and Configuration Guide*.

- SAS 9.4 system requirements

  Available at `http://support.sas.com/resources/sysreq/index.html`

- SAS Visual Analytics system requirements:

  - *System Requirements—SAS Visual Analytics (Distributed Mode)*, available at `http://support.sas.com/documentation/installcenter/en/ikvisanlytofrsr/67467/HTML/default/index.html`
  - *System Requirements—SAS Visual Analytics (Non-distributed Mode)*, available at `http://support.sas.com/documentation/installcenter/en/ikvisanlytofrndmsr/67468/HTML/default/index.html`

- SAS Notes

  Outstanding SAS Notes for alert status installation problems are available at `http://support.sas.com/notes/index.html`

- For a discussion of functionality changes in Visual Analytics 6.4, see the *SAS Guide to Software Updates* available at `http://support.sas.com/documentation/cdl/en/whatsdiff/66129/PDF/default/whatsdiff.pdf`.

Designing Your Migration

Consult the chapter, "Designing Your Migration" in the *SAS Intelligence Platform: Migration Guide*, when designing your Visual Analytics migration.

The tasks required for designing your migration are as follows:

1 Understand the high-level SAS migration requirements.

Consult “High-Level SAS Migration Requirements” in the *SAS Intelligence Platform: Migration Guide*.

2 Determine which SAS products reside on each machine.

Run a SAS migration analysis report on your Visual Analytics server and middle tier machine. (Do not run the migration utility on the SAS High-Performance Analytics environment.)

- To report on SAS Visual Analytics 6.1, use smu93.
- To report on SAS Visual Analytics 6.2 and later, use smu94.

For more information, see “Inventorying Your Current SAS Deployment” in the *SAS Intelligence Platform: Migration Guide*.

3 Obtain a SAS 9.4 deployment plan.

With a current migration analysis report at hand, contact your SAS representative to obtain a valid SAS 9.4 deployment plan for your current SAS deployment.

Note: The SAS Visual Analytics Explorer Server Configuration component in release 6.1 has been merged into SAS Visual Analytics Server Components.

4 Plan SAS user downtime at your site.

You need to schedule a window of time when your SAS deployment is not being used in order to install and configure SAS 9.4 and migrate your SAS content.

Performing Pre-Migration Tasks

Please consult the chapter, “Performing Pre-migration Tasks” in the *SAS Intelligence Platform: Migration Guide*.

Pre-migration tasks are as follows:

1 Back up your current SAS deployment.

This is a best practice to ensure that your current SAS deployment is protected.

For more information, see “Best Practices for Backing Up and Restoring Your SAS Content” in the *SAS Intelligence Platform: System Administration Guide*.

2 Apply required maintenance to any current SAS products.

During your migration design, you identified any current SAS products that require maintenance before you can migrate them.

For more information, see “Apply Any Required SAS Maintenance” in the *SAS Intelligence Platform: Migration Guide* and the *SAS Guide to Software Updates* available at `http://support.sas.com/documentation/cdl/en/whatsdiff/66129/PDF/default/whatsdiff.pdf`.

3 Complete all pre-migration checklists.

The SAS Deployment Wizard prompts you for the required operating system accounts that you used with SAS and for ports to designate for the new SAS 9.4 servers.

For more information, see “Completing the Pre-migration Checklists” in the *SAS Intelligence Platform: Migration Guide*.

4 Add these two new SAS user groups to your user-created SAS LASR libraries in your SAS Visual Analytics 6.1 deployment with SAS Management Console:

- Visual Analytics Data Administrators
- Visual Data Builder Administrators

Also, explicitly grant the Administer permission to the LASR Analytic server and LASR library.

5 Add the new SAS user group, Visual Analytics Data Administrators, to your user-created SAS LASR Analytic Servers in your SAS Visual Analytics 6.1 deployment with SAS Management Console.

6 Create a SAS 9.4 Software Depot.

The SAS Software Depot contains the SAS installation files used by the SAS Deployment Wizard to install and configure SAS 9.4.

For more information, see “Creating SAS Software Depots” in the *SAS Intelligence Platform: Migration Guide*.

7 Create a migration package.

Using the SAS Migration Utility, you create a package containing your current SAS data and configuration that the SAS Deployment Wizard uses.

(Do not run the migration utility on the SAS High-Performance Analytics environment.)

- To package SAS Visual Analytics 6.1, use smu93.
- To package SAS Visual Analytics 6.2 and later, use smu94.

For more information, see “Create the Migration Package” in the *SAS Intelligence Platform: Migration Guide*.

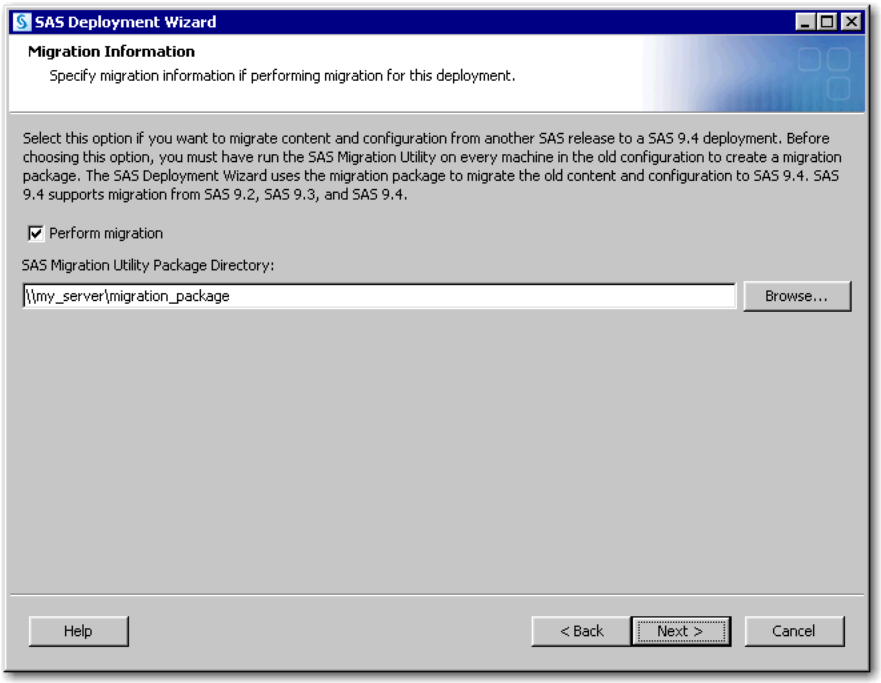
Upgrade Your SAS High-Performance Analytics Infrastructure

Follow the steps in the topic, Appendix 2, “Updating the SAS High-Performance Analytics Infrastructure,” in *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide* available at `http://support.sas.com/documentation/solutions/hpainfrastructure/index.html`.

Deploying Visual Analytics 6.4 and Migrating Your SAS Content

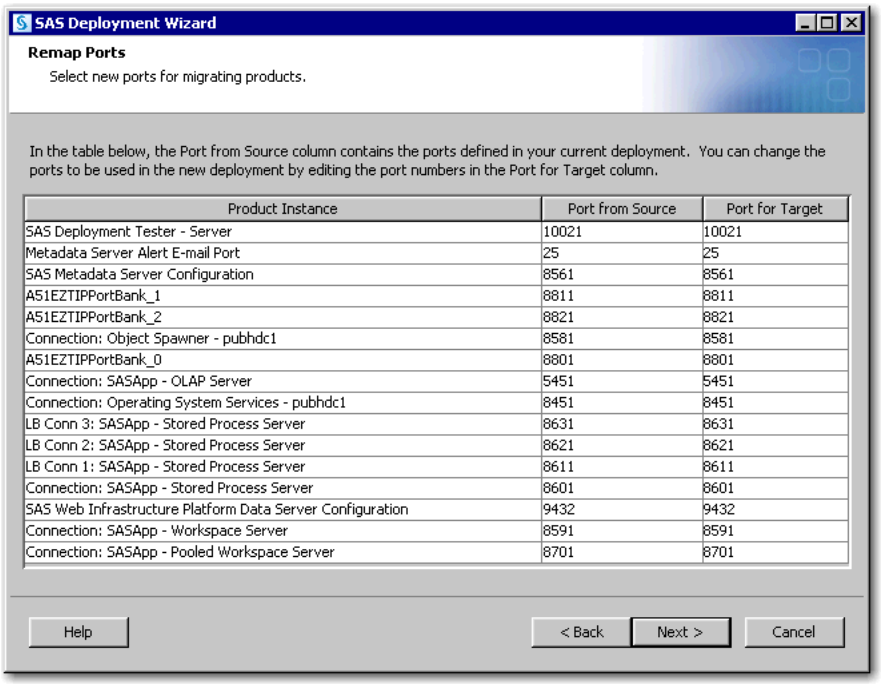
The deploy step when performing a migration is similar to a typical SAS Visual Analytics deployment experience. The major difference is that early in the SAS Deployment Wizard session, you select the **Perform Migration** option:

Figure A2.1 *Migration Information Page*



On the Remap Ports page, by default, the deployment wizard assumes that ports used in your current SAS deployment are identical to the ports that will be used in your SAS Visual Analytics 6.4 deployment. Use this page if you want to specify different ports in your SAS Visual Analytics 6.4 deployment. The deployment wizard displays the port being used in your current SAS deployment (Port from Source column). To specify a different port to use for SAS Visual Analytics 6.4, click the Port for Target cell in the appropriate row for the SAS product and enter the new port number.

Figure A2.2 Remap Ports Page



For more information, follow the directions in Chapter 3, “Deploying the SAS Visual Analytics Server and Middle Tier,” on page 41.

Performing Post-Migration Tasks

After deploying SAS Visual Analytics 6.4 and migrating your content, complete the following post-migration tasks:

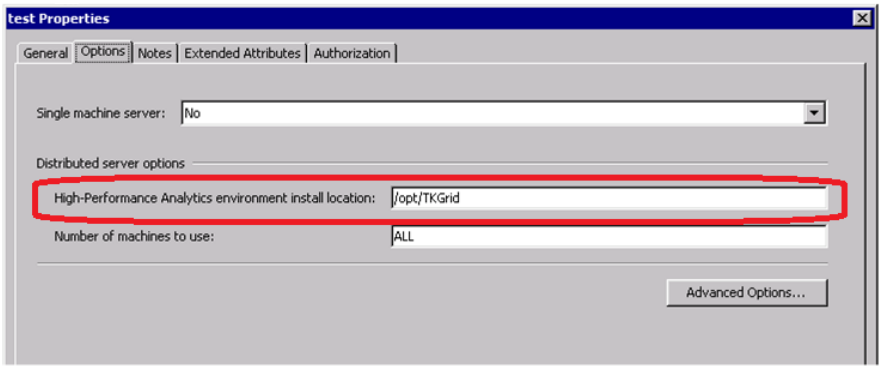
- Starting with Visual Analytics 6.4, you are no longer prompted for the path to the TKGrid Installation on the SAS High-Performance Analytics environment root node host.

  If this location has changed for release 6.4, then after migration you must do the following:

  1 Shut down your SAS LASR Analytic Servers.

For more information, see “Operate a SAS LASR Analytic Server” in Chapter 4 of *SAS Visual Analytics: Administration Guide*.

2 Manually modify the **High-Performance Analytics environment install location** property using SAS Management Console (**Plug-ins** ▶ **Server Manager**, right-click the server, **Properties** ▶ **Options**).



For more information, see “Add a SAS LASR Analytic Server” in Chapter 4 of *SAS Visual Analytics: Administration Guide*

3 Restart your SAS LASR Analytic Servers.

For more information, see “Operate a SAS LASR Analytic Server” in Chapter 4 of *SAS Visual Analytics: Administration Guide*.

- Custom themes must be redeployed. For more information, see the *SAS Theme Designer for Flex: User's Guide* available at `http://support.sas.com/documentation/onlinedoc/va/index.html`.
- Please consult the chapter, “Performing Post-migration Tasks” in the *SAS Intelligence Platform: Migration Guide*.
- Also, review the section, “Migration Considerations for SAS Visual Analytics 6.4” on page 130.

Validating Your Migrated Deployment

Please consult the chapter, “Validating Your SAS Migrated Deployment” in the *SAS Intelligence Platform: Migration Guide*.

Also, review the section, “Validate Your SAS LASR Analytic Server Monitor Deployment” on page 101.

Migration Considerations for SAS Visual Analytics 6.4

Because of the many ways that you can customize SAS Visual Analytics, the automated SAS migration tools cannot fully migrate all user customizations. The following list describes actions that you might need to perform to complete your SAS Visual Analytics 6.4 migration:

- Migration for user-created SAS LASR Analytic Servers is only partially supported. After migration, you must specify their port numbers.
- The metadata labels for the two SAS LASR Analytic Servers created at installation remain the same. If these labels are to be changed in Visual Analytics 6.4, you must do this manually.
- SAS Visual Analytics 6.1 GeoMap data sets are replaced when migrating.
- SAS LASR Analytic Server names are maintained. (The server names automatically created by the SAS Deployment Wizard include the host name. If you choose, you can easily change server names using SAS Management Console.)
- A device limitation “whitelist” is new for SAS Visual Analytics after release 6.1. The previous Visual Analytics 6.1 “blacklist” is migrated forward. When doing a Visual Analytics migration, both the blacklist and the whitelist are migrated. When a database other than Postgres is used, special migration utility properties must be

specified. For more information, see “Product-Specific SAS Migration Utility Properties” in *SAS 9.4 Intelligence Platform: Migration Guide*.

- During migration fromVisual Analytics 6.1, the metadata user groups **Visual Analytics Admin Group** and **Visual Analytics Data Builder Group** are renamed to **Visual Analytics Admin** and **Visual Analytics Data Builder**, respectively.
- Java Virtual Machine (JVM) settings for Visual Analytic web applications are not migrated from version 6.1. The JVM settings used in version 6.4 are the values supplied to the SAS Deployment Wizard during migration.

Appendix 3

Configuration Options by Prompt Level

Overview of Configuration Options by Prompt Level

Shortly after you begin running the SAS Deployment Wizard to interactively install and initially configure SAS, you are asked to choose between three wizard prompting levels:

Express
displays the minimum number of wizard pages needed to complete the SAS configuration.

Typical
displays the basic set of wizard pages needed to complete the SAS configuration.

Custom
displays all the wizard pages needed to complete the SAS configuration.

Figure A3.1 *Select Configuration Prompting Level Page*

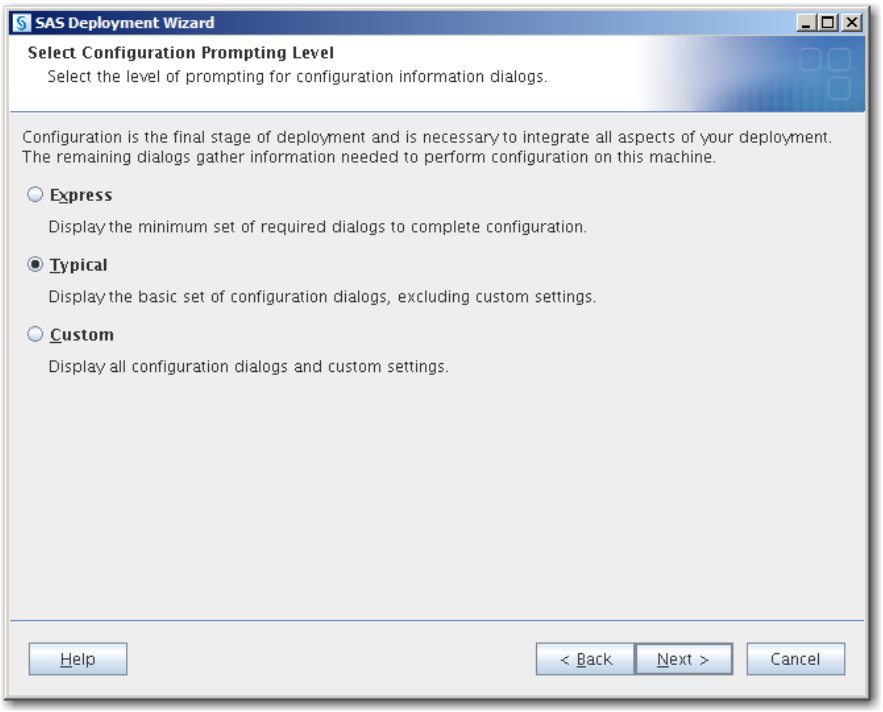


Table A3.1 on page 135 lists the SAS Deployment Wizard pages found in these prompting levels.

Configuration Options by Prompt Level

The following table lists the configuration options and the prompt level in which they appear for the SAS Intelligence Platform only. For a list of the configuration options for SAS Visual Analytics, see "SAS Visual Analytics Configuration Options" on page 45.

Depending on your configuration, you might see differences for the prompt level in which a particular option is displayed. This is one example of a prompt level and configuration option mapping for a sample configuration.

Note: The configuration options that you encounter depend on which SAS products are identified in your deployment plan, and, in multiple machine deployments, the machine that you are currently deploying.

Table A3.1 *Configuration Options by Prompt Level*

Configuration Option in the SAS Deployment Wizard	Prompt Level That Displays the Option		
	Express	Typical	Custom
Select configuration prompting level on page 68*	X	X	X
Specify Configuration Information on page 69*	X	X	X
Migration information on page 70*	X	X	X
Type of deployment accounts on page 70*	X	X	X
Installer account credentials on page 70*	X	X	X
Unrestricted administrator account credentials on page 71*	X	X	X
Trusted user account credentials on page 71*	X	X	X
SAS spawned server account credentials on page 71*	X	X	X
E-mail server host and port name on page 71*	X	X	X
E-mail server sender and recipient e-mail addresses	X	X	X
E-mail server authentication credentials	X	X	X
Web Infrastructure Platform Database Server information on page 72*	X	X	X
SAS Environment Manager Agent ports and host name	X	X	X
SAS Metadata Server port and host name	X	X	X
Anonymous web user account credentials on page 72*	X	X	X
SAS Web Server configuration on page 73*	X	X	X
SAS Web Server: Location of X509 Certificate and RSA Private Key on page 74*	X	X	X

Configuration Option in the SAS Deployment Wizard	Prompt Level That Displays the Option		
	Express	Typical	Custom
SAS Web Application Server ports on page 74*	X	X	X
Web Infrastructure Platform Database JDBC properties on page 75*	X	X	X
SAS Environment Manager administration database configuration on page 76*	X	X	X
SAS Internal Account: SAS Environment Manager service account on page 76*	X	X	X
SAS Environment Manager database configuration on page 77*	X	X	X
Local machine name on page 70*		X	X
Windows options: create shortcuts		X	X
Windows shortcuts scope		X	X
Integrated Windows authentication (IWA) on page 77*		X	X
SAS Metadata Server override backup location		X	X
SAS Metadata Server override service login account credentials		X	X
First user display name and account credentials		X	X
Metadata server encryption level and algorithm on page 78*		X	X
Object spawner port		X	X
Object spawner port bank ports		X	X
SAS Application Server: server context on page 78*		X	X

Configuration Option in the SAS Deployment Wizard	Prompt Level That Displays the Option		
	Express	Typical	Custom
SAS Workspace Server port		X	X
SAS Pooled Workspace Server port on page 78*		X	X
SAS Stored Process Server bridge port		X	X
SAS Stored Process Server MultiBridge connection ports		X	X
SAS OLAP Server port		X	X
Operating System Services Scheduling Server port		X	X
Deployment Tester port and JUnit JAR file		X	X
IP Multicast Version on page 98*		X	X
IP multicast address, UDP port, TTL, authentication token option on page 79*		X	X
Enable anonymous web access on page 72*		X	X
Web application server automatic configuration on page 79*		X	X
Web application server JMS configuration		X	X
Web application server: cache locator port		X	X
Web application server name on page 74*		X	X
Web applications automatic deployment on page 80*		X	X
SAS Web Application Themes host name, protocol, and port		X	X
SAS Content Server repository directory on page 80*		X	X

Configuration Option in the SAS Deployment Wizard	Prompt Level That Displays the Option		
	Express	Typical	Custom
SAS Information Delivery Portal load samples		X	X
SAS Flex Application Themes host name, port, and protocol		X	X
SAS Environment Manager ports and host name		X	X
SAS Deployment Backup and Recovery Tool central vault		X	X
Authentication domain on page 81*			X
Windows options: run as managed scripts or services on page 81*			X
Metadata server librefs			X
Metadata server name and logical name on page 81*			X
Metadata server log filename and invocation options			X
Metadata server foundation repository			X
Metadata server Windows service information			X
SAS spawned server account: enable local security policy settings			X
First user account: enable local security policy settings			X
SAS General Servers group			X
Common directories for logs, users, and temporary space on page 82*			X
Enable FIPS-certified encryption algorithms on page 82*			X
Client-side credentials policy on page 82*			X

Configuration Option in the SAS Deployment Wizard	Prompt Level That Displays the Option		
	Express	Typical	Custom
Object spawner name and host name			X
Object spawner object name in metadata			X
Object spawner invocation options and log filename			X
Object spawner Windows service information			X
SAS Application Server librefs			X
Workspace server name, logical name, and host name			X
Workspace server invocation options and log filename			X
Pooled workspace server name, logical name, and host name on page 78*			X
Pooled workspace server invocation options and log filename			X
Stored process server name, logical name, and host name			X
Stored process server invocation options and log filename			X
Web Infrastructure Platform Database Server Windows service information			X
Operating System Services name and host name			X
Operating System Services Scheduling Server invocation options			X
Deployment Tester host name			X
Deployment Tester Windows service information			X
Query cache library directory and libref on page 82*			X

Configuration Option in the SAS Deployment Wizard	Prompt Level That Displays the Option		
	Express	Typical	Custom
Cache locator host name			X
SAS Environment Manager Agent secure communication on page 83*			X
Choose SAS Environment Manager: Keystore on page 83*			X
SAS BI Web Services authentication method on page 83*			X
SAS BI Web Services Users group			X
SAS Remote Services application host name and port			X
SAS Remote Services Windows service information			X
SAS Remote Services JVM settings on page 84*			X
SAS Web Application Server secure JMS resources			X
SAS Web Application Server configure Internet proxy server on page 84*			X
SAS Web Application Server configure multiple servers on page 91*			X
SAS Web Application Server additional JVM options			X
SAS BI Web Services: completion code values, dynamic prompt validation, execution time-out, and anonymous execution			X
SAS BI Web Services: new web services base namespace, temp directory, and delete temp files			X
SAS Web Infrastructure Platform Database: Data Server on page 85*			X

Configuration Option in the SAS Deployment Wizard	Prompt Level That Displays the Option		
	Express	Typical	Custom
SAS Web Infrastructure Platform: Database Type on page 85*			
SAS Web Infrastructure Platform JES file logging			X
SAS Studio Mid-Tier: Context Root on page 95*			X

* Indicates that more information is available in this document. See the SAS Deployment Wizard online Help for information about all options.

Appendix 4

Managing Your SAS Visual Analytics Deployment

Upgrading Visual Analytics

Overview of Upgrading Visual Analytics

You have two options for upgrading a SAS Visual Analytics 6.3 deployment to release 6.4:

- SAS automatic migration tools

  For more information, see Appendix 2, “Migrating SAS Visual Analytics,” on page 117.

- SAS Deployment Wizard (Update mode)

  For more information, see “Upgrade Visual Analytics” on page 144.

Upgrade Visual Analytics

Follow these steps to upgrade SAS Visual Analytics 6.3 to 6.4 using the SAS Deployment Wizard running in Update mode:

1 Understand how the SAS Deployment Wizard upgrades SAS software.

See, “How the SAS Deployment Wizard Adds, Updates, and Upgrades Software,” in the *SAS Intelligence Platform: Installation and Configuration Guide* available at **http://support.sas.com/documentation/cdl/en/biig/63852/PDF/default/biig.pdf**.

2 Understand how your SAS Visual Analytics 6.2 deployment will change.

See, “SAS Visual Analytics ” in the *SAS Guide to Software Updates* available at **http://support.sas.com/documentation/cdl/en/whatsdiff/66129/PDF/default/whatsdiff.pdf**.

3 Prepare your SAS Visual Analytics 6.2 deployment.

See, “Preparing Your Site for a Software Update” in the *SAS Guide to Software Updates* available at **http://support.sas.com/documentation/cdl/en/whatsdiff/66129/PDF/default/whatsdiff.pdf**.

4 Locate and familiarize yourself with your SAS software order.

See, “Installing Your Software Order” in the *SAS Guide to Software Updates* available at **http://support.sas.com/documentation/cdl/en/whatsdiff/66129/PDF/default/whatsdiff.pdf**.

5 Download your order and create a SAS Software Depot.

See, “Creating SAS Software Depots” in the *SAS Intelligence Platform: Installation and Configuration Guide* available at **http://support.sas.com/documentation/cdl/en/biig/63852/PDF/default/biig.pdf**.

6 Upgrade your SAS High-Performance Analytics infrastructure

Follow the steps in the topic, Appendix 2, “Updating the SAS High-Performance Analytics Infrastructure,” in *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide*.

7 Upgrade SAS Visual Analytics 6.3 to 6.4.

See, “Install and Configure a Software Update” in the *SAS Guide to Software Updates* available at http://support.sas.com/documentation/cdl/en/whatsdiff/66129/PDF/default/whatsdiff.pdf.

8 Perform any post-upgrade deployment tasks.

See, “SAS Visual Analytics 6.4” in the *SAS Guide to Software Updates*.

Remove SAS Visual Analytics Product Configurations

The **Remove Existing Configuration** feature of the SAS Deployment Manager provides an automated way to remove one or more products of a SAS 9.4 configuration from your environment. With this feature, you can remove the configurations of all SAS products or just selected products from a machine.

When removing a product configuration, you must first determine the product’s dependencies. If you remove a product configuration that another product depends on, then the dependent product is not able to function. Therefore, when you remove a product’s configuration, the SAS Deployment Manager requires that you also remove the configurations of any dependent products.

To remove a SAS Visual Analytics product, consult the table in “Identify Dependent SAS Visual Analytics Products” on page 146 to determine the product dependencies. Next, follow the instructions in the Appendix 4, “Removing a SAS Configuration,” in *SAS Intelligence Platform: Installation and Configuration Guide*.

Identify Dependent SAS Visual Analytics Products

Product dependencies are shown in the following table. If you remove the configuration for a product in the left column, then you must also remove the configurations for all of the products that are in the right column opposite that product. For example:

- If you remove Visual Analytics Hub, then you do not need to remove any other products. No products depend on Visual Analytics Hub.
- If you remove Visual Analytics High-Performance Configuration, then you must also remove the following dependent products: Visual Analytics Services and Visual Analytics Administrator.

Note: Remove SAS Visual Analytics products in the opposite order in which you deployed them. For more information see, “Installation Order Rules for Multiple Machine Deployments” on page 51.

Table A4.1 *Dependencies in SAS Visual Analytics*

Product	Dependent Products*
Visual Analytics Extensions for Services	None
Visual Analytics Explorer Configuration Data	None
Visual Analytics Configuration Data	None
Visual Analytics Server Components Configuration	Application Server Context
Visual Analytics Hub	None
Visual Analytics Explorer	None
Visual Analytics Designer	None

Product	Dependent Products*
Visual Analytics Viewer	None
Visual Analytics High-Performance Configuration	Visual Analytics Services Visual Analytics Administrator
Visual Analytics Report Viewer	None
Visual Analytics Administrator	None
Visual Data Builder	None
Search Interface to SAS Content	Visual Analytics Hub
Visual Analytics Services	Visual Analytics Hub Visual Analytics Designer Visual Analytics Explorer Visual Analytics Report Viewer Visual Analytics Administrator Visual Data Builder
SAS Web Application Server	Visual Analytics Hub Visual Analytics Designer Visual Analytics Explorer Visual Analytics Report Viewer Visual Analytics Services Visual Analytics Administrator Visual Data Builder

Product	Dependent Products*
Web Infrastructure Platform	Visual Analytics Extensions for Services Visual Analytics Designer Visual Analytics Explorer Visual Analytics Hub Visual Analytics Report Viewer Visual Data Builder Visual Analytics Administrator Visual Analytics Services
Pooled Workspace Server	Visual Analytics Explorer Server Configuration
Application Server Context	Visual Analytics High-Performance Configuration Visual Analytics Administrator Visual Data Builder
Workspace Server	Visual Analytics Administrator Visual Data Builder
DATA Step Batch Server	Visual Analytics Administrator
Web Infrastructure Platform Data Server	Visual Analytics Services Visual Data Builder

* These products depend on the product in the left column. Therefore, they must be removed if the product in the left column is removed.

When you remove a product's configuration, the SAS Deployment Manager checks to see whether your deployment plan includes any products that depend on that product. If dependent products exist, and if you have not selected those products for removal, then the SAS Deployment Manager prompts you to remove them.

Change Autoload Location for the Public LASR Library

In SAS Visual Analytics 6.3, the default directory for SAS Autoload has changed to the following: ***configuration-directory*/Levn/AppData/SASVisualAnalytics/VisualAnalyticsAdministrator/Autoload**

Your previous configured SAS Autoload directory still exists and is your preferred Autoload directory. If you want to update your environment to use the newly created default, update the `VA.Autoload.Location` property using the SAS Management Console. For more information, see “Autoload” in the *SAS Visual Analytics: Administration Guide*.

Glossary

browser
See web browser

co-located data provider
a distributed data source, such as SAS Visual Analytics Hadoop or a third-party vendor database, that has SAS High-Performance Analytics software installed on the same machines. The SAS software on each machine processes the data that is local to the machine or that the data source makes available as the result of a query.

data set
See SAS data set

data warehouse
a collection of data that is extracted from one or more sources for the purpose of query, reporting, and analysis. Data warehouses are generally used for storing large amounts of data that originates in other corporate applications or that is extracted from external data sources.

encryption
the act or process of converting data to a form that is unintelligible except to the intended recipients.

Extensible Markup Language
a markup language that structures information by tagging it for content, meaning, or use. Structured information contains both content (for example, words or numbers) and an indication of what role the content plays. For example, content in a section heading has a different meaning from content in a database table.

foundation services
See SAS Foundation Services

grid host
the machine to which the SAS client makes an initial connection in a SAS High-Performance Analytics application.

Hadoop Distributed File System
a framework for managing files as blocks of equal size, which are replicated across the machines in a Hadoop cluster to provide fault tolerance.

HDFS
See Hadoop Distributed File System

identity
See metadata identity

Integrated Windows authentication
a Microsoft technology that facilitates use of authentication protocols such as Kerberos. In the SAS implementation, all participating components must be in the same Windows domain or in domains that trust each other.

Internet Protocol Version 6
a protocol that specifies the format for network addresses for all computers that are connected to the Internet. This protocol, which is the successor of Internet Protocol Version 4, uses hexadecimal notation to represent 128-bit address spaces. The format can consist of up to eight groups of four hexadecimal characters, delimited by colons, as in FE80:0000:0000:0000:0202:B3FF:FE1E:8329. As an alternative, a group of consecutive zeros could be replaced with two colons, as in FE80::0202:B3FF:FE1E:8329.

IPv6
See Internet Protocol Version 6

IWA
See Integrated Windows authentication

JAR file
a Java Archive file. The JAR file format is used for aggregating many files into one file. JAR files have the file extension .jar.

Java
a set of technologies for creating software programs in both stand-alone environments and networked environments, and for running those programs safely. Java is an Oracle Corporation trademark.

Java Database Connectivity
a standard interface for accessing SQL databases. JDBC provides uniform access to a wide range of relational databases. It also provides a common base on which higher-level tools and interfaces can be built.

Java Development Kit
a software development environment that is available from Oracle Corporation. The JDK includes a Java Runtime Environment (JRE), a compiler, a debugger, and other tools for developing Java applets and applications.

JDBC
See Java Database Connectivity

JDK
See Java Development Kit

localhost
the keyword that is used to specify the machine on which a program is executing. If a client specifies localhost as the server address, the client connects to a server that runs on the same machine.

login
a SAS copy of information about an external account. Each login includes a user ID and belongs to one SAS user or group. Most logins do not include a password.

Message Passing Interface
is a message-passing library interface specification. SAS High-Performance Analytics applications implement MPI for use in high-performance computing environments.

metadata identity
a metadata object that represents an individual user or a group of users in a SAS metadata environment. Each individual and group that accesses secured resources on a SAS Metadata Server should have a unique metadata identity within that server.

metadata object
a set of attributes that describe a table, a server, a user, or another resource on a network. The specific attributes that a metadata object includes vary depending on which metadata model is being used.

middle tier
in a SAS business intelligence system, the architectural layer in which web applications and related services execute. The middle tier receives user requests, applies business logic and business rules, interacts with processing servers and data servers, and returns information to users.

MPI
See Message Passing Interface

object spawner
a program that instantiates object servers that are using an IOM bridge connection. The object spawner listens for incoming client requests for IOM services. When the spawner receives a request from a new client, it launches an instance of an IOM server to fulfill the request. Depending on which incoming TCP/IP port the request

was made on, the spawner either invokes the administrator interface or processes a request for a UUID (Universal Unique Identifier).

planned deployment
a method of installing and configuring a SAS business intelligence system. This method requires a deployment plan that contains information about the different hosts that are included in the system and the software and SAS servers that are to be deployed on each host. The deployment plan then serves as input to the SAS Deployment Wizard.

root node
in a SAS High-Performance Analytics application, the role of the software that distributes and coordinates the workload of the worker nodes. In most deployments the root node runs on the machine that is identified as the grid host. SAS High-Performance Analytics applications assign the highest MPI rank to the root node.

SAS Application Server
a logical entity that represents the SAS server tier, which in turn comprises servers that execute code for particular tasks and metadata objects.

SAS authentication
a form of authentication in which the target SAS server is responsible for requesting or performing the authentication check. SAS servers usually meet this responsibility by asking another component (such as the server's host operating system, an LDAP provider, or the SAS Metadata Server) to perform the check. In a few cases (such as SAS internal authentication to the metadata server), the SAS server performs the check for itself. A configuration in which a SAS server trusts that another component has pre-authenticated users (for example, web authentication) is not part of SAS authentication.

SAS configuration directory
the location where configuration information for a SAS deployment is stored. The configuration directory contains configuration files, logs, scripts, repository files, and other items for the SAS software that is installed on the machine.

SAS data set
a file whose contents are in one of the native SAS file formats. There are two types of SAS data sets: SAS data files and SAS data views.

SAS Deployment Manager
a cross-platform utility that manages SAS deployments. The SAS Deployment Manager supports functions such as updating passwords for your SAS deployment, rebuilding SAS web applications, and removing configurations.

SAS Deployment Wizard
a cross-platform utility that installs and initially configures many SAS products. Using a SAS installation data file and, when appropriate, a deployment plan for its initial input, the wizard prompts the customer for other necessary input at the start of the session, so that there is no need to monitor the entire deployment.

SAS Foundation Services
a set of core infrastructure services that programmers can use in developing distributed applications that are integrated with the SAS platform. These services provide basic underlying functions that are common to many applications. These functions include making client connections to SAS application servers, dynamic service discovery, user authentication, profile management, session context management, metadata and content repository access, information publishing, and stored process execution.

SAS installation data file
See SID file

SAS installation directory
the location where your SAS software is installed. This location is the parent directory to the installation directories of all SAS products. The SAS installation directory is also referred to as SAS Home in the SAS Deployment Wizard.

SAS IOM workspace
in the IOM object hierarchy for a SAS Workspace Server, an object that represents a single session in SAS.

SAS Metadata Server
a multi-user server that enables users to read metadata from or write metadata to one or more SAS Metadata Repositories.

SAS Pooled Workspace Server
a SAS Workspace Server that is configured to use server-side pooling. In this configuration, the SAS object spawner maintains a collection of workspace server processes that are available for clients.

SAS Software Depot
a file system that consists of a collection of SAS installation files that represents one or more orders. The depot is organized in a specific format that is meaningful to the SAS Deployment Wizard, which is the tool that is used to install and initially configure SAS. The depot contains the SAS Deployment Wizard executable, one or more deployment plans, a SAS installation data file, order data, and product data.

SAS Stored Process Server
a SAS IOM server that is launched in order to fulfill client requests for SAS Stored Processes.

SAS Workspace Server
a SAS IOM server that is launched in order to fulfill client requests for IOM workspaces.

SASHDAT file
the data format used for tables that are added to HDFS by SAS. SASHDAT files are read in parallel by the server.

SASHOME directory
the location in a file system where an instance of SAS software is installed on a computer. The location of the SASHOME directory is established at the initial installation of SAS software by the SAS Deployment Wizard. That location becomes the default installation location for any other SAS software that is installed on the same computer.

server context
a SAS IOM server concept that describes how SAS Application Servers manage client requests. A SAS Application Server has an awareness (or context) of how it is being used and makes decisions based on that awareness. For example, when a SAS Data Integration Studio client submits code to its SAS Application Server, the server determines what type of code is submitted and directs it to the correct physical server for processing (in this case, a SAS Workspace Server).

server description file
a file that is created by a SAS client when the LASR procedure executes to create a server. The file contains information about the machines that are used by the server. It also contains the name of the server signature file that controls access to the server.

SID file
a control file containing license information that is required in order to install SAS.

single sign-on
an authentication model that enables users to access a variety of computing resources without being repeatedly prompted for their user IDs and passwords. For example, single sign-on can enable a user to access SAS servers that run on different platforms without interactively providing the user's ID and password for each platform. Single sign-on can also enable someone who is using one application to launch other applications based on the authentication that was performed when the user initially logged on.

SOE
See software order e-mail

software order e-mail
an e-mail message, sent to a customer site, that announces arrival of the software and describes the order. It explains the initial installation steps and might also contain instructions for using Electronic Software Delivery (ESD), if applicable.

spawner
See object spawner

SSO
See single sign-on

trusted user
a privileged service account that can act on behalf of other users on a connection to the metadata server.

unrestricted identity
a user or group that has all capabilities and permissions in the metadata environment due to membership in the META: Unrestricted Users Role (or listing in the adminUsers.txt file with a preceding asterisk).

update mode
an operating state of the SAS Deployment Wizard in which users are required to install software updates before they can perform any other deployment tasks. The SAS Deployment Wizard automatically goes into update mode when it determines that the current SAS order contains new versions or maintenance updates to the deployed products in a given SAS installation directory.

warehouse
See data warehouse

web application
an application that is accessed via a web browser over a network such as the Internet or an intranet. SAS web applications are Java Enterprise Edition (JEE) applications that are delivered via web application archive (WAR) files. The applications can depend on Java and non-Java web technologies.

web authentication
a configuration in which users of web applications and web services are verified at the web perimeter, and the metadata server trusts that verification.

web browser
a software application that is used to view web content, and also to download or upload information. The browser submits URL (Uniform Resource Locator) requests to a web server and then translates the HTML code into a visual display.

worker node
in a SAS High-Performance Analytics application, the role of the software that receives the workload from the root node.

workspace
See SAS IOM workspace

XML
See Extensible Markup Language

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