

Helpful Hints for Transitioning to SAS® 9.4

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ABSTRACT

A group tasked with testing SAS® software from the customer perspective has gathered a number of helpful hints for SAS® 9.4 that will smooth the transition to its new features and products. These hints will help with the "Huh?" moments that crop up when you are getting oriented and will provide short, straightforward answers. And we also share insights about changes in your order contents. Gleaned from extensive multi-tier deployments, SAS® Customer Experience Testing shares insiders' practical tips to ensure you are ready to begin your transition to SAS® 9.4. The target audience for this paper is primarily system administrators who will be installing, configuring, and administering the SAS 9.4 environment.

INTRODUCTION

New migration features? Environment management and monitoring? Clustering metadata and middle-tier servers for failover? SAS middle-tier servers? Backup and recovery?! How do I prepare for my transition to SAS 9.4? The Customer Experience Testing group at SAS is tasked with testing SAS software from the customer perspective. This group has gathered a number of helpful hints that will smooth your transition to SAS 9.4. These hints will help with the "Huh?" moments that crop up when getting oriented and provide short upfront answers. This paper also shares insights about changes in your order contents. Gleaned from extensive multi-tier deployments, SAS Customer Experience Testing shares insiders' practical tips to ensure you are ready to begin your transition to SAS 9.4.

The target audience for this paper is primarily system administrators who will be installing, configuring, and administering the SAS 9.4 environment.

WHAT'S NEW IN SAS 9.4?

There are many new features in SAS 9.4. For a quick, convenient overview of new functionality, enhanced features, and new products that you might use in SAS 9.4, see *What's New in SAS® 9.4* available at <http://support.sas.com/documentation/whatsnew/>.

This paper is not intended to cover all of the new features. Instead, this paper highlights some of the changes to assist with your transition to SAS 9.4.

SAS MIDDLE-TIER SERVERS

The middle-tier software includes the SAS® Web Server for use as an HTTP server and the SAS® Web Application Server for running SAS web applications. A third-party web application server is no longer needed. The SAS Web Server is an HTTP server and is based on the Pivotal Web Server, formerly known as the VMware vFabric Web Server. The SAS Web Application Server is a lightweight server that provides enterprise-class features for running SAS web applications. The SAS deployment tools configure these servers automatically. The deployment tools simplify the configuration of vertical and horizontal clustering as well as HTTP load balancing.

The second maintenance release for SAS 9.4 includes a new estimated system size feature. The SAS® Deployment Wizard prompts for a size estimate (small, medium, and large) and then uses your sizing selection as a tuning parameter during the configuration of the SAS Web Application Server. This option appears only during SAS® Metadata Server configuration and applies to all machines configured with this metadata server. For more information, see Appendix 1, "Initial Sizing and Tuning Configuration Options for Deployments," in *SAS 9.4® SAS Web Applications: Tuning for Performance and Scalability*.

The SAS Web Application Server stores its license file in the `/etc/opt/vmware/vfabric` folder on UNIX. This folder should be created with Write access prior to starting your deployment. If this folder is not created or the SAS Installer ID does not have correct permissions, a failure occurs while configuring the SAS Web Application Server. While the error message is useful in providing steps to rectify the

problem and resume the configuration process, this failure can be avoided. See your Pre-Installation Checklist for details.

When deploying SAS software on multiple machines, it is possible to choose to configure a single server or multiple managed servers for the middle tier. Starting with the second maintenance release for SAS 9.4, the same selection is enforced across each middle tier during software updates. This feature does not change the behavior of new or migrated environments.

For additional details, see *SAS 9.4® Intelligence Platform: Middle-Tier Administration Guide*.

SAS WEB INFRASTRUCTURE PLATFORM DATA SERVER

The SAS® Web Infrastructure Platform Data Server is included in your deployment for use as transactional storage by SAS middle-tier software and some SAS solutions software. The SAS Web Infrastructure Platform Data Server is a repackaged PostgreSQL database system that is provided and deployed by SAS. The SAS Web Infrastructure Platform Data Server is the default database server for the SAS® Web Infrastructure Platform Services Database. The SAS Web Infrastructure Platform Data Server replaces the SAS® Framework Data Server from SAS 9.3 and the SAS® Table Server from SAS 9.2.

During configuration, only one port is required to configure the default SAS Web Infrastructure Platform Data Server. However, there could be 40 to 90 or more "postgres" processes running, each requiring additional ports. These additional processes are created when the original Postgres process (through which all connections are first established) forks (or spawns) a new Postgres process to handle an individual client connection. For more information, see the PostgreSQL 9.3.1 documentation.

Some products and solutions might create a separate database instance in the embedded PostgreSQL database. Each database instance runs on a separately defined port. In the SAS documentation, these separate databases are referred to as Data Servers.

Use caution when using special characters in the password for any users defined for the databases, such as SAS Web Infrastructure Platform Data Server, SAS® Data Management Data Server, and so on. A password with special characters might result in failures, and the product will not be usable. Additional information about the supported special characters is available in the PostgreSQL documentation (see [Recommended Reading](#)).

While the SAS Web Infrastructure Platform Data Server is always included, you can choose an alternative database for the SAS Web Infrastructure Platform Services Database. For details about the alternative databases supported for the SAS Web Infrastructure Platform Services Database, see "Configuring an Alternative Database for SAS Web Infrastructure Platform Services" in the *SAS® 9.4 Intelligence Platform: Installation and Configuration Guide*.

For more information about SAS Web Infrastructure Platform Data Server, see *SAS® 9.4 Intelligence Platform: Middle-Tier Administration Guide*.

SAS® ENVIRONMENT MANAGER

SAS® Environment Manager is a new monitoring and management system for SAS deployments. SAS Environment Manager provides a web-based monitoring solution. Features include automatic resource discovery, monitoring of remote systems, personal and role-based dashboards, alerting, and visualization. The application provides web-based management, operation, and proactive monitoring of servers on both the middle tier and the SAS server tier. SAS Environment Manager incorporates some VMware Hyperic technology that offers enterprise-class operational features.

The SAS® Environment Manager Agent is a process that runs on each machine to perform various functions, such as gathering resource metrics and auto-discovery of software components that run on its platform. This process returns the information to the SAS Environment Manager Server. An agent must be installed and configured on a tier before SAS Environment Manager can monitor it. The agent location is driven by the deployment plan (also called the `plan.xml` file). Check your plan file to ensure that the SAS Environment Manager Agent is deployed on each machine that you intend to monitor with SAS Environment Manager.

SAS Environment Manager can also provide information about SAS servers and instances that are discovered by an agent, including services or processes, but that are not part of your environment. This behavior can occur when there is more than one SAS deployment running on a given machine.

In addition to the agents, the SAS Web Application Server and the SAS Environment Manager Server must be running in order to use SAS Environment Manager. The SAS Environment Manager Server is actually a separate process from any of the `SASServer[X]` managed servers. It is started by using `SAS-Configuration-directory/Lev1/Web/SASEnvironmentManager/server-5.0.0-EE/bin/hq-server.sh`. Also, for the SAS plug-ins to work on the Administration page, `SASServer2` must be running.

The SAS Environment Manager Server and Agent are not supported on the z/OS platform. SAS services running on z/OS cannot be monitored by SAS Environment Manager. This restriction is documented in the *System Requirements--SAS® Environment Manager 2.1*.

For more information about SAS Environment Manager, see *SAS® Environment Manager: User's Guide*.

SAS® DEPLOYMENT AGENT

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 and administration activities such as creating new servers and clustering. The SAS Deployment Agent is required for some administration activities such as creating new servers, configuring middle tier clustering, and using the SAS Deployment Backup and Recovery Tool.

Do not remove the SAS Deployment Agent when unconfiguring a SAS deployment. The SAS Deployment Agent runs outside the context of the SAS configuration and should not be removed unless you intend to uninstall all of your SAS deployment. For example, if you remove the SAS Deployment Agent Service on a Windows server, the SAS Deployment Agent Service fails to start during the subsequent configuration steps in the SAS Deployment Wizard because the service does not exist.

Before uninstalling SAS or deleting the SAS installation directory, run the SAS Deployment Manager task to stop the SAS Deployment Agent service or process. You can also stop the agent on Windows by stopping the service or on UNIX with the `agent.sh` script.

Note that the SAS Deployment Agent and the SAS Environment Manager Agent are separate entities. These agents serve different purposes and are unrelated.

For more information, see “SAS Deployment Agents” in *SAS 9.4 Intelligence Platform: Installation and Configuration Guide*.

DEPLOYMENT BACKUP AND RECOVERY

The new SAS® Deployment Backup and Recovery Tool provides an integrated and automated method for synchronized backup and recovery of SAS content across multiple tiers and machines. The SAS Deployment Backup and Recovery Tool includes administrative commands that can display the current backup configuration, alter the configuration, and run backups manually. The SAS Deployment Agent is required for using this tool.

Although named the SAS Deployment Backup and Recovery Tool, this tool does not create a backup of an entire deployment. Instead, the primary focus is to backup content and customizations in the configuration folder. The tool makes copies of the following items:

- configuration files and repositories for the SAS metadata server
- context configuration directories (e.g. SASApp) for the SAS application server
- SAS® Content Server repository
- SAS Web Infrastructure Platform Data Server databases
- additional directories under the configuration directory if custom directories are configured

For details, see “What is Not Backed Up?” in *SAS® 9.4 Intelligence Platform: System Administration Guide*.

Make sure that the user who is designated to perform backups has permissions to create the backup folder. On UNIX, this user is the SAS Installer user for each server and middle-tier machine. The first time a backup is run, the SAS Deployment Backup and Recovery Tool creates a `Backup` subfolder in the `Lev[n]` location. If the user designated to perform backups does not have permissions to create this subfolder, errors can occur.

The SAS Deployment Backup and Recovery Tool includes a middle tier component. In SAS 9.4 deployments with multiple middle tier machines, this component is deployed to each middle tier machine by default.

Starting in the second maintenance release for SAS 9.4, the new recovery method, SAS-RECOVER-OFFLINE, can be run while many of the servers in the deployment are offline. The recovery method can also be run while the servers are up, but a successful run will take many hours to complete if the following conditions are met:

- SAS Environment Manager is using the SAS Web Infrastructure Platform Database (PostgreSQL) for its database
- SAS Environment Manager Server is running during the recovery

To perform a recovery the second time from an existing backup, the `FORCED` option must be specified. However, this option might return a null pointer exception if it is the first option in the backup configuration file. To correct both issues, create the file with `FORCED` as the second option.

For details on using the SAS Deployment Backup and Recovery Tool, see “Using the Deployment Backup and Recovery Tool” in *SAS® 9.4 Intelligence Platform: System Administration Guide*.

METADATA SERVER CLUSTERING

The new metadata server clustering feature provides redundancy and high availability of the SAS Metadata Server, which is a core component of the SAS infrastructure. Clustering ensures that the metadata server will continue to operate if a server host machine fails.

For more information about metadata server clustering, see “Using Metadata Server Clustering” in *SAS® 9.4 Intelligence Platform: System Administration Guide*.

MIDDLE-TIER CLUSTERING

The SAS Deployment Wizard has been enhanced to simplify clustering the SAS Web Application Server. With the enhancements, 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).

The SAS Deployment Wizard Cluster Configuration option allows you to select a middle tier machine to cluster when you have multiple machines with SAS Web Application Servers and SAS web applications.

Not all products support clustering at this time. Products that do not support middle-tier clustering run on the master node in the cluster but are not deployed on the cluster nodes. If the master node is not available, then those products are not available for use. For more information, see *SAS® 9.4 Guide to Software Updates*. Beginning in the second maintenance release for SAS 9.4, the `Instructions.html` for the middle tier machine(s) will list the clusterable SAS web applications.

For more information about middle-tier clustering, see *SAS® 9.4 Intelligence Platform: Middle-Tier Administration Guide*.

MIGRATION

Migration to SAS 9.4 is supported from SAS 9.2, SAS 9.3 and SAS 9.4. Specific baseline requirements might apply for each release of products. For more information about migration requirements, see the Focus Area for Migration at <http://support.sas.com/rnd/migration/index.html>.

In the first maintenance release for SAS 9.4, a feature was added to the SAS® Migration Utility that identifies previous releases of SAS products that currently cannot be migrated directly to SAS 9.4. The Migration Utility Analysis Report identifies which products to update you need to update in order to prepare them for migration. The new Migration Version Analysis section shows the product releases that are not supported for migration. If a product is listed in the Migration Version Analysis section, it might need to be migrated or updated to an interim release before migrating to a SAS 9.4 system.

The information in the Migration Version Analysis is limited to target systems of 9.4M1 (and later) and applies only to software that has already shipped on SAS 9.4.

At this time, the migration version analysis does not have any messaging for products that will never support migration to a future release.

When running the SAS Migration Utility from `support.sas.com` to analyze an environment prior to requesting an order for SAS 9.4, the information presented in the Analysis Report can give the impression that migration to SAS 9.4 is supported when it is not. The report reflects information for product releases that shipped at the time the SAS Migration Utility was downloaded. For example, if your existing deployment includes a SAS solution that is not available at SAS 9.4, the Migration Version Analysis section of the report does not include the products from that solution in its analysis. You do not receive a warning that a SAS 9.4 release of the solution is not available. However, later in the Details section of the report, you might see messages indicating that migration is available for individual products in that solution. The bottom line is while migration to SAS 9.4 will be supported, you cannot migrate this solution to SAS 9.4 because that solution has not been released. Using the SAS Migration Utility from the SAS Software Depot for your SAS 9.4 order will ensure you have up-to-date version information for all products in your order.

In the remainder of the Analysis Report, some products show a message with a green check mark indicating that “migration is supported for this version” even if the product is listed in the Migration Version Analysis section with unsupported versions. In such a case, disregard the “migration is supported” message. The Migration Version Analysis takes precedence.

If the Migration Version Analysis section shows a product with unsupported versions on any machine in the deployment, then migration using the SAS Migration Utility is not supported. In order to migrate using the SAS Migration Utility, products on all machines of the deployment must be supported for migration.

Starting with the second maintenance release for SAS 9.4, the SAS Deployment Wizard prevents users from proceeding with a SAS Migration Utility package for an unsupported migration based on migration version analysis incompatibilities. The Migration Version Analysis section in the Migration Utility Analysis Report identifies any incompatibilities with the source system’s configured version. By reviewing this section, you can identify any problems before encountering issues in the SAS Deployment Wizard. If the SAS Deployment Wizard detects incompatibilities on any tier, the wizard will prevent migration. Always check the migration version analysis carefully for all tiers in your configuration to confirm that your migration can succeed.

For more information about the new Migration Version Analysis feature, see *SAS® 9.4 Intelligence Platform: Migration Guide*.

When creating a migration package for a SAS 9.4 deployment using the SAS Migration Utility, all servers (including the SAS Web Application Server) on all tiers must be running. Otherwise, a failure might occur during package creation. For example, the SAS Migration Utility might fail on the middle tier machine when SAS® Visual Data Builder connects to the SAS Web Infrastructure Platform to migrate its query database.

The `ordersummary.html` file (located in the SAS Software Depot) now lists the maintenance release number for a product. This information can help you determine the target release numbers associated with the software in your SAS Software Order. This information is needed when reviewing and evaluating the Migration Version Analysis section in the Migration Utility Analysis Report.

The SAS Migration Utility that creates packages from SAS 9.3 configurations (smu93) and SAS 9.2 configurations (smu92) requires a 32-bit JRE. When launched on UNIX, this utility searches in many

typical locations for Java. If a 32-bit JRE is not found, specify the location of the JRE for the SMU_JAVA environment variable using the `EXPORT` command (for example `export SMU_JAVA=path-to-32bit-jre`) and then run the SAS Migration Utility.

If at any point during the execution of the SAS Deployment Wizard you are prompted to choose a SAS Application Server to manage an object being configured, do not choose SASMeta. The application server context SASMeta is for use by the metadata server only. In some cases, the SAS Deployment Wizard might have SASMeta selected as the default. You must change this selection to an appropriate application server context for the component being configured. The *SAS® 9.4 Intelligence Platform: Migration Guide* includes several warnings to change the SAS Application Server Context if it is set to SASMeta. Starting with the second maintenance release for SAS 9.4, improvements have been made to remove SASMeta as a dependency selection in the SAS Deployment Wizard.

UPDATING OR UPGRADING 9.4

When updating or upgrading an existing SAS 9.4 deployment, if the SAS Deployment Wizard determines that there is newer SAS software in the current order than what is already deployed, the wizard automatically goes into Update mode. During the update process, be aware of these situations:

- During the update process, the SAS Deployment Wizard will install and use hot fixes that are flagged as required at upgrade time. If you must run the update process again because of an incomplete prior attempt, the SAS Deployment Wizard might find that the software is updated and will not apply the hot fixes. You can work around this issue by installing the hot fix manually. Complete the steps outlined in *SAS Deployment Wizard and SAS Deployment Manager 9.4: User's Guide*.
- In an environment with signed certificates in the SAS Private JRE, any signed certificates need to be re-imported in the SAS Private JRE after the updates are installed but before these updates are configured during the update process.
- When upgrading an existing SAS offering and a new component is included, the SAS Deployment Wizard will first perform the update. You must then run the SAS Deployment Wizard a second time to add new components. For example, if the existing deployment does not include SAS® Visual Analytics but the offering is being updated to a release that does include SAS Visual Analytics, the SAS Deployment Wizard must be run a second time to add SAS Visual Analytics and related components.

For an explanation of the process for software updates, including upgrading to a new product release, applying a SAS (Foundation) maintenance release, or applying a product-specific maintenance release, see the *SAS 9.4 Guide to Software Updates*.

ORDER CONTENT CHANGES

With SAS 9.4, the contents of your order could change. Here are a few of the more common changes:

SAS® Data Management Standard replaces the SAS® Enterprise Data Integration.

SAS has fully integrated the DataFlux® suite of data quality, data integration, data governance, and master data management solutions. The newly branded SAS® DataFlux® products are now being combined into software offerings that include other SAS products. As a result of these changes, SAS Data Management Standard replaces SAS Enterprise Data Integration. Note that while SAS Enterprise Data Integration Server included SAS/SHARE® software, SAS Data Management Standard does not. Therefore, your source environment might have SAS/SHARE, but your migrated environment will not. Contact your SAS account representative if you need to continue to license SAS/SHARE at SAS 9.4.

SAS® Enterprise BI Server now supports SAS® Mobile BI on iPad and Android.

If you license SAS Enterprise BI Server, you can now use the SAS Mobile BI app on the iPad and Android to view basic SAS Web Report Studio relational reports. You can manage mobile access permissions through the use of whitelisting and blacklisting devices. Beginning in the 4.4 release, the SAS Enterprise BI offering includes several SAS® Visual Analytics products and components in support of mobile reporting. However, this inclusion does not imply that SAS Visual Analytics is licensed nor does it mean that the full SAS Visual Analytics offering is included. Only the components required to use

Enterprise BI with the SAS Mobile BI app are included. When deploying SAS Enterprise BI, the SAS Deployment Wizard will prompt for information related to these software components. The `Instructions.html` file for the SAS Enterprise BI middle tier might also include a SAS Visual Analytics section. This section is purely informational unless you also license SAS Visual Analytics. For more information, see the “Viewing SAS Web Report Studio Reports on Mobile Devices” in *SAS 9.4 Intelligence Platform: Middle-Tier Administration Guide*.

SAS/SECURE™ software is included with SAS Foundation beginning in SAS 9.4.

The default encryption algorithm is SASProprietary. (Previously, the default was AES). Customers who want to use an alternative algorithm can make a different selection in the SAS Deployment Wizard. For countries with encryption restrictions, note that the SAS Deployment Wizard shows the SAS/SECURE products in bold, which indicates that these products are in the plan file but not in the software order.

SAS® VISUAL ANALYTICS

Starting in late 2013, SAS solutions shipping on SAS 9.4 now include SAS® Visual Analytics Administration and Reporting. The only difference between the separately licensed SAS® Visual Analytics and SAS Visual Analytics Administration and Reporting, is that SAS Visual Analytics includes the SAS Visual Analytics Explorer component.

Be aware that SAS Visual Analytics is supported only on Linux and Microsoft® Windows® 64-bit hosts. Therefore, if you upgrade and add SAS Visual Analytics to an environment that is not on these hosts, you must deploy SAS Visual Analytics on a separate Windows or Linux machine.

SAS Visual Analytics offers two types of deployment of the SAS® LASR™ Analytic Servers: distributed and non-distributed. A distributed deployment includes a cluster of high-performance computing nodes that can be co-located with a data provider, such as the SAS® High-Performance Deployment of Hadoop. A non-distributed deployment is run on a single machine by launching a SAS® Workspace Server that runs as a SAS LASR Analytic Server.

A software order can include a distributed LASR Analytic Server, a non-distributed LASR Analytic Server, or both. When both are licensed, you can choose which to configure first. If the non-distributed LASR Analytic Server is configured first, then in the SAS Deployment Wizard, select "Non-distributed LASR" as the "Data Provider." To later configure the distributed LASR Analytic Server, follow the instructions for "Deploying SAS LASR Analytic Server in a Different Mode" in the *SAS Visual Analytics Installation and Configuration Guide (Distributed SAS LASR)*.

Regardless of the type of SAS Visual Analytics deployment that you plan to use, you might be able to set up SAS Visual Analytics separately from your existing SAS environment or you might be able to create a single environment that shares certain common components, such as the SAS Metadata Server. Discuss your deployment plans with your SAS account representative to ensure that your software order meets those needs.

SAS Enterprise BI and other software bundles that include Enterprise BI may have included Mobile Services (formerly Report Services) to enable Mobile BI. These Mobile Services include some of the same software that is also included with SAS Visual Analytics software. Before adding SAS Visual Analytics to an existing configuration, the Mobile Services need to be unconfigured with SAS Deployment Manager and reconfigured during SAS Visual Analytics deployment so that their full functionality is enabled. The products effected are SAS® Visual Analytics Administrator and SAS® Visual Analytics Services. For more information, see the *SAS Visual Analytics: Administration Guide*.

The SAS Visual Analytics Hub acts as a central access point, both for SAS Visual Analytics applications and for SAS solutions that integrate with it. Depending on which products you license and the user roles defined in metadata, you will see links to launch other SAS applications, such as SAS® Business Rules Manager or SAS® Enterprise Case Management. SAS products, such as SAS® Decision Manager, have links to SAS Visual Analytics applications. If you try to directly access a Visual Analytics application for which you do not have permission, you are redirected to the SAS Visual Analytics Hub.

SAS Visual Analytics offers an option to enable guest access for connections via the SAS Visual Analytics Hub, SAS Visual Analytics Report Viewer, and SAS Mobile Services. Using the guest access,

other users at your site can view SAS Visual Analytics reports and other Visual Analytics content. This feature requires that anonymous web access also be enabled. If you intend to offer guest access, then when performing a migration or upgrade, be sure to select anonymous web access in SAS Deployment Wizard, before selecting the SAS Visual Analytics guest access option. For more information, see the *SAS Visual Analytics: Administration Guide*.

If you are migrating from SAS Visual Analytics 6.1 to 7.1, contact SAS Technical Support before you begin the migration. In SAS Visual Analytics 7.1, the SAS Migration Utility is looking for a Public LASR Server, which did not exist in SAS Visual Analytics 6.1. SAS has addressed the issue in SAS Visual Analytics 7.2. The problem will not occur if you are migrating to the 7.2 release, which will ship in 2015.

When updating solutions that include the SAS® High-Performance Analytics Infrastructure, you must manually update the SAS® High Performance Analytics Environment as well. See “Update the Analytics Environment” in *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide*. Solution configuration changes are also required. The *SAS Visual Analytics: Administration Guide* describes how to edit the SAS LASR Analytic Servers to use the new SAS High Performance Analytics Environment path.

If you upgrade or add SAS software to an existing SAS Visual Analytics deployment, a new SAS Application Server context might be created during configuration. The application server context might not be available in the SAS Visual Analytics web applications until additional steps are performed. In SAS® Management Console, you must add the new context to the properties of the Job Execution Service under SAS Web Infrastructure Platform Services. After this context is added, you must either restart all web servers; or, in the SAS Admin web application, login as the unrestricted user and select to reconfigure the Job Execution Service.

THIRD-PARTY INFORMATION

For third-party software information, see **Third-Party Software for SAS® 9.4** at <http://support.sas.com/resources/thirdpartysupport/v94/index.html>.

WEB APPLICATION AND HTTP SERVERS

As stated earlier, the middle-tier software includes the SAS Web Server for use as an HTTP server and the SAS Web Application Server for running SAS web applications. A third-party web application server (such as JBoss server, Oracle WebLogic server, IBM WebSphere application server) is no longer needed or supported.

JAVA RUNTIME ENVIRONMENTS

For SAS 9.4, a Java 7 Java Runtime Environment (JRE) is provided by SAS and installed by the SAS Deployment Wizard. This JRE is used for all clients by default (for all platforms other than z/OS). Some clients, such as the SAS Deployment Wizard and SAS Management Console, might experience problems (such as not you cannot enter information in some dialog boxes) because of an Oracle bug that causes some X servers to lose focus when run with Java 7. Additional details are available on the **SAS® 9.4 Support for Additional Software Products** site at <http://support.sas.com/resources/thirdpartysupport/v94/othersw.html>.

In the second maintenance release for SAS 9.4, an updated JRE is provided by SAS and installed by the SAS Deployment Wizard. The issue of being unable to enter information in some SAS client dialog boxes is resolved by this version of the JRE, but there still might be times where you must click in the entry field to get focus (even though you see the cursor in this field).

Some SAS applications, such as SAS® Enterprise Miner™ and SAS® Forecast Server, are delivered as Java Web Start clients. Java Web Start clients, which are launched by clicking a link in a web page, require a JRE to be installed on the client machine. When using Java Web Start, JRE 1.7 or later needs to be installed on the client machine. It is important to review the information related to applicable third-party JREs for use with Java Web Start. For more information, see the system requirements for your product. Depending on the installed version of the SAS product and the JRE, a hot fix might be

necessary. Use the [SAS Hot Fix Analysis, Download and Deployment Tool](#) to determine if a hot fix is required.

PYTHON

The installation of SAS Visual Analytics includes SAS® Information Retrieval Studio, which requires Python. Python is a third-party software product that is not provided by SAS. In Windows operating environments, the pywin module is also required. This module might not be included in all downloads of Python. If Python is downloaded from python.org, pywin32 also must be downloaded separately and added to the Python installation. Additional details are available on the **SAS® 9.4 Support for Additional Software Products** site at <http://support.sas.com/resources/thirdpartysupport/v94/othersw.html>.

GENERAL CONFIGURATION

REDUCE DEPOT SIZE

Starting with the September 2014 release of SAS 9.4 (Rev. 940_14w36), you can significantly reduce the size of your SAS Software Depot with a new SAS Deployment Wizard command line option, `-sdwcompressdepot`. Refer to the *SAS Deployment Wizard and SAS Deployment Manager 9.4: User's Guide* for details about this option.

RESPONSE FILES

Starting with the second maintenance release for SAS 9.4, SAS® Deployment Wizard records a response file by default. It is no longer necessary for the user to explicitly specify the `record` and `responsefile` parameters to have the deployment choices logged. A response file is created automatically in the installer ID's home directory and is named `ResponseRecord_YYYY-MM-DD.HH.MM.SS.log`

SUDO SUPPORT ON UNIX

For SAS 9.4 releases prior to the second maintenance release, the SAS Deployment Wizard allows `setuid` to run as `sudo` in specific instances during deployment on UNIX operating environments. On the metadata server machine, if the SAS Installer has `sudo`, a new dialog box will appear, allowing the user to select to run `setuid` as `sudo`. If the SAS Installer does not have `sudo` on a metadata server machine, the SAS Deployment Wizard pauses and presents the classic pop-up prompt to run `setuid` as root as it has in the past. On server machines where the metadata server is not configured, the SAS Installer will continue to receive the pop-up prompt to run `setuid` as root, even when the SAS Installer has `sudo`.

Starting with the second maintenance release for SAS 9.4, the ability to allow `setuid` to run as `sudo` at the beginning of script execution is now implemented on all UNIX tiers that include SAS Foundation. A new prompt, Automatic Script Execution, has been added in the SAS Deployment Wizard. This prompt enables an installer to run the `setuid.sh` script using `sudo` with the password provided. The option is not selected by default, so the installer must check the box on the Automatic Script Execution panel. If the installer account does not have the correct `sudo` privileges or chooses not to select the option, the SAS Deployment Wizard pauses and presents the classic pop-up window to run `setuid` as root.

For more information, see "Pre- for installation Checklist External User Accounts for SAS on Windows and UNIX" in the *SAS® 9.4 Intelligence Platform Installation and Configuration Guide*.

MIDDLE-TIER LOG FILES

The location of log files is somewhat different for the SAS 9.4 middle tier and middle-tier related features. When configuring multiple managed web application servers, `SASServer[n]` can represent `SASServer1`, `SASServer2`, and so on. When configuring only one web application server, `SASServer[n]` always represents `SASServer1`. Entities found on other tiers are listed because the web applications might depend on them to be completely functional.

Web Tier Entity	Log location
Web Server	Lev1/Web/WebServer/logs

Web Application Server	Lev1/Web/WebAppServer/SASServern_1/logs
Web Application	Lev1/Web/Logs/SASServern_1
Environment Manager Server	Lev1/Web/SASEnvironmentManager/server-5.0.0-EE/logs

Server Tier Entity

WIP Database (PostgreSQL)	Lev1/WebInfrastructurePlatformDataServer/Logs
Information Retrieval Studio	Lev1/Applications/SASInformationRetrievalStudioforSAS/logs
DIP Job Runner Server	Lev1/Web/Applications/SASWIPSchedulingServices9.4/dip/DIPJobRunner.log

Entities on Multiple Tiers

Environment Manager Agent	Lev1/Web/SASEnvironmentManager/agent-5.0.0-EE/log
Cache locator	Lev1/Web/gemfire/instances/ins_<port#>/gemfire.log
JMS Server	Lev1/Web/activemq/data/activemq.log

Be aware that a middle-tier feature, such as the SAS Environment Manager, has agents on each tier. These agents are still deployed in and have logs in folders under Lev[*n*]/Web in the configuration directory as shown above.

If an issue is encountered, always first check the log for the web application (such as SAS Web Report Studio, SAS® Visual Analytics Explorer, and so on), then check the Web Infrastructure Platform (WIP) services log, and finally check the server log (such as SASServer1, SASServer2, and so on) itself. The culprit of the issue can often be found in the WIP services log (Lev1/Web/Logs/SASServer1_1/SASWIPServices9.4.log).

PORTS

TCP ports in the ephemeral port range can be in use by the UNIX operating system and cause configuration failures. The number of TCP ports used in SAS 9.4 is significantly higher than in previous releases. The following error during the Start Web Application Server configuration step is a strong indication of port conflicts:

Timeout for Application Server startup has reached before port opened

For more information, see “Pre-Installation Checklist for Ports for SAS” in *SAS® 9.4 Intelligence Platform Installation and Configuration Guide*.

SAS ENVIRONMENT URL

During deployment you might be prompted by the SAS Deployment Wizard for the URL location of the SAS environment file. The SAS environment file defines a set of SAS deployments at your site for client applications (such as SAS Enterprise Miner and SAS Forecast Server) to use. Post-installation tasks associated with this file are no longer necessary now that the `sas-environment.xml` file is automatically deployed on the SAS Web Server. In SAS 9.2, the SAS Environment URL was not applicable for some products that now require it, and the default value for this file has changed since SAS 9.3. For more information, see “Configuring the SAS Environment File” in *SAS® 9.4 Intelligence Platform: Middle-Tier Administration Guide* as well as information about the SAS environment file in your product-specific documentation.

SAS ENTERPRISE BUSINESS INTELLIGENCE

SAS® Web OLAP Viewer for Java explorations need to be converted to reports before moving to SAS 9.4. Any data exploration objects that you want to migrate to the target system must be converted to SAS® Web Report Studio reports in the source system before creating the migration package. The Migration Utility Analysis Report addresses this situation. Bookmarks and references to the explorations need to be fixed after converting the reports but before creating the SAS Migration Utility package as well. SAS Web OLAP Viewer for Java explorations cannot be converted to reports with promotion to SAS 9.4. Convert

the data explorations to reports prior to creating the promotion package. The previous documentation related to promoting data explorations has been removed from the SAS 9.4 documentation.

SAS® MODEL MANAGER

SAS Model Manager has had an extreme makeover with the 13.1 release. The Java Client application for SAS Model Manager has been replaced with a web-based user interface. The SAS Model Manager client installation is no longer required on a user's desktop, and Java Web Start is no longer used. SAS Model Manager includes common components from SAS Decision Manager, so do not be surprised by SAS Deployment Wizard prompts for SAS Decision Manager components. Changes for this release also include a new web application URL, SASDecisionManager, and a new user interface title, SAS Decision Manager. The URL and user interface title have been changed to provide consistency across all SAS Enterprise Decision Manager product offerings. Therefore, a customer who licenses SAS Model Manager will have the same user interface as a customer who licenses SAS Business Rules Manager or SAS Decision Manager; however, the categories available within the user interface are determined by the products licensed.

SAS Model Manager requires two SAS Deployment Wizard passes to complete the software updates from SAS Model Manager 12.3 to 13.1. The SAS Deployment Wizard goes into Update mode on the first pass and installs the product updates. Although the `UpdateInstructions.html` file indicates that SAS Model Manager was updated, the process is not complete and SAS Model Manager is not usable until the remaining steps, listed in the *SAS Model Manager 13.1 Administrator's Guide*, are performed.

SAS® STUDIO

SAS Studio is a tool that you can use to write and run SAS code through your web browser. There are three editions of SAS Studio: SAS Studio – Single User, SAS Studio Basic, and SAS Studio Mid-Tier (also called the Enterprise Edition). For software orders that include SAS Studio, the edition of SAS Studio is based on the licensed operating system and the software in the customer order.

- SAS Studio – Single User – available on Windows operating systems when Base SAS is licensed
- SAS Studio Basic – available on UNIX and Windows operating systems when Base SAS is licensed
- SAS Studio Mid-Tier – available on supported middle-tier systems when SAS® Integration Technologies is licensed

SAS Studio was first available in March 2014 and runs on the first maintenance release for SAS 9.4. To determine which edition of SAS Studio is included with your software order, see the SAS Software Summary (`ordersummary.html`) located in the `install_doc/<order-number>` directory of your SAS Software Depot.

Note that it is possible for an order to include SAS Studio Mid-Tier with either SAS Studio – Single User or SAS Studio Basic, depending on the full contents of your software order. In these cases, SAS Studio Mid-Tier is installed and configured like any other SAS web application when included in a SAS deployment plan.

When installed, SAS Studio – Single User is available from the **Start** menu. When started, SAS Studio – Single User launches a browser running on a free port.

When configured, SAS Studio Basic is available from any supported browser running on the port that was specified in the SAS Deployment Wizard. An operating system account is required for this edition.

When deployed, SAS Studio Mid-Tier is available from any supported browser accessing the URL provided in the `Instructions.html` file. SAS Metadata Server login credentials are required for this edition. SAS Studio Mid-Tier is deployed when included in a SAS deployment plan.

For more information about installing and configuring SAS Studio, see *SAS® Studio Administrator's Guide*. Details on using SAS Studio can be found in the *SAS Studio User's Guide* found on the [SAS Studio Product Documentation](#) web page.

TERMS TO KNOW

Here are a few new terms in 9.4:

Cache Locator – used by applications on server-tier and middle-tier machines to locate other members and to form a data cache. The Cache Locator is based on Pivotal GemFire. For more information, see *SAS 9.4 Intelligence Platform: Middle-Tier Administration Guide* and the Pre-Installation Checklist.

JMS Broker – based on Apache ActiveMQ. SAS middle tier software uses the broker for Java Messaging Services (JMS). For more information, see *SAS 9.4 Intelligence Platform: Middle-Tier Administration Guide*.

SAS Deployment Agent – required for deployments that run remote processes. SAS uses the agent to copy content and to perform configuration management operations that are associated with creating new servers and clustering. It is also used for server administration tasks such as deployment backups. For more information, see “SAS Deployment Agents” in *SAS 9.4 Intelligence Platform Installation and Configuration Guide*.

SAS Environment Manager Server – monitoring and management system for SAS deployments that runs on the middle tier. For more information, see *SAS Environment Manager User’s Guide*.

SAS Environment Manager Agent – a component of SAS Environment Manager that runs on each platform (middle tier and server tier) in a SAS deployment. The agent is responsible for discovering software components on its platform, gathering metrics, and reporting back to the management server. For more information, see *SAS Environment Manager User’s Guide*.

SAS Web Server – an HTTP server based on Pivotal Web Server. For more information, see the *SAS 9.4 Intelligence Platform: Middle-Tier Administration Guide*.

SAS Web Application Server – a lightweight server that provides enterprise-class features for running SAS web applications. The SAS Web Application Server is based on Pivotal Web Application Server. For more information, see *SAS 9.4 Intelligence Platform: Middle-Tier Administration Guide*.

CONCLUSION

With any transition, the best advice is to be prepared for what to expect. The SAS documentation provides valuable, detailed information that will help you move to SAS 9.4. Take the time to read the documentation first. Pay careful attention to pre-installation checklists, operating system and product-specific system requirements, and installation and configuration, administration, and user’s guides.

The information in this paper is intended to supplement existing documentation by calling out key features and providing hints on the various topics to help smooth the transition to SAS 9.4 based on our experiences in SAS Customer Experience Testing.

ACKNOWLEDGMENTS

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For consistency between SAS provided material, some of the information is taken directly from SAS 9.4 documentation.

RECOMMENDED READING

For installation, configuration, and migration information, see these resources at <http://support.sas.com/documentation/onlinedoc/intellplatform/index.html>

- *What’s New in SAS 9.4*
- *SAS 9.4 Intelligence Platform: Installation and Configuration Guide*
- *SAS 9.4 Intelligence Platform: Migration Guide*

- *SAS 9.4 Guide to Software Updates*

For administration documentation, see these resources at

<http://support.sas.com/documentation/onlinedoc/intellplatform/tabs/admin94.html>

- *SAS 9.4 Intelligence Platform: System Administration Guide*
- *SAS 9.4 Intelligence Platform: Security Administration Guide*
- *SAS 9.4 Intelligence Platform: Middle-Tier Administration Guide*
- *SAS 9.4 Intelligence Platform: Web Application Administration Guide*
- *SAS 9.4 SAS Web Applications: Tuning for Performance and Scalability*

For SAS Visual Analytics documentation, see these resources at

<http://support.sas.com/documentation/onlinedoc/va/>

- *SAS Visual Analytics: Administration Guide*
- *SAS Visual Analytics Installation and Configuration Guide (Distributed SAS LASR)*
- *SAS Visual Analytics Installation and Configuration Guide (Non-Distributed SAS LASR)*

Also, see this product-specific documentation:

- *SAS High-Performance Analytics Infrastructure: Installation and Configuration Guide* at <http://support.sas.com/documentation/onlinedoc/hpa/index.html>
- *SAS Deployment Wizard and SAS® Deployment Manager 9.4: User's Guide* at <http://support.sas.com/documentation/installcenter/94/index.html>.
- *SAS Environment Manager: User's Guide* at <http://support.sas.com/documentation/onlinedoc/sev/index.html>
- *SAS Model Manager 13.1 Administrator's Guide* at <http://support.sas.com/documentation/cdl/en/mdlmgrag/67039/PDF/default/mdlmgrag.pdf>
- *SAS Studio: Administrator's Guide and SAS® Studio User's Guide* at <http://support.sas.com/documentation/onlinedoc/sasstudio/index.html>

For information about supported characters in passwords in SAS data servers using PostgreSQL, see:

- *PostgreSQL 9.3 Documentation*. Chapter 4. SQL Syntax. "Constants" section. <http://www.postgresql.org/docs/9.3/static/sql-syntax-lexical.html>

See this SAS Global Forum 2014 paper for steps on adding SAS Visual Analytics to an existing environment:

- "Considerations for Adding SAS® Visual Analytics to an Existing SAS® Business Intelligence Deployment." Christine Vitron and James Holman, SAS Institute Inc. *Proceedings of SAS Global Forum 2014*. Paper SAS146-2014. <http://support.sas.com/resources/papers/proceedings14/SAS146-2014.pdf>

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