SAS® Forecast Server 2.1
Administrator's Guide

Contents

Part I

Overview of SAS Forecast Server

Chapter 1

Overview of the SAS Forecast Server Administrator's Guide

Contents

Welcome to SAS Forecast Server

Why Is SAS Forecast Server Important?

Businesses must understand the markets that they serve. In order to understand their markets, businesses must be able to analyze, model, and forecast the demand for their products and services.

These products and services can be driven by many sales drivers, which might include input time series and calendar events. Business leaders must be able to interpret the results of these analyses and make decisions based on these results.

When the various products and services, categories, and geographies are considered, the number of time series, sales drivers, models, forecasts, and decisions can be tremendous. It is not uncommon that millions of time series must be modeled and forecast, and millions of decisions must be made based on these models and forecasts. Given the scale of the problem, customizing a time series model for each time series might not be feasible. An automated system that selects appropriate models and chooses influential sales drivers is required. The automated system must manage the time series data, time series models, calendar events, and results of the forecasting process in a scalable way. The results of the automated system must allow for "what-if" analysis, stochastic optimization, and goal-seeking support for making decisions.

Often businesses want to generate a large number of forecasts based on time-stamped data stored in their transactional or time series databases. Transactional databases contain data from sources such as Web sites, point-of-sale (POS) systems, call centers, and inventory systems. A skilled analyst can forecast a single time series from such data by applying good judgment based on his or her knowledge and experience, by using various time series analysis techniques, and by utilizing good software based on proven statistical theory. Generating frequent forecasts or large numbers of forecasts, however, requires some degree of automation. Common forecasting problems that businesses face include the following:

- No skilled analyst is available.

- Many forecasts must be generated.

- Frequent forecast updates are required.

- Time-stamped data must be converted to time series data.

- Several sales drivers might, or might not, influence the time series.

- Several calendar events might, or might not, influence the time series.

- The forecasting model is not known for each time series.

What Is SAS Forecast Server?

Introduction to SAS Forecast Server

SAS Forecast Server is a client application that provides market-driven planning through accurate, dynamic demand forecasting and decision making. SAS Forecast Studio is the client component that provides a graphical interface to the high-performance forecasting procedures developed for the SAS High-Performance Forecasting software. This software provides a large-scale, automatic, dynamic forecasting system for time-stamped data. For more information about these procedures and about the models underlying these procedures, see the *SAS High-Performance Forecasting User's Guide*.

By using SAS Forecast Server, you can do the following tasks:

- generate models automatically to fit your time-stamped data

- create your own forecasting models

- view and create additional models to determine the model that best fits your data

- perform hierarchical forecasting and reconciliation

- analyze and diagnose your time series data

- override forecasts

- include and manage calendar events

- export projects as SAS code for processing in a batch environment

Given a time-stamped data set, the software provides the following automatic forecasting process:

1. accumulates the time-stamped data to form a fixed-interval time series

2. diagnoses the time series using time series analysis techniques

3. creates a list of candidate model specifications based on the diagnostics

4. fits each candidate model specification to the time series

5. generates forecasts for each candidate fitted model

6. selects the most appropriate model specification based on either in-sample or holdout-sample evaluation using a model selection criterion

7. refits the selected model specification to the entire range of the time series

8. creates a forecast score from the selected fitted model

9. generates forecasts from the forecast score

10. evaluates the forecast using in-sample analysis, and/or provides for out-of-sample analysis of forecast performance

SAS High-Performance Forecasting Procedures Used by SAS Forecast Server

SAS Forecast Server uses the following SAS High-Performance Forecasting procedures that form the basis for the automatic forecasting capabilities:

HPFARIMASPEC   The HPFARIMASPEC procedure is used to create an Autoregressive Integrated Moving Average (ARIMA) model specification file. The output of the procedure is an XML file that stores the intended ARIMA model specification. This XML specification file can be used to populate the

model repository used by the HPFENGINE procedure. (Likewise, the XML files generated by the other model specification procedures in this section can also be used to populate the model repository used by PROC HPFENGINE.)

HPFDIAGNOSE
The HPFDIAGNOSE procedure is an automatic modeling procedure to find the best model among ARIMA Models, Exponential Smoothing Models, and Unobserved Component Models.

The HPFDIAGNOSE procedure has the following functionality:

- intermittency test
- functional transformation test
- simple differencing and seasonal differencing test
- tentative simple ARMA order identification
- tentative seasonal ARMA order identification
- outlier detection
- significance test of events
- transfer functions identification
- intermittent demand model
- exponential smoothing model
- unobserved component model

HPFENGINE
The HPFENGINE procedure provides large-scale automatic forecasting of transactional or time series data. The HPFENGINE procedure extends the foundation built by PROC HPF, enabling the user to determine the list of models over which automatic selection is performed.

The use of many forecast model families is supported when HPFENGINE is used in conjunction with new experimental procedures that generate generic model specifications. Among these models are

- ARIMA
- Unobserved Component Models (UCM)
- Exponential Smoothing Models (ESM)
- Intermittent Demand Models (IDM)
- External Models (EXM)

Furthermore, users may completely customize the operation by defining their own code to generate forecasts.

For models with inputs, the STOCHASTIC statement is especially helpful for automatically forecasting those inputs that have no future values.

Also supported is the generation of a portable forecast score. The output of the SCORE statement is a file or catalog entry which, when used with the new function HPFSCSUB, can be used to efficiently generate forecasts outside of the HPFENGINE procedure.

The new HPFDIAGNOSE procedure produces output that is compatible with HPFENGINE. As a result, the task of candidate model specification can be entirely automated.

HPFESMSPEC
: The HPFESMSPEC procedure is used to create an Exponential Smoothing Model (ESM) specification file. The output of the procedure is an XML file that stores the intended ESM model specification.

HPFEVENTS
: The HPFEVENTS procedure provides a way to create and manage events associated with time series. The procedure can create events, read events from an events data set, write events to an events data set, and create dummies based on those events, if date information is provided.

A SAS event is used to model any incident that disrupts the normal flow of the process that generated the time series. Examples of commonly used events include natural disasters, retail promotions, strikes, advertising campaigns, policy changes, and data recording errors.

An event has a reference name, a date or dates associated with the event, and a set of qualifiers. The event exists separately from any time series; however, the event may be applied to one or more time series. When the event is applied to a time series, a dummy variable is generated that may be used to analyze the impact of the event on the time series.

HPFEXMSPEC
: The HPFEXMSPEC procedure is used to create an External Model (EXM) specification file. The output of the procedure is an XML file that stores the intended EXM model specification.

HPFIDMSPEC
: The HPFIDMSPEC procedure is used to create an Intermittent Demand Model (IDM) specification file. The output of the procedure is an XML file that stores the intended IDM model specification.

HPFRECONCILE
: The HPFRECONCILE procedure reconciles forecasts of time series data at two different levels of aggregation. The procedure enables the user to specify the direction and the method of reconciliation, equality constraints and bounds on the reconciled values at each point in time.

HPFSELECT
: The HPFSELECT procedure is used to create model selections lists. A model selection list contains references to candidate model specifications stored in the model repository. The output of the procedure is an XML file that stores the intended model selection list.

HPFUCMSPEC
: The HPFUCMSPEC procedure is used to create an Unobserved Component Model (UCM) specification file. The output of the procedure is an XML file that stores the intended UCM model specification.

How Does SAS Forecast Server Help You?

SAS Forecast Server provides a tool for a wide variety of applications in business, government, and academia. Major uses of SAS Forecast Server include the following:

- perform forecasting

- provide input to market response modeling applications

- provide input to time series data mining applications

SAS Forecast Server provides automation and analytical sophistication to the forecasting process. By using SAS Forecast Server, which employs SAS High-Performance Forecasting, you can generate millions of forecasts in the turnaround time that is necessary to run your business. You can also uncover previously undetected trends, and you can predict future seasonal fluctuations. These capabilities create ample opportunities for you to reduce costs and increase revenues. The solution enables you to do the following:

- produce trustworthy forecasts that reflect realities of your business

- focus your attention on the most critical forecasts by providing automatic, reliable forecasts on a large scale

- significantly reduce forecasting error

- improve inventory management

- improve forecasts for items that rarely sell

Accessibility and Compatibility Features

SAS Forecast Server 2.1 includes accessibility and compatibility features that improve the usability of the product for users with disabilities, with exceptions noted below. These features are related to accessibility standards for electronic information technology that were adopted by the U.S. Government under Section 508 of the U.S. Rehabilitation Act of 1973. If you have specific questions about the accessibility of SAS Forecast Server, then send them to accessibility@sas.com or call SAS Technical Support.

All known exceptions to accessibility standards are documented in the following table. SAS is committed to improving the accessibility and usability of our products. SAS currently plans to address these issues in a future release of the software.

Table 1.1 Accessibility Exceptions

Section 508 Accessibility Criteria	Support Status	Explanation
(c) A well-defined on-screen indication of the current focus shall be provided that moves along interactive interface elements as the input focus changes. The focus shall be programmatically exposed so that assistive technology can track the focus and any focus changes.	Supported with minor exceptions.	In the New Project Wizard, the initial focus is not set correctly in the following steps: • In Step 3, the initial focus is set to the **Next** button. • In Step 6, the initial focus is set to the **Finish** button. Because the initial focus is set on a button, the previous text in the step is not read. SAS currently plans to address this and other accessibility issues in the New Project Wizard in a future release.
(d) Sufficient information about a user-interface element (including the identity, operation, and state of the element) shall be available to the assistive technology. When an image represents a program element, the information conveyed by the image must also be available in text.	Supported with exceptions.	The following components could not be read by a JAWS screen reader: • Data in tables might not be read properly. This is a known issue in Java. • In the New Project Wizard and Advanced Reconciliation dialog box, the text for some of the options cannot be read. • In the Filter Properties dialog box and the SAS log, the screen reader cannot read the bitmap images that are used for some buttons. SAS currently plans to address these and additional capability issues with screen readers in a future release.

Table 1.1   *continued*

Section 508 Accessibility Criteria	Support Status	Explanation
(g) Applications shall not override user-selected contrast and color selections and other individual display attributes.	Supported with exceptions.	When your operating system is set to high contrast, the following icons and controls might be difficult to discern from the background: • In the hierarchy, the expand (+) and collapse (-) icons for each branch of the hierarchy appear black on black in high contrast, so it is difficult to tell if a branch is fully expanded or collapsed. • In the New Project Wizard and the Variable Assignments dialog box, the arrow buttons that you use to assign variables to roles appear black on black in high contrast. • In the Model View and Series Analysis View, the minimize, maximize, and close buttons in the plot and table windows appear black on black in high contrast. SAS currently plans to address these and additional color and contrast issues in a future release. Until that time, low vision users who require high contrast might find the use of a screen magnifier with reverse video setting to be a sufficient accomodation.

Table 1.1 *continued*

Section 508 Accessibility Criteria	Support Status	Explanation
(l) When electronic forms are used, the form shall enable users of assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.	Supported with exceptions.	To work with assistive technologies, software generally needs to support a visible focus indicator and work with a screen reader. SAS Forecast Studio has exceptions noted in both criteria (c) and (d) that limit its compliance with assistive technologies.

Using This Documentation

Purpose

This administrator's guide describes the processes for installation, configuration, and system administration for the SAS Forecast Server solution as follows:

- understanding system architecture and requirements

- performing pre-installation, installation, and post-installation tasks

- performing system administration

- running SAS administrative macros

- troubleshooting

Intended Audience

The SAS Forecast Server Administrator's Guide is for administrators who need to install, configure, and optimize a SAS solution that is installed on different operations systems. SAS and other programming expertise is not required.

Required Skill Sets

To install, configure, administer, and use the SAS Intelligence Platform and solutions, the following individuals with the necessary skill sets are required for each administrative activity and use.

- System Administrator

  SAS Forecast Server uses the SAS Intelligence Platform. The system administrator should be familiar with the information provided in the SAS Intelligence Platform documentation set that can be found in SAS OnlineDoc at the following Web address:
  http://support.sas.com/onlinedoc/913/docMainpage.jsp

  The system administrator should have the skills to perform the following types of installation, configuration, and administration tasks:

  - installation and configuration of the SAS Intelligence Platform and solution
    The system administrator should install and configure the required SAS Intelligence Platform software on the required operating system.
    To install the SAS Intelligence Platform on the Microsoft Windows operating system, the administrator should meet the following prerequisites:
    * be an administrator of the machine
    * be familiar with Windows concepts
    * know how to create folders
    * know how to run DOS BAT files
    * be familiar with Windows domain concepts in order to create user accounts and groups
  - administration of the solution metadata
    The system administrator must use the SAS Management Console software to maintain the metadata for servers, users, and other global resources that are required by the solution.
  - administration of the SAS Data Integration Studio metadata
    The system administrator must use the SAS Management Console software to maintain the metadata for servers, users, and other global resources that are required by SAS Data Integration Studio if your solution uses ETL processes.

- Solution Administrator
  The solution administrator should have the skills to perform the following types of administration:

  - administration of the solution metadata (optional)
    The solution administrator, or the system administrator, must maintain the metadata for servers, users, and other global resources that are required by the solution.
  - administration of the solution
    The solution administrator must maintain the solution's data, and perform other solution administration to enable users to analyze data.

- Solution User
  The solution user should understand the data to be analyzed, the requirements for analysis, and the results of the data analyses.

Organization

This Administrator's Guide is organized as follows:

Overview
> introduces you to your SAS solution, explains how the guide is organized and presented, provides you with a road map for implementing your solution, and provides additional resources for you to explore if you need more information about your SAS solution software. It also provides a quick overview of the SAS Intelligence Platformand how your SAS solution integrates into the SAS Intelligence Platform.

System Requirements
> describes the environment, hardware, software, data, and network requirements for implementing your SAS solution.

Installation and Configuration
> provides an overview of the planned and software index installations. It also provides post-installation tasks and a process for verifying a successful installation and configuration of your SAS solution.

Administration
> discusses the necessary system administration tasks, such as administration security that your SAS solution requires.

Appendixes
> contains tables that are referenced from within sections of the documentation.

Typographical Conventions

The following list explains the meaning of the typographical conventions used in this document:

roman
> is the standard type style used for most text.

UPPERCASE
> is used for table names, parameter names, specification names, SAS statements, SAS options, SAS macros, and other SAS language elements when they appear in the text.

UPPERCASE BOLD
> is used in the initial lists of statements and options in "Syntax" sections.

oblique
> is used for user-supplied values in the syntax definitions. In the text, these values are written in *italic*.

bold
> is used for user interface elements such as the names of menus, fields, and buttons.

italic
> is used for terms that are defined in the text, for emphasis, and for references to publications.

```
monospace
```
is used for names of variables and data sets when they appear in the text.

monospace bold
is used for URLs, path names, example code, and operating environment commands for case-sensitive platforms.

Where to Go for More Information

Most Current Documentation

For the most current installation and configuration information, see the following Web site and select SAS Forecast Server as your product:
http://support.sas.com/documentation/onlinedoc/index.html

SAS Notes

It is highly recommended that for additional information and support fixes, you check the SAS Notes that are available on the SAS Technical Support Web site. Search for available SAS Notes for SAS Forecast Server or SAS Forecast Studio at the following Web address:
http://support.sas.com/techsup/search/sasnotes.html

SAS Technical Support Services

As with all SAS products, the SAS Technical Support staff is available to respond to problems and answer technical questions.

Online Help

For information about how to operate your software, select **Help**→ **Topics** from within the application.

For information about the version of the software that you are running, select **Help**→ **About** from within the application.

Other Related SAS Publications

- *SAS High-Performance Forecasting User's Guide* provides reference information for a large-scale automatic forecasting system. The software provides for the automatic selection of time series models that are used in forecasting time-stamped data.

  SAS also publishes the **HPF Software Applications Guide**, which is a companion to the *SAS High-Performance Forecasting User's Guide*. The **HPF Software Applications Guide** provides information about the applications for which SAS High-Performance Forecasting procedures are useful.

- **SAS System for Forecasting Time Series** provides information about how you can use SAS to forecast time series.

- *SAS/ETS User's Guide* provides information about econometric analysis, time series analysis, and time series forecasting procedures. In addition to SAS procedures, SAS/ETS software includes interactive environments for time series forecasting and investment analysis.

  SAS also publishes the following books, which are companions to the *SAS/ETS User's Guide*:

  - **SAS/ETS Software: Applications Guide 1, Version 6, First Edition** discusses features of SAS/ETS software for time series modeling and forecasting, financial reporting, and loan analysis.
  - **SAS/ETS Software: Applications Guide 2, Version 6, First Edition** discusses features of SAS/ETS software for econometric modeling and simulation.

- **SAS Analytics Platform Server Administrator's Guide** provides information about the SAS Analytics Platform Server and its configuration wizard that enables you to manage the configuration settings. You can access the **SAS Analytics Platform Server User's Guide** at the following Web address:
  ```
  http://support.sas.com/documentation/onlinedoc/apcore
  ```

Related SAS Software

For More Features and Functionality

Many features not found in this solution software are available in other SAS solutions or in SAS products that are used with this SAS solution. If you do not find a feature that you need in this software, you might find it in one of the following SAS solutions or products.

SAS High-Performance Forecasting

SAS High-Performance Forecasting software provides a large-scale automatic forecasting system. The software provides for the automatic selection of time series models for use in forecasting time-stamped data. For more information about SAS High-Performance Forecasting, see the *SAS High-Performance Forecasting User's Guide*.

SAS/ETS

SAS/ETS software provides SAS procedures that perform econometric and time series analysis and forecasting, as well as financial analysis and reporting. The software also provides an interactve environment for time series forecast and investment analysis. For more information about SAS/ETS software, refer to the *SAS/ETS User's Guide*.

SAS Enterprise Data Integration Server

SAS Enterprise Data Integration Server is an application that enables you to manage extract, transform, and load (ETL) process flows, which are sequences of steps for the extraction, transformation, and loading of data. SAS Enterprise Data Integration Server enables you to do the following:

- specify metadata for sources, such as tables in an operational system

- specify metadata for targets, such as tables and other data stores in a data warehouse

- create jobs that specify how data is extracted, transformed, and loaded from a source to a target

Chapter 2

SAS Forecast Server Architecture and the SAS Intelligence Platform

Contents
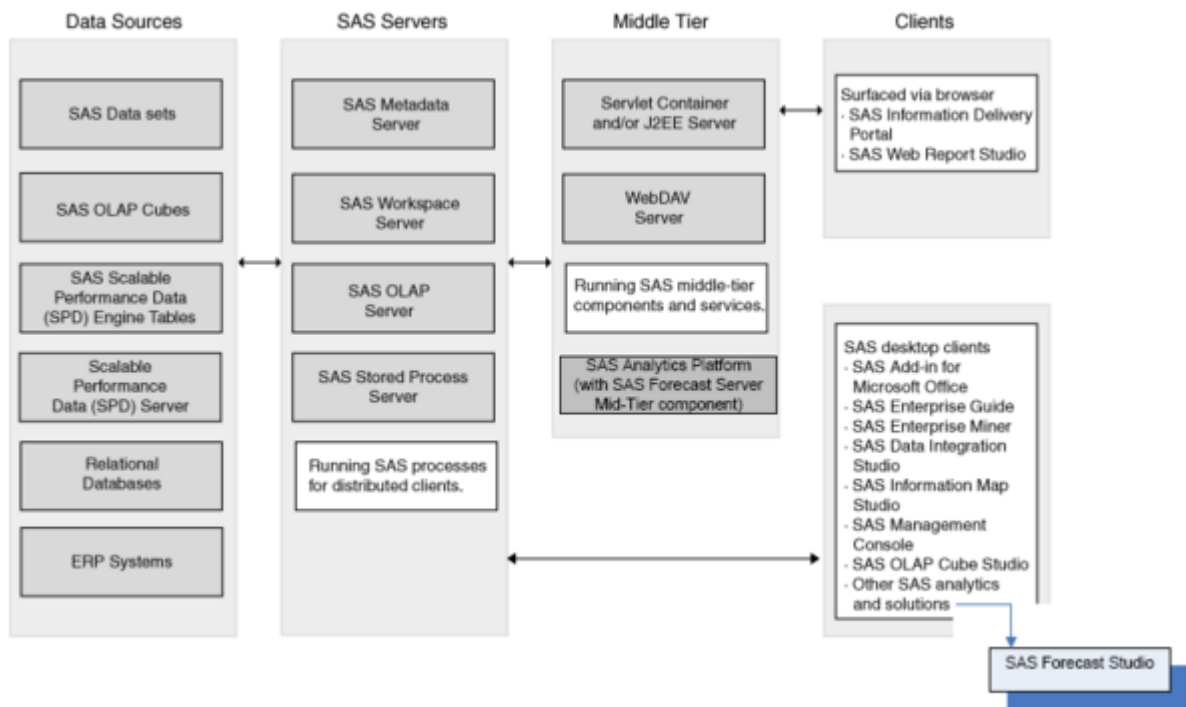
Overview of SAS Forecast Server Architecture

Architecture Diagram

Figure 2.1 shows how the SAS Forecast Studio client and SAS Forecast Server Mid-Tier pieces fit with the SAS Analytics Platform Server, and the SAS Intelligence Platform.

Figure 2.1 SAS Forecast Server Architecture

SAS Intelligence Platform Components

SAS Forecast Server uses the following components of the SAS Intelligence Platform:

SAS Metadata Server

The SAS Metadata Server provides an enterprise-level repository for SAS server configurations and application management metadata. Products such as SAS Forecast Server store metadata concerning users and other resources. Administrators use the SAS Management Console application to administer the SAS Metadata Server, including SAS server configurations. SAS Forecast Server uses the SAS Metadata Server to obtain metadata about SAS libraries and the SAS Workspace Server and SAS Object Spawner, and to authenticate users. SAS Forecast Server accesses the SAS Metadata Server through the SAS Analytics Platform. A SAS System installation is required.

SAS Workspace Server and SAS Object Spawner

The SAS Workspace Server provides all computation and intermediate data storage services. A SAS System installation is required.

SAS Forecast Server uses the SAS Workspace Server to execute the SAS High-Performance Forecasting procedures and to save data to SAS data sets. SAS Forecast Server accesses the SAS Workspace Server and SAS Object Spawner through the SAS Analytics Platform Server.

SAS Analytics Platform

The SAS Analytics Platform is a middle tier application that enables clients to share access to the server tier of the SAS Intelligence Platform. While the SAS Analytics Platform Server

is considered a middle tier application, it does not need to be installed on the Web tier machine. Furthermore, the SAS Analytics Platform Server does not require a local SAS System installation.

The SAS Forecast Studio client calls the SAS Forecast Server Mid-Tier, which uses the SAS Analytics Platform Server to access the SAS Metadata Server and SAS Workspace Server. Shared access enables you to do the following:

- share the same SAS Forecast Server projects
- run long processes in a server application instead of the client application. This enables you to terminate client sessions while the server process runs.

SAS Forecast Server uses the SAS Analytics Platform Server to access servers in order to obtain metadata (SAS Metadata Server), execute the SAS High-Performance Forecasting procedures, and save data to SAS data sets (SAS Workspace Server.)

The SAS Forecast Server Mid-Tier is configured with the SAS Analytics Platform Server. Therefore, the SAS Forecast Server Mid-Tier does not run unless the SAS Analytics Platform Server is started first. For information about configuring the SAS Analytics Platform Server as a Windows service, see "Configure the SAS Analytics Platform Server as a Windows Service" on page 95.

For more information about the SAS Analytics Platform Server, see the *SAS Analytics Platform Server Administrator's Guide* at the following Web address:
http://support.sas.com/documentation/onlinedoc/

SAS Data Integration (optional)
Administrators can use SAS Data Integration to create an input data set and library for the solution. For more information about SAS Data Integration, see the *SAS Data Integration User's Guide* in the SAS Online Doc at the following Web address:
http://support.sas.com/onlinedoc/913/docMainpage.jsp

SAS Forecast Server Components

SAS Forecast Server consists of the following components:

SAS Forecast Server Mid-Tier
The SAS Forecast Server Mid-Tier is installed as an application within the SAS Analytics Platform Server. If you have SAS applications that use the SAS Analytics Platform Server and its Web server, then you must install the SAS Analytics Platform Server on the middle tier. The SAS Forecast Server Mid-Tier must be installed on the same machine as the SAS Analytics Platform Server.

SAS Forecast Studio client
SAS Forecast Server has a thin client component (SAS Forecast Studio) that is the graphical user interface for the user. A SAS System installation is not required for a client configuration. The SAS Forecast Studio client installation includes only the Java files needed for display. All other files are installed on the middle tier server with the SAS Forecast Server Mid-Tier and SAS Analytics Platform Server.

The SAS Forecast Studio client calls the SAS Forecast Server Mid-Tier, which uses the SAS Analytics Platform Server to access the SAS Metadata Server and SAS Workspace Server.

SAS Forecast Server Integration

Figure 2.2 shows the access points for the SAS Forecast Studio client application and the SAS Analytics Platform Server, which includes the SAS Forecast Server Mid-Tier, and SAS High-Performance Forecasting components.

Figure 2.2 SAS Forecast Server and SAS Analytics Platform Server
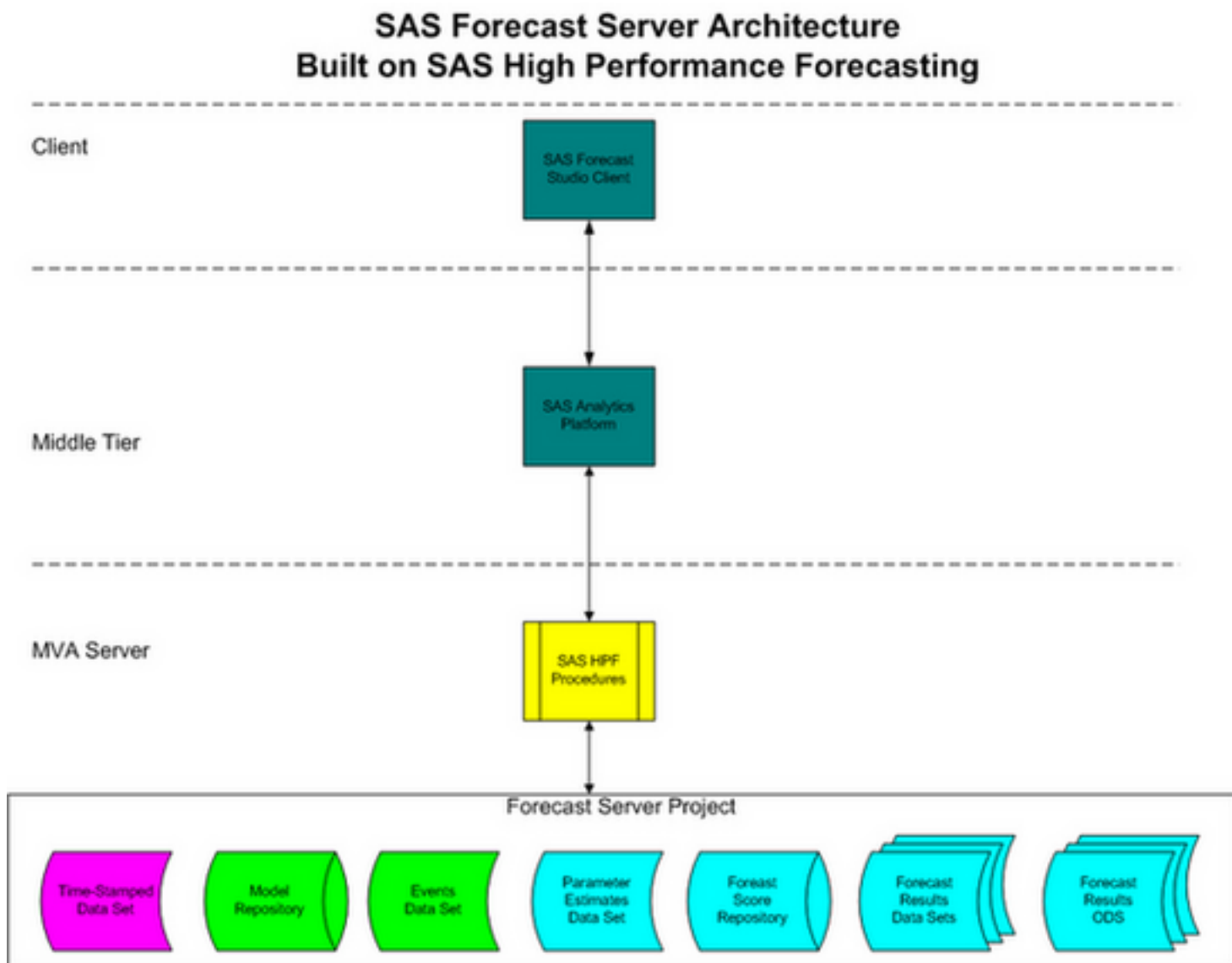
The SAS Forecast Server application uses the following libraries and data sets:

- A SAS library, which is provided by SAS and contains sample SAS data sets, stores information and data about input SAS data sets that you can use for the SAS Forecast Server application.

- A user-defined library, which you create at your site, stores information and data about input SAS data sets for the SAS Forecast Server application.

The following conditions must be true for SAS Forecast Server to run:

- SAS Metadata Server is running. You use the SAS Management Console to administer metadata on the SAS Metadata Server.

- SAS Object Spawner is running.

- SAS Analytics Platform Server is running.

- A SAS input data set is defined in a SAS library or a user-defined SAS library by using SAS Management Console. The input data set contains the appropriate SAS Forecast Server data, and is used within SAS Forecast Server to generate forecasts.

The SAS Forecast Studio client accesses the SAS Forecast Server Mid-Tier when it needs to access the SAS Metadata Server or SAS Workspace Server. The SAS Forecast Server Mid-Tier then accesses the SAS Analytics Platform which uses the SAS Intelligence Platform (SAS Metadata Server and SAS Workspace Server) for the following purposes:

- access and return SAS library metadata from the SAS Metadata Server

- execute SAS High-Performance Forecasting procedures and return results

- authenticate users on the SAS Metadata Server

For more information about the SAS Intelligence Platform, see the SAS Intelligence Platform documentation set in the SAS Online Doc at the following Web address:
http://support.sas.com/onlinedoc/913/docMainpage.jsp

Part II

SAS Forecast Server System Requirements

Chapter 3

System Requirements for SAS Forecast Server

Contents

Hardware Requirements

Hard Disk

- SAS Forecast Studio client installation requires 500 megabytes of hard disk space.

- SAS Forecast Server Mid-Tier and SAS Analytics Platform Server, SAS servers (SAS Metadata Server and SAS Workspace Server), and client installation require 2 gigabytes of hard disk space.

RAM

- SAS Forecast Studio client installation requires a minimum of 128 MB RAM. If your system performance is too slow, then you can increase the amount of RAM. It is suggested that you have more than 1 gigabyte of RAM.

- SAS Forecast Server Mid-Tier and SAS Analytics Platform Server requires a minimum of 128 MB RAM. If your system performance is too slow, then you can increase the amount of RAM. It is suggested that you have more than 1 gigabyte of RAM.

Operating System Requirements

The SAS Forecast Server Mid-Tier is a Java-based, middle-tier component that enables automatic forecasting of time series data. The SAS Forecast Server Mid-Tier is installed as an application within the SAS Analytics Platform Server, and can be installed on the following operating systems:

- Windows XP (32-bit)

- Windows Server 2003 (Standard Edition)

- Windows Server 2003 (Enterprise Edition)

- UNIX AIX (64-bit), Release 5.1 or later

- Solaris (64-bit)

- HP-UX (64-bit)

- HP-Itanium

SAS Forecast Studio is a Java-based, client-tier application that is based on SAS High-Performance Forecasting procedures. The SAS Forecast Studio client can be installed only on the Windows XP operating system.

Software Requirements for SAS Forecast Server

SAS Software Requirements

Required SAS Software

Your software bundle includes the following required SAS products and software:

- SAS/OR (unless SAS/OR is explicitly licensed, use of SAS/OR is limited to licensed users of SAS Forecast Server)

- SAS Forecast Server bundle

  CAUTION: SAS Forecast Server 2.1 must be used with SAS High-Performance Forecasting 2.3 that is available in your software bundle. If you use SAS Forecast Server 2.1 with any earlier versions of SAS High-Performance Forecasting, then you might get unexpected results.

  NOTE: You must install both SAS High-Performance Forecasting and SAS Forecast Server Batch Interface, which are included in your SAS Forecast Server bundle. The new DVD contains macros related to project management and server/client tasks. Using SAS High-Performance Forecasting by itself does not require SAS Forecast Server Batch Interface.

Optional SAS Software

The following SAS products and components are often used with SAS Forecast Server, but are not required to operate SAS Forecast Server:

- SAS Data Integration Studio

- SAS BI Server

- SAS Enterprise Miner

Third-Party-Vendor Software Requirements

In addition to the licensed SAS products required to support SAS Forecast Server, some third-party software is required. For information about the third-party software and to access downloads of the software, see the following Web site:
http://support.sas.com/documentation/configuration/thirdpartysupport/

NOTE: For full functionality, installation of the Java Runtime Environment 1.4.2_09 is required on both the client tier and the middle tier.

Web Browser

Internet Explorer 5.5 (or later) is required.

Data Requirements

Overview of SAS Forecast Server Data Flow

Figure 3.1 shows the general flow of data in SAS Forecast Server.

Figure 3.1 Data Flow in SAS Forecast Server
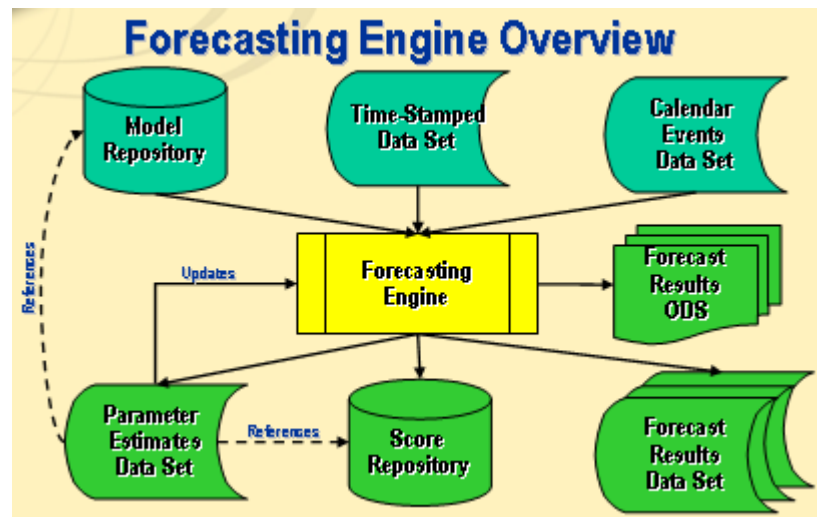
When using SAS Forecast Server, you create or update forecasts by using the following general data flow:

1. Create or generate an input SAS data set, which you store in a pre-assigned SAS library. For information about pre-assigning a SAS library, see the section "Pre-assign Libraries in SAS Management Console" on page 79 in Chapter 9, "Post-installation Tasks."

2. Open SAS Forecast Studio (client), and perform the following steps:

   a) Create a project.
   b) Select your input library and SAS data set.
   c) Assign variables to roles.
   d) Configure the hierarchy (optional).
   e) Set forecasting options.
   f) Finalize the project.

3. Create the forecasting model database.

4. Select the default model selection list.

5. Create events.

6. Generate forecasting results.

7. Modify estimates and forecast data again, if necessary, and repeat steps 3-6 (iterative process).

8. Store forecasting results and parameter estimates.

For a more information about using SAS Forecast Studio, see the SAS Forecast Studio Help System.

Input Data Set Requirements

Overview

In order for SAS Forecast Server to generate a forecast, the input SAS data set must contain one variable for each time series. SAS Forecast Server requires a date or datetime variable in the data set in order to generate forecasts. SAS Forecast Server generates forecasts from timestamped data that consists of unique and equally spaced data over time. If the data are not equally spaced with regard to time, then SAS Forecast Server uses the date or datetime variable to accumulate the data into a time series before forecasting. The input data set must be a single SAS data set that is pre-assigned. For information about pre-assigning libraries, see the section "Pre-assign Libraries in SAS Management Console" on page 79 in Chapter 9, "Post-installation Tasks."

You can use transactional data to generate a forecast. You can use the accumulation options in SAS Forecast Studio to prepare the time series data.

Data Set Variables

You can have the following variables in the input data set:

- The time ID variable must contain the date or datetime value of each observation.

- BY variables enable you to group observations into a hierarchy.

- Dependent variables are the variables used to model and forecast.

- Independent variables are the explanatory or input variables that are used to model and forecast the dependent variable.

- Reporting variables are not used for analysis but for reports only.

- Indicator variables are used to signify any unusual event in the model, such as holidays and promotions.

The names of the variables cannot match any of the reserved variable names that are used in the output data set. The variable names in your input data set cannot start with an underscore and cannot match any of the variable names in the output data sets that SAS Forecast Server creates. The following table lists the variables that are created by the output data sets. For more information about the output data sets that are created, see the *SAS High-Performance Forecasting User's Guide*.

If your input data set contains one of the variables listed in Table 3.1 and you try to assign this variable to a role in SAS Forecast Studio then an error message appears.

Table 3.1 Reserved Variable Names

Variable Name	Description
_VariableName	Any variable name that begins with an underscore
ACTUAL	Dependent series value
COMP	Name of the component
COMPONENT	Model component
CROSS	Cross variable name
DSVAR	Data set variable mapping
EST	Parameter estimate
FACTOR	Model factor
LABEL	Parameter or statistic label
LAG	Lag of input
LOWER	Lower confidence limit
MODE	Mode of decomposition
MODEL	Name of model
MODELVAR	Model variable mapping
NAME	Variable name
PARM	Parameter name
PREDICT	Component forecast
PVALUE	Parameter estimate p-value
SEASON	Seasonal index
SELECT	Name of selection list
SHIFT	Shift
STAT	Statistic name
STATUS	Indicates success/failure in estimating parameter
STD	Prediction standard error
STDERR	Parameter estimate standard error
TIME	Time ID
TIMEID	Time ID values
TVALUE	Parameter estimate t-value
TRANSFORM	Transformation applied
UPPER	Upper confidence limit
AADJRSE	Amemiya's adjusted R-Square
ACF	Autocorrelations
ACF2STD	Indicates ACF beyond two standard errors
ACFLPROB	Autocorrelation log probabilities
ACFNORM	Normalized autocorrelations
ACFPROB	Autocorrelation probabilities
ACFSTD	Autocorrelation standard errors
ACOV	Autocovariances
ADJRSQ	Adjusted R-Square
AIC	Akaike information criterion
APC	Amemiya's prediction criterion
AVG	Average value
CC	Cycle component

Table 3.1 (continued)

Variable Name	Description
CCF	Cross-correlations
CCF2STD	Indicates cross-correlations beyond two standard errors
CCFNORM	Normalized cross-correlations
CCFLPROB	Cross-correlation log probabilities
CCFPROB	Cross-correlation probablities
CCFSTD	Cross-correlation standard errors
CCOV	Cross-covariances
CSS	Corrected sum of squares
ERROR	Prediction errors
IACF	Inverse autocorrelations
IACF2STD	Indicates inverse autocorrelations beyond two standard errors
IACFNORM	Normalized inverse autocorrelations
IACFLPROB	Inverse autocorrelation log probabilities
IACFPROB	Inverse autocorrelation probabilities
IACFSTD	Inverse autocorrelation standard errors
IC	Irregular component
LAG	Time lag
LAGh	Correlation or cross-correlation statistics for lag h
LOWER	Lower confidence limits
MAE	Mean absolute error
MAPE	Mean absolute percent error
MAXERR	Maximum error
MAXIMUM	Maximum value
MAXPE	Maximum percent error
ME	Mean error
MEAN	Mean value
MEDIAN	Median value
MINERR	Minimum error
MINIMUM	Minimum value
MINPE	Minimum percent error
MPE	Mean percent error
MSE	Mean square error
N	Number of non-missing observations or Number of variance products
NAME	Variable name
NMISS	Number of missing observations
NOBS	Number of observations
ORIGINAL	Original series index
PACF	Partial autocorrelations
PACF2STD	Indicates PACF beyond two standard errors
PACFLPROB	Partial autocorrelation log probabilities
PACFNORM	Partial normalized autocorrelations
PACFPROB	Partial autocorrelation probabilities
PACFSTD	Partial autocorrelations standard errors
PCSA	Percent change seasonal adjusted component
PERIODt	Decomposition component value or trend statistic for time period t

Table 3.1   (continued)

Variable Name	Description
PREDICT	Predicted values
RANGE	Maximun value
RMSE	Root mean square error
RSQUARE	R-Square
RWRSQ	Random walk R-Square
SA	Seasonal adjusted component
SBC	Schwarz Bayesian information criterion
SC	Seasonal component
SCSTD	Seasonal component standard errors
SIC	Seasonal-irregular component
SEASONs	Season statistic value for season s
SSE	Sum of squares error
STD	Prediction standard errors
STDDEV	Standard deviation
SUM	Summation value
TC	Trend component
TCC	Trend-cycle component
TCS	Trend-cycle-seasonal component
UMSE	Unbiased mean square error
URMSE	Unbiased root mean square error
UPPER	Upper confidence limits
USS	Uncorrected sum of squares
WN	White noise test statistics
WNLPROB	White noise test log probabilities
WNPROB	White noise test probabilities

Additional Information

Often your data are not in the appropriate format for SAS Forecast Server. To avoid misleading or incorrect analyses from your time series data, you should preprocess your data.

- For general information about working with time series data, see the *SAS/ETS User's Guide*.

- For more information about creating time series data from transactional data, see "The TIME-SERIES Procedure" and "The EXPAND Procedure" documentation in the *SAS/ETS User's Guide*.

- For more information about creating SAS data sets from Excel files, see the IMPORT Procedure documentation in the *Base SAS Procedures Guide*.

- For more information about transposing data for statistical analysis, see "The TRANSPOSE Procedure" documentation in the *Base SAS Procedures Guide*.

National Language Support

SAS Forecast Server is available in the following languages:

- Chinese (Simplified)

- English

- French

- Italian

- Japanese

- Korean

- Russian

Best Practices for System Performance

For information about changing your system settings to improve system performance, see the section about best practices for configuring the middle tier in the *Web Application Administration Guide* of the SAS Intelligence Platform documentation set:
http://support.sas.com/onlinedoc/913/docMainpage.jsp

Part III

Installation and Configuration of SAS Forecast Server

Chapter 4

Overview of Installation and Configuration

Contents

Before Installation

To understand the architecture and components of SAS Forecast Server and how it fits into the SAS Intelligence Platform, see Chapter 2, "SAS Forecast Server Architecture and the SAS Intelligence Platform ."

Before you install SAS Forecast Server, be sure that you have met the system requirements described in Chapter 3, "System Requirements for SAS Forecast Server."

Overview of Installation and Configuration

Installation Methods

When you deploy your business intelligence system, you install your software using a tool called the SAS Software Navigator. The SAS Intelligence Platform documentation set provides you with pre-

installation steps and instructions for installation and configuration for a SAS Software Navigator installation. For more information about the SAS Intelligence Platform, see the documentation set in the SAS OnlineDoc at:

http://support.sas.com/onlinedoc/913/docMainpage.jsp

The SAS Analytics Platform Server documentation provides additional information about installing and configuring the SAS Analytics Platform Server. For information about SAS Analytics Platform Server, see the *SAS Analytics Platform Server User's Guide* at the following Web address:

http://support.sas.com/documentation/onlinedoc/apcore/

You can install your solution, along with the SAS Analytics Platform Server and other SAS products by using one of the following types of installations:

Personal

> uses a sample deployment plan to install and configure SAS software on a single machine. For SAS Forecast Server, you can choose from the following sample plans:
>
> - Forecast Server, one machine
> - Forecast Server and Enterprise Miner, one machine

Advanced

> uses a sample deployment plan or a customized deployment plan made specifically for your site to install and configure SAS software on a single or as part of a multiple machine deployment. For SAS Forecast Server, you can choose from the following sample plans:
>
> - Forecast Server, two machines
> - Forecast Server and Enterprise Miner, two machines

SAS Software Index Installation

> uses an index to select individual SAS products that you want to install and configure. The SAS Software Index installation is recommended only when you want to add a product to an existing SAS deployment. When you perform a Software Index installation, you do not follow a plan; rather, you can choose to install any product from a CD that you licensed from SAS. Although the SAS Configuration Wizard is mainly used with Personal or Advanced installations, you can use the SAS Configuration Wizard to configure your Software Index installation. For more information and instructions about the Software Index installation of SAS Forecast Server, see Chapter 8, "Alternate Installation and Configuration Using the Software Index Installation."

You should select the installation that is appropriate for your environment. If you require a customized deployment plan, then contact your SAS representative.

Overview of Installation and Configuration Steps

Regardless of which installation method (planned or Software Index) that you use, you must perform the installation and configuration steps in the following order:

1. Install the SAS Intelligence Platform.

2. Install the SAS Analytics Platform Server.

3. Install the SAS Forecast Server Mid-Tier.

4. Install the SAS Forecast Studio client.

5. Configure all components for each tier.

Depending on your machine requirements, there are several ways to distribute the servers, services, and solution components across machines.

NOTE: With a Planned installation, which is the recommended approach, all required components are included and installed in the correct order.

Location of Installation Files

Table 4.1 shows the location of the installation files for SAS Forecast Server.

Table 4.1 Location of Installation Files

File	Windows Location	UNIX Location
!SASROOT	C:\Program Files\SAS\SAS 9.1	*<install-dir>*/SAS_9.1
SAS_HOME	C:\Program Files\SAS	*<install-dir>*
SAS Analytics Platform Server	SAS_HOME\SASAPCore	SAS_HOME/SASAPCore
SAS Forecast Server Mid-Tier	SAS_HOME\SASAPCore\apps\Forecasting	SAS_HOME/SASAPCore/apps/Forecasting
SAS Forecast Studio client	SAS_HOME\SASForecastStudio\2.1	Not supported on UNIX
SAS Forecast Server configuration file	SAS_HOME\SASAPCore\apps\Forecasting\app.config	SAS_HOME/SASAPCore/apps/Forecasting/app.config
SAS Forecast Server Startup script	SAS_HOME\SASAPCore\apps\Forecasting\bin\ForecastStudioSetup.bat	SAS_HOME/SASAPCore/apps/Forecasting/bin/ForecastStudioSetup.sh

NOTE: The client is installed in a SAS Forecast Studio 2.1 folder, so it is easy to determine the version number of the client. The middle tier does not have such a directory structure. To identify the version number of the middle tier, navigate to the !SAS_HOME\SASAPCore\apps\Forecasting directory (Windows default) and view the app.config file with a text editor. The following highlighted text shows the version number of the SAS Forecast Server Mid-Tier.

```
application.name=Forecasting
```

```
application.version=2.1
application.build.date=20060511.20.10
application.build.number=1
application.version.major=1
application.version.minor=1
application.remote.class=com.sas.analytics.forecasting.rmi.
RemoteForecastingApplicationRmiImpl
application.local.class=com.sas.analytics.forecasting.rmi.
ForecastingApplicationRmi
application.startup.class=com.sas.analytics.forecasting.
ForecastingApplicationInitializer
application.war=sas.forecasting.war
application.war.link=Y
application.jnlp=main.jnlp
```

Location of SAS Forecast Server Application Files

For SAS Forecast Server, there is a central physical repository of workspace server project files that must be accessible to the SAS Workspace Server. In a multiple-machine environment, the following files are located on the SAS Workspace Server machine. Table 4.3 shows the location of the application files for SAS Forecast Server.

Table 4.3   SAS Forecast Server Project File Locations

Files	Windows Location	UNIX Location
<forecast-studio-project>	c:\SAS\ForecastStudio	*<config-dir>*/SAS/ForecastStudio *<config-dir>* is the home directory of the user who installed SAS Forecast Server.
Archives	*<forecast-studio-project>*\Archives	*<forecast-studio-project>*/Archives
Data Specifications	*<forecast-studio-project>*\DataSpecifications	*<forecast-studio-project>*/DataSpecifications
Projects	*<forecast-studio-project>*\Projects	*<forecast-studio-project>*/Projects
Stored processes	*<forecast-studio-project>*\StoredProcesses	*<forecast-studio-project>*/StoredProcesses
Reports	*<forecast-studio-project>*\Reports	*<forecast-studio-project>*/Reports

SAS Intelligence Platform Installation and Configuration

Before you install the SAS Analytics Platform Server, SAS Forecast Server Mid-Tier, and SAS Forecast Studio client, you must install the SAS Intelligence Platform as one of the following types of installation:

- single machine, stand-alone environment

  For a platform installation, you install and configure the SAS Metadata Server and a SAS Workspace Server. For a single-machine installation, servers and the SAS Analytics Platform Server server are installed on a single machine. All components, including client components, are installed on a single machine. If you want to use a single-machine deployment, then you can use one of the following sample plans that SAS provides:

  - Forecast Server, one machine
  - Forecast Server and Enterprise Miner, one machine

- multiple machine, distributed environment

  For a platform installation, you can install the SAS Metadata Server, SAS Workspace Server, and the SAS Analytics Platform Server on separate machines. The following two-machine planned installations install servers on one machine, and the client on another machine. If you want to use a multiple-machine deployment, then you can use one of the following sample plans that SAS provides:

  - Forecast Server, two machines
  - Forecast Server and Enterprise Miner, two machines

SAS Analytics Platform Installation and Configuration

After the SAS Intelligence Platform is installed, depending on your machine distribution for the SAS Intelligence Platform installation and your machine requirements for the SAS Forecast Server installation, you can install the SAS Analytics Platform Server on one of the following machines:

- For a single-machine platform environment, you install the SAS Analytics Platform Server on the same machine where you installed the SAS Metadata Server and SAS Workspace Server.

- For a multiple-machine platform environment, you can install the SAS Analytics Platform Server on either the SAS Metadata Server machine or the SAS Workspace Server machine.

- For a multiple-machine installation, you can install the SAS Analytics Platform Server on a different machine from either of the machines that you used in the single-machine or multiple-machine installation of the SAS Intelligence Platform.

SAS Forecast Server Installation and Configuration

After the SAS Intelligence Platform and SAS Analytics Platform Server are installed, you can install the components of SAS Forecast Server. The installation location depends on your previous installations of the SAS Intelligence Platform and SAS Analytics Platform Server, and on your machine distribution requirements for SAS Forecast Server:

- SAS Forecast Server Mid-Tier
  You must install the SAS Forecast Server Mid-Tier component on the same machine that you installed and configured the SAS Analytics Platform Server.

- SAS Forecast Studio client
  You can install the SAS Forecast Studio client in one of the following ways:

  - client and middle-tier server on the same machine
    You can install the SAS Forecast Studio client, SAS Forecast Server Mid-Tier component, and SAS Analytics Platform Server on the same machine.

  - separate client and middle tier server machine environment
    You can install the SAS Forecast Studio client on a separate machine from the machine that you installed the SAS Forecast Server Mid-Tier component and SAS Analytics Platform Server (which must be installed on the same machine.)

NOTE: You are not required to install SAS on any machine where you install the SAS Analytics Platform Server, SAS Forecast Server Mid-Tier, or the SAS Forecast Studio client. SAS is only required on the machine that has the SAS Metadata Server and the SAS Workspace Server.

After Installation

After you complete your installation, you should perform the following steps:

1. Perform the required post-installation tasks. For more information, see Chapter 9, "Post-installation Tasks."

2. Perform any additional administration. For more information, see Chapter 12, "Administration Tasks."

3. Verify your installation. For more information, see Chapter 10, "Verify SAS Forecast Server Installation."

4. If you have problems, troubleshoot your installation. For more information, see Chapter 14, "Troubleshooting SAS Forecast Server."

Chapter 5

Upgrading from SAS Forecast Server 1.4 to SAS Forecast Server 2.1

Contents

Overview of the Upgrading Process

These upgrade instructions explain how to protect and migrate your SAS Forecast Studio 1.4 projects and data when you upgrade from SAS Forecast Server 1.4 to SAS Forecast Server 2.1.

Use these upgrading instructions as your primary guide to the upgrading process. These upgrading instructions explain the correct order of all upgrading tasks and point you to instructions in additional documents as necessary. It is recommended that you read this complete chapter before you begin the upgrading process.

For best results, it is recommended that you do not perform installations of SAS Forecast Server 1.4 and SAS Forecast Server 2.1. To preserve your SAS Forecast Server 1.4 installation on the same server. It is recommended that you install SAS Forecast Server 2.1 on a different server.

The server where you install SAS Forecast Server 2.1 is the server where you will run the migration jobs because the migration jobs require the macro catalog that is included in SAS Forecast Server 2.1.

When Should You Perform the Upgrading Process?

Evaluate the forecast plans and choose the time to migrate that best fits your business cycle.

Upgrading Tasks

Upgrading Steps Checklist

Table 5.1 shows the required steps that you must complete for a successful upgrading process of SAS Forecast Server.

Table 5.1   Tasks Checklist

Step	Task
1	Create a copy of your SAS metadata.
2	Create a copy of the stored processes.
3	Create a copy of your current SAS Forecast Server directories.
4	Create a copy of your SAS Analytics Platform Server file.
5	Stop the SAS Analytics Platform Server, SAS Metadata Server, and SAS Object Spawner.

Create a Copy of Your SAS Metadata

For information about how to create a copy of your entire metadata repository, see the section about managing the SAS Metadata Server in the *SAS Intelligence Platform*: Administration Guide that can be found in SAS OnlineDoc at the following Web address:
http://support.sas.com/onlinedoc/913/docMainpage.jsp

Create a Copy of the Stored Processes

For information about how to create a copy of the stored processes, see the section about the BI Manager Import and Export Wizard in the *SAS Intelligence Platform*: Administration Guide that can be found in SAS OnlineDoc at the following Web address:
http://support.sas.com/onlinedoc/913/docMainpage.jsp

Create a Copy of Your SAS Forecast Server Directories

Installation Directories

To create a backup copy of your SAS Forecast Server installation directories, follow the methods that satisfy the security requirements at your site. The installation directories are found in the following default location:

UNIX:
<install-dir>/SASAPCore/apps/Forecasting

Windows:
!SASROOT\SASAPCore\apps\Forecasting

Forecast-studio-project Directories

The *<forecast-studio-project>* directories are the central physical repository of workspace server project files that must be accessible to the SAS Workspace Server. To create a backup copy of your *<forecast-studio-project>* directories, follow the methods that satisfy the security requirements at your site. The *<forecast-studio-project>* directories are found in the following default location:

UNIX:
<config-dir>/SAS/ForecastStudio

<config-dir> is the home directory of the user who installed SAS Forecast Server.

Windows:
c:\SAS\ForecastStudio

Create a Copy of Your SAS Analytics Platform Server File

It is recommended that you create a copy of your apserver.sh (or apserver.bat) file. If you made modifications such as adding nohup and logging, then you will lose those changes when the file is replaced.

To create a backup copy of your SAS Analytics Platform Server script (apserver.bat or apserver.sh), follow the methods that satisfy the security requirements at your site. The apserver file is found in the following default location:

UNIX:
`SAS_HOME/SASAPCore/bin`

Windows:
`SAS_HOME\SASAPCore\bin`

Stop the SAS Analytics Platform Server, SAS Metadata Server, and SAS Object Spawner

SAS Analytics Platform Server

To stop the SAS Analytics Platform Server, perform the following steps:

UNIX:

1. Open a terminal session and have an X server running.

2. Navigate to the !SASROOT/SASAPCore/bin path.

3. Execute the following command:

   `./apserver stop`

Windows:
From the **Start** menu, select
Programs →**SAS**→**SAS Analytics Platform Server**→**Stop AP Server**

Alternatively, you can stop the SAS Analytics Platform Server by executing a .bat file. At a DOS prompt, navigate to the
!SASROOT\SASAPCore\bin directory and use the following command:

`apserver.bat stop`

SAS Metadata Server

To stop the SAS Metadata Server, perform the following steps:

UNIX:

1. Navigate to the following path:
   <path-to-config-dir>/Lev1/SASMain/MetadataServer

2. Execute the script in the directory that stops the SAS Metadata Server.

Windows:
From the **Start** menu, select
Programs →**SAS**→ *<configuration-directory>*→**Stop SAS Metadata Server**

Alternatively, you can stop the SAS Metadata Server by executing a .bat file. You find the .bat file
in the following folder:
<path-to-config-dir>\Lev1\SASMain\MetadataServer

SAS Object Spawner

To stop the SAS Object Spawner, perform the following steps:

UNIX:

1. Navigate to the following path:
   <path-to-config-dir>/Lev1/SASMain/ObjectSpawner

2. Execute the script in the directory that stops the SAS Object Spawner.

Windows:
From the **Start** menu, select
Programs →**SAS**→ *<configuration-directory>*→**Stop SAS Object Spawner**

Alternatively, you can stop the SAS Object Spawner by executing a .bat file. You find the .bat file
in the following folder:
<path-to-config-dir>\Lev1\SASMain\ObjectSpawner

Installing SAS Forecast Server 2.1 on UNIX

UNIX Tasks Checklist

Table 5.2 shows the required steps that you must complete for installing SAS Forecast Server.

Table 5.2 UNIX Tasks Checklist

Step	Task
1	Complete the upgrading tasks.
2	Remove SAS High-Performance Forecasting hot fix.
3	Install SAS Forecast Server.
4	Start the SAS Metadata Server and SAS Object Spawner.
5	Import the SAS Forecast Server stored processes.
6	Start the SAS Analytics Platform Server.

Complete the Upgrading Tasks

Before you begin the installation of SAS Forecast Server 2.1, it is recommended that you complete the preceding upgrading tasks. For information about these tasks, see "Upgrading Tasks" on page 44.

Remove SAS High-Performance Forecasting Hot Fix

If the SAS High-Performance Forecasting hot fixes are applied, then you must remove these hot fixes prior to installing SAS High-Performance Forecasting 2.3, which comes in your SAS Forecast Server bundle. Otherwise, the old files remain in the hot fix directory and are found first. You must run the hotfixcleanup script to remove the hot fixes before you install SAS High-Performance Forecasting 2.3. For information and step-by-step instructions, see the *Important Information* document that is in your SAS Installation Kit. If this document is not available, then go to **http://ftp.sas.com/techsup/download/hotfix/uinst913.html** to download the required script.

Install SAS Forecast Server on UNIX

To install the new version of SAS Forecast Server software, perform the following steps:

1. If your site has created a SAS Software Install Depot, then start the SAS Software Navigator. Alternatively, start the software installation by using the setup.sh script.

2. Select the **Advanced** deployment option and the path to your SID that contains the upgraded version of SAS Forecast Server software. Click **Next**.

3. Verify the SID information. Be sure that you use the new SID file that comes in email prior to receiving your package. If you use your existing SID file, even if it is not expired, then the batch interface components do not get installed and SAS Forecast Server does not work properly. Click **Next**.

4. Select a standard deployment plan or browse to the location of your customized plan. For information about installation methods and plans, see "Installation Methods" on page 37 Click **Next**.

5. Continue the installation instructions by following the tasks specified for the operating environment in which you are installing SAS Forecast Server software.

6. In the Select Your Installation Options window, **deselect** the SAS Configuration Wizard component.

7. Select the installation path and click **Next**. If you specify an alternate default location, then browse to the location before you click **Next**.

8. Select the set of Help files to install, and click **Next**.

9. Review the options before starting the installation process, and click **Install**.

10. Click **OK** in the SAS User Account window.

11. Press ENTER in the SAS Installation Setup window.

12. Type **2** to select the option that updates an existing installation, and press ENTER.

13. Specify the target directory. If the path is correct, then press ENTER. If the path is not correct, then specify the correct installation path and press ENTER.

14. Press ENTER if the path displayed is correct.

15. Press ENTER to load all new licensed software.

16. Select your preferred language, and press ENTER.

17. When asked **Do you wish to continue? (Y)**, press ENTER to complete the installation.

18. Verify the log to check for errors. Warnings can be ignored. Press ENTER to return to SAS Software Navigator.

19. Click **Yes** to continue with the installation. The rest of the installation is in silent mode.

20. Click **Next** in the Welcome to the InstallShield Wizard for SAS Forecast Server Mid-Tier 2.1 window.

21. Click **Next** in the window that specifies the installation directory.

22. Click **Yes to All** when asked if you want to replace the files.

23. Click **Finish** to continue.

Start the SAS Metadata Server and SAS Object Spawner

For information about starting the SAS Metadata Server, see "SAS Metadata Server " on page 100. For information about starting the SAS Object Spawner, see "SAS Object Spawner" on page 104.

Import SAS Forecast Server Stored Processes

Import the stored processes for SAS Forecast Server 2.1 by using the StoredProcesses.spk file. For information about importing the stored processes, see "Import the Default Set of SAS Forecast Server Stored Processes" on page 87.

Start the SAS Analytics Platform Server

For information about starting the SAS Analytics Platform Server, see "SAS Analytics Platform Server " on page 103. For information about configuring the SAS Analytics Platform Server, see the *SAS Analytics Platform Server User's Guide* at the following Web address:
http://support.sas.com/documentation/onlinedoc/apcore

Installing SAS Forecast Server 2.1 on Windows

Windows Tasks Checklist

Table 5.3 shows the required steps that you must complete for installing SAS Forecast Server.

Table 5.3 Windows Tasks Checklist

Step	Task
1	Complete the upgrading tasks.

2	Install SAS Forecast Server.
3	Start the SAS Metadata Server and SAS Object Spawner.
4	Import the SAS Forecast Server stored processes.
5	Start the SAS Analytics Platform Server.
6	Start the SAS Forecast Studio client.

Complete the Upgrading Tasks

Before you begin the installation of SAS Forecast Server 2.1, it is recommended that you complete the preceding upgrading tasks. For information about these tasks, see "Upgrading Tasks" on page 44.

Install SAS Forecast Server on Windows

To install the new version of SAS Forecast Server software on Windows, perform the following steps:

1. If your site has created a SAS Software Install Depot, then start the SAS Software Navigator. Alternatively, start the software installation by using the setup.exe script.

2. Select the **Advanced** deployment option and the path to your SID that contains the upgraded version of SAS Forecast Server software. Click **Next**.

3. Verify the SID information. Be sure that you use the new SID file that comes in email prior to receiving your package. If you use your existing SID file, even if it is not expired, then the batch interface components do not get installed and SAS Forecast Server does not work properly. Click **Next**.

4. Select a standard deployment plan or browse to the location of your customized plan. For information about installation methods and plans, see "Installation Methods" on page 37 Click **Next**.

5. Continue the installation instructions by following the tasks specified for the operating environment in which you are installing SAS Forecast Server software.

6. In the Select Your Installation Options window, **deselect** the SAS Configuration Wizard component.

7. Select the installation path and click **Next**.

8. Select the set of Help files to install and click **Next**.

9. Click **Install**.

10. The System Requirement Wizard runs to verify your operating system components. You might have to restart the machine and start the installation again by using the setup.exe script, which starts SAS Foundation installation. For more information, see the SAS Intelligence Platform documentation set that can be found at the following Web address: **http://support.sas.com/onlinedoc/913/docMainpage.jsp**

11. In the Existing SAS Installation Found window, select **Add components to SAS** and click **Next**.

12. Select the languages for your software to support and click **Next**.

13. Select required components for SAS installation that include the components shown in Figure 5.1.

Figure 5.1 SAS Components for SAS Forecast Server
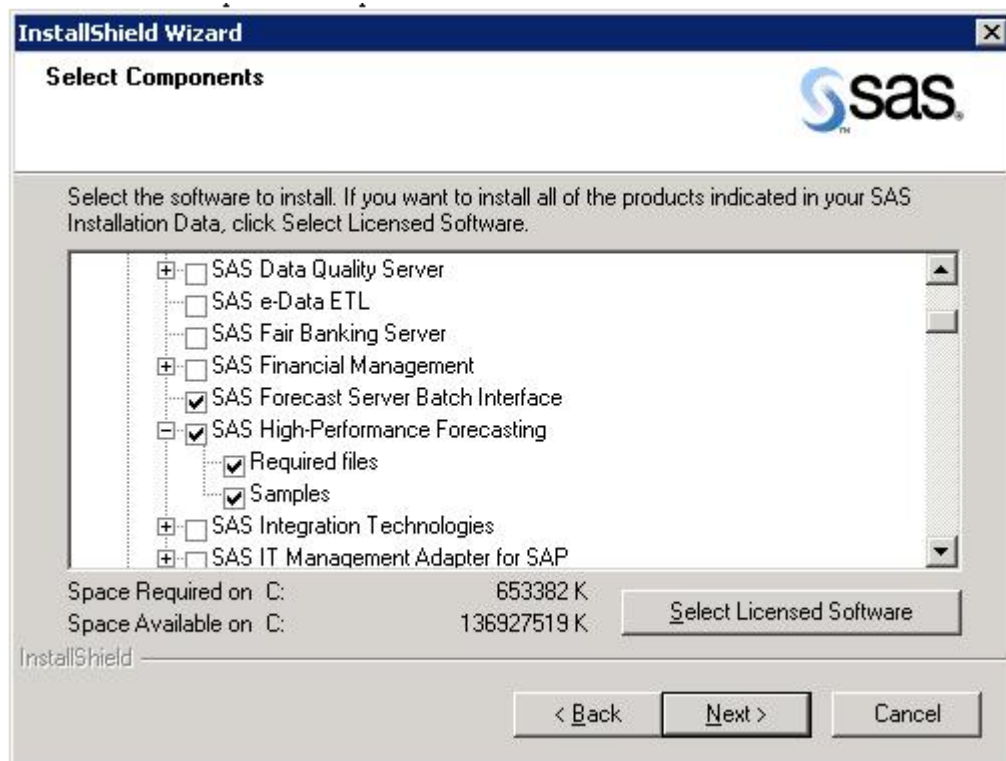
14. On the Confirm Update dialog box, check **Use this response for all file types** and click **Yes**.

15. In the SAS Setup Complete window, click **Finish** after the installation is complete.

16. Complete the SAS Foundation installation. The rest of the components and products are installed automatically in silent mode.

17. Finish the SAS installation.

Start the SAS Metadata Server and SAS Object Spawner

For information about starting the SAS Metadata Server, see "SAS Metadata Server " on page 100. For information about starting the SAS Object Spawner, see "SAS Object Spawner" on page 104.

Import the SAS Forecast Server Stored Processes

You can import the stored processes for SAS Forecast Server by using the StoredProcesses.spk file. For information about importing the stored processes, see "Import the Default Set of SAS Forecast Server Stored Processes" on page 87.

Start the SAS Analytics Platform Server

For information about starting the SAS Analytics Platform Server, see "Start the SAS Analytics Platform Server " on page 108. For information about configuring the SAS Analytics Platform Server, see the *SAS Analytics Platform Server User's Guide* at the following Web address: **http://support.sas.com/documentation/onlinedoc/apcore**

Start the SAS Forecast Studio Client

For information about starting the SAS Forecast Studio client, see Chapter 11, "Start the SAS Forecast Studio Client."

Chapter 6

Pre-installation Tasks

Contents

Pre-installation Checklist

Table 6.1 Pre-installation Tasks Checklist

Task: All Operating Environments
Create all user accounts in the operating environment.
Create a SAS Forecast Server administrative user.
Create a SAS Forecast Server User Group.

Administration Tasks for All Operating Environments

Create User Accounts in the Operating Environment

A pre-installation checklist is referenced in the index.html file that comes with your planning package. You should either print the Pre-installation Checklist and fill in the blanks, or edit the checklist with an HTML editor to fill in the blanks. The remaining installation steps call for this information, and your installation is easier if you complete the checklist before starting your installation process.

NOTE: In order to grant specific permissions, be sure that you create the following SAS user IDs on the server tier machine:

- sasadm

- sasdemo

- sasguest

- sassrv

- sastrust

- fsadm (SAS Forecast Server administrative user)
  NOTE: The SAS Forecast Server administrative user is specific to SAS Forecast Server, and you are not prompted for this administrative user during configuration. You must add this administrative user because it is needed to perform some post-installation tasks.)

Create a SAS Forecast Server Administrative User

In order to perform some installation and configuration tasks, you need to create a SAS Forecast Server administrative user on the SAS Workspace Server machine. Alternatively, you can grant administrative permissions later to an existing user in SAS Metadata Server. Do NOT use the SAS Administrative user (e.g., sasadm).

When creating the user ID for Windows, it is recommended that you do the following:

- Clear the **User must change password at next logon** check box.

- Select the **User cannot change password** check box.

- Select the **Password never expires** check box.

- Grant the user permission **Log on as a Batch Job**.

NOTE: In the Windows user manager, you cannot enter `<domain>\username` (you enter the user name only), but you must enter `<domain>\username` in the SAS Configuration Wizard and SAS Management Console.

You can create a SAS Forecast Server administrative user that must be authenticated on the SAS Metadata Server and the SAS Workspace Server, as shown in Table 6.2. This account is used by the SAS Forecast Server Mid-Tier to access the servers, data, and user credentials.

Table 6.2 SAS Forecast Server Administrative User Information

SAS Forecast Server Administrative User Information		Done
User Name:	Example: For Windows, **\<domain\>\fsadm**, where \<domain\> is the Windows domain qualifier For UNIX, **fsadm**	[ ]
Full Name:	Example: SAS Forecast Server Administrative User	[ ]
Password:		[ ]

Create a SAS Forecast Server User Group

Different users have different operating system privileges when using the SAS Workspace Server. By defining operating system user groups, you can grant permissions to all of the SAS Forecast Server users who log on to the SAS Metadata Server as members of the group with the same credentials.

Later in the post-installation instructions, you must grant SAS Forecast Server users Read, Write, and Execute access on the . . . /SAS/ForecastStudio/ directory that is created during installation. The exact details of how to do this varies according to which operating system groups are defined, and how restrictive you want your security to be.

For a more secure deployment, you can create a SAS Forecast Server user group and ensure that the group contains all of the SAS Forecast Server users. In the UNIX operating environment, the physical central repository of saved projects must have Write permissions by all SAS Forecast Server users. Therefore, the SAS Forecast Server users' UNIX logons must be in the same UNIX OS group. UNIX users can be members of multiple groups, but one of the groups is primary. In this case, the SAS Forecast Server group must be the primary group. In the UNIX operating environment, the following conditions must be met:

- The UNIX OS group of forecasting users is created.

- The UNIX forecasting user IDs are members of the OS group and it becomes the primary group.

- The SAS scripts are updated to specify the umask options when the SAS Workspace Server and SAS Stored Process Server are running under the forecasting group user identities.

- The central physical project repository (*forecast-studio-project-directory*) has the correct ownership and group Write permissions applied on behalf of the forecasting group.

You must include any user who might run code that is created from a SAS Forecast Server project in a SAS session as part of the group.

Chapter 7

Installation and Configuration Using a Planned Deployment

Contents

Preparation Steps

NOTE: If you are upgrading from SAS Forecast Server 1.4 to SAS Forecast Server 2.1, then DO NOT use the following instructions. To upgrade from SAS Forecast Server 1.4 to 2.1, see Chapter 5, "Upgrading from SAS Forecast Server 1.4 to SAS Forecast Server 2.1."

To prepare for a Personal or an Advanced Plan installation for the SAS Forecast Server Mid-Tier and the SAS Forecast Studio client, perform the following steps:

1. Review the SAS Intelligence Platform documentation set. The SAS Intelligence Platform documentation set introduces you to the SAS architecture and concepts, and provides you with an overview and instructions for the SAS deployment process. You can access the SAS Intelligence Platform documentation set in SAS OnlineDoc at the following Web address: **http://support.sas.com/onlinedoc/913/docMainpage.jsp**

2. Determine your deployment architecture. You can install SAS Forecast Server as a single-machine deployment or as a multiple-machine deployment. A Personal deployment uses a sample deployment plan to install and configure SAS software on a single machine. SAS provides you with the following sample plans for a single-machine deployment:

   - Forecast Server, one machine

   - Forecast Server and Enterprise Miner, one machine

   An Advanced deployment uses a sample deployment plan or a customized deployment plan made specifically for your site to install and configure SAS software on a single machine or as part of a multiple-machine deployment. SAS provides you with the following sample plans for a multiple-machine deployment:

   - Forecast Server, two machines

- Forecast Server and Enterprise Miner, two machines

Alternatively, you can customize your deployment plan by contacting your SAS representative. When you and your SAS representative initially plan the deployment of SAS Forecast Server, your SAS representative uses a SAS planning tool (Web application) to record your decisions about what software you need and on what hardware that software is to be installed. Subsequently, SAS sends you an e-mail message with either a set of files or a ZIP file that contains a set of files. The ZIP file contains the following files:

Planning file (plan.xml)
> a key file in the SAS project directory that is used throughout the rest of the deployment process to customize your installation and configuration experience. The plan.xml file serves as input to both the SAS Software Navigator and the SAS Configuration Wizard. Copy this set of files to your project directory.

index.html
> a file that provides high level guidance to the remainder of the deployment process. The index.html file includes a reference to a pre-installation checklist for items that you need to know during the remainder of the process. Information that you enter in the checklist is requested in later stages of the installation process. It is important that you record the information for later use as an aid in consistency and as documentation of decisions that you made.

3. Ensure that you have a valid SAS installation data (SID) file. You receive one or more Software Order Emails (SOE), which contain a SID file. This file contains information about the SAS products that you have licensed. The e-mails instruct you to store these files in a particular location. Place a copy of each SID file in the project directory. During your software installation, when you are prompted for a project directory in the SAS Software Navigator, enter the location of the project directory where you stored your SID file.If you need to request a SID file or have your SID file sent to you again, then contact your SAS representative.

4. Complete the pre-installation checklist as specified in Chapter 6, "Pre-installation Tasks."

Installation and Configuration Steps

To start a personal or advanced planned installation for the SAS Forecast Studio client and SAS Forecast Server Mid-Tier, perform the following steps:

1. For each machine where you need to install software, log on to your computer and start the SAS Software Navigator from your SAS Software Depot, or from the CD that contains the navigator. The SAS Software Navigator is the entry point for you to start the installation and configuration part of the deployment process.

2. After the SAS Software Navigator starts, navigate the screens and enter the following information at the prompts:

- preferred language

- Advanced or Personal installation (It is highly recommended that you use an Advanced installation deployment.)

- location of the SAS installation data (SID) file

- deployment plan (see "Installation Methods" on page 37)

- options, which include the following:

  – the machine on which you will be installing software

  – products you want to install on that machine

  – whether you want installation programs to run silently, if they can run in that mode.

- installation location

- preferred Help language

3. After you have navigated through the SAS Software Navigator screens, the **Review options before starting the installation process** window appears. Review the list of products that you are about to install, and click **Install**. At this point, the SAS Software Navigator switches from its information gathering mode to an installation mode. In its installation mode, the SAS Software Navigator leads you through the following tasks:

- verification of system requirements on Windows systems

- installation of your software. The navigator installs each product that is shown in the list of products in the order shown. In addition, the installations are chained. That is, you do not need to initiate the installation programs; after installing the first product, the navigator automatically proceeds with the installation of the next product.

  The installation of a particular product can be one of three types: a quiet installation, an interactive installation, or a nonstandard installation. For more information, see the SAS Intelligence Platform documentation set, which can be found at the following Web address:

  http://support.sas.com/onlinedoc/913/docMainpage.jsp.

  NOTE: During the SAS Forecast Studio client installation, you might be prompted for the location of the SAS Analytics Platform Server installation. Enter the machine name and port number for the SAS Analytics Platform Server.

- configuration of your software. The last product in the SAS Software Navigator's list of products is the SAS Configuration Wizard. The SAS Configuration Wizard attempts to configure all the software the you installed. Like an interactive installation program, the SAS Configuration Wizard relies on you to supply certain information:

  – For information about entering SAS Configuration Wizard information for the SAS Intelligence Platform products, see the SAS Intelligence Platform documentation set, which can be found at the following Web address:

    http://support.sas.com/onlinedoc/913/docMainpage.jsp.

  – For information about entering SAS Configuration Wizard information for other solutions, see the solution documentation.

– For the most recent information about the post-installation tasks for SAS Forecast Server, see the post-installation tasks document, which can be found by selecting SAS Forecast Server as your product at the following Web address:
http://support.sas.com/documentation/onlinedoc/index.html

NOTE: Machines on which you install only client-tier software might not require configuration. The SAS Forecast Studio client does not use the SAS Configuration Wizard for client configuration.

Chapter 8

Alternate Installation and Configuration Using the Software Index Installation

Contents

Important Notes

- The following instructions do not include installation and configuration instructions for the SAS Intelligence Platform or the SAS Analytics Platform Server. If you do not install and configure these components, then you cannot use SAS Forecast Server.

- If you are upgrading from SAS Forecast Server 1.4 to SAS Forecast Server 2.1, then DO NOT use the following instructions. To upgrade from SAS Forecast Server 1.4 to 2.1, see Chapter 5, "Upgrading from SAS Forecast Server 1.4 to SAS Forecast Server 2.1."

- It is highly recommended that you use an Advanced or Personal planned deployment for installing and configuring SAS Forecast Server software.

Overview

A SAS Software Index installation uses an index to select individual SAS products that you want to install and configure. The SAS Software Index installation is recommended only when you want to add a product to an existing SAS deployment. If you have not installed the SAS Intelligence Platform and SAS Analytics Platform Server, then you must select these components as well. If you do not install and configure these components, then you cannot use SAS Forecast Server.

When you perform a Software Index installation, you do not follow a plan; rather, you can choose to install any product from a CD-ROM that you license from SAS. In addition, you can use the SAS Configuration Wizard to configure your Software Index installation by selecting the SAS Configuration Wizard in your list of products to install.

Start the Software Index Installation

To start the software index installation for either the SAS Forecast Studio client or the SAS Forecast Server Mid-Tier, perform the following steps:

1. Review the SAS Intelligence Platform documentation set.
   The SAS Intelligence Platform documentation set introduces you to the SAS architecture and concepts, and provides you with an overview of the SAS Intelligence Platform deployment. You can access the SAS Intelligence Platform documentation set at the following Web address:
   http://support.sas.com/onlinedoc/913/docMainpage.jsp

2. Ensure that you have a valid SAS installation data (SID) file.

   If you need to request a SID file or have your SID file sent to you again, then contact your SAS representative.

   NOTE: Save the SID file, which was e-mailed to your site, in the project directory. During your software installation, when you are prompted for a project directory in the SAS Software Navigator, enter the location of the project directory where you stored your SID file —for example,
   c:\SAS9_Install_Projects\FSInstall.

3. Start the SAS Software Navigator from your SAS Software Depot or from the CD that contains the navigator. The SAS Software Navigator is the entry point for you to start the installation and configuration part of the deployment process.

   When the SAS Software Navigator starts, specify the following information at the prompts:

   - language: select the language version of the software that you want to install
   - Software Index Install

- location of the SAS installation data (SID) file and SAS Project
  NOTE: If you saved the SID file in a project directory as recommended, then enter the location of the project directory where you stored your SID file.

After you have navigated the installation screens, the Software Index folder in the left pane displays two subfolders:

- Licensed Software folder
- CD Index folder

4. Expand the CD Index folder. You should see a list of subfolders, each of which represents a CD in your Installation Kit.

5. Open a CD folder to display a list of the products on that CD.

   NOTE: If you do not know which CD contains a particular product, then you might need to expand the folders. Use the names of the folders to guide your search.

6. Select the product that you want to install.

   In the right pane of the SAS Software Navigator, you see an HTML page that contains a description of the product, a link to installation instructions, and a link that starts an installation program.

7. Install the product by clicking the **Install** link for your operating system, and run the installation wizard. You can install the SAS Forecast Server Mid-Tier on a Windows or UNIX (AIX) machine. You can install the SAS Forecast Studio client on a Windows machine only. To see the product installation instructions, click the link for the appropriate installation instructions:

   - SAS Forecast Server Mid-Tier installation instructions
   - SAS Forecast Studio client installation instructions

UNIX Installation Instructions

Before Installation

Before you install SAS Forecast Server software, you must install and configure the SAS Analytics Platform Server. For information about installing and configuring the SAS Analytics Platform Server, see the SAS Analytics Platform Server User's Guide at the following Web address:
http://support.sas.com/documentation/onlinedoc/apcore

Install SAS Forecast Server Mid-Tier on UNIX

Notes

- The SAS Analytics Platform must be installed before you install the SAS Forecast Server Mid-Tier.

- If you are using an X Emulator to display the InstallShield Wizard, then the GUI might not appear or behave as it should. Most notably, there might be no window manager borders. It is recommended that you use a more native X window manager, such as the Motif Window Manager.

- If some of the default filenames and locations that are used in the InstallShield Wizard include embedded blanks, then it is suggested that you remove blanks from the filenames and directory names.

- By default, an error log is created in the `$userhome$/SAS/SASAPCore/logs` directory.

Java Runtime Environment (JRE)

SAS Private JRE

Before installing the software, the appropriate Java Runtime Environment (JRE) must be installed on your computer. The SAS Private JRE is a fully functional Java Runtime Environment provided by the JRE vendor for installation and runtime use of SAS applications requiring the JRE. For information about the required JRE and to access downloads of the JRE, see the following Web site:

http://support.sas.com/documentation/configuration/thirdpartysupport/

SAS Private JRE Default Installation Location

The SAS Private JRE installation defaults to the locations below. It is highly recommended that you install the SAS Private JRE in the default location.

The location for JRE should be the following:
/usr/local/SAS_9.1/sasjre/1.4.2

When a Java Runtime Environment (JRE) is required, each software installation program searches the computer to locate the required JRE. The installation program searches first for the SAS Private JRE, and then searches for a Standard Public JRE if the SAS Private JRE is not detected. If the recommended version of the JRE is not located in one of the paths specified below, then the installation program requests that you enter a path to a valid JRE.

The search is performed recursively in the order specified below:

SAS Private JRE	**/usr/local/SAS_9.1/sasjre/1.4.2**
Standard Public JRE	**/usr/java**

WARNING: SAS highly recommends that you run your SAS software by using the Java Runtime Environment version required for the software. The following procedure allows you to bypass this

requirement, and should only be used in special circumstances and at your own risk. SAS does not provide support for an alternate JRE version that has not been tested fully by SAS.

If the correct Java version cannot be found, then the installation program asks you to specify the path to the JRE, or if you want to install it. If at any time the installation program finds a Java version that matches the SAS recommended version of Java, then the installation program uses that version and does not allow you to go back and change it. You have to exit and start the installation over in order to use a different Java version.

Install the SAS Forecast Server Mid-Tier

The SAS Forecast Server Mid-Tier installs as an application within the SAS Analytics Platform.

1. Run the setup shell script (ForecastStudioSetup.sh).

2. Choose your preferred language and click **OK**.

3. In the Welcome window, click **Next**.

4. In the SAS Analytics Platform Location window, if you installed the SAS Analytics Platform in the default location, then click **Next**. If you installed the SAS Analytics Platform in a different location, then specify the location of the SAS Analytics Platform and click **Next**.

5. In the SAS Forecast Server Mid-Tier Location window, click **Next** to begin the installation. The SAS Forecast Server Mid-Tier must be installed in the same location as the SAS Analytics Platform.

6. After you install the SAS Forecast Server Mid-Tier successfully, click **Finish** to exit the InstallShield Wizard.

Start the SAS Forecast Server Mid-Tier

The SAS Forecast Server Mid-Tier is started automatically when you start the SAS Analytics Platform.

Start the SAS Analytics Platform Server by performing the following steps:

1. Navigate to the path **!SASROOT/SASAPCore/bin**

2. Run the apserver program with the following command:

   apserver start

   NOTE: Depending on how the SAS Analytics Platform is configured, you might be prompted for logon information when the SAS Analytics Platform runs for the first time. You should log on as the SAS Administrator (e.g., sasadm) who has administrative privileges so that the SAS Analytics Platform has full access to the metadata server. It is recommended that you check **Remember this password**.

There is no indication that the SAS Analytics Platform is running. Remember that the SAS Forecast Server Mid-Tier is installed as an application within the SAS Analytics Platform. Therefore, when the SAS Analytics Platform starts, the SAS Forecast Server Mid-Tier starts, too.

For information about configuring the SAS Analytics Platform as a background process, see Chapter 9, "Post-installation Tasks."

SAS Forecast Studio Client on UNIX

The SAS Forecast Studio client is not supported on UNIX. For information about installing the SAS Forecast Studio client on a Windows operating system, see "Install the SAS Forecast Studio Client on Windows" on page 71.

Windows Installation Instructions

Before Installation

Before you install SAS Forecast Server software, you must install and configure the SAS Analytics Platform Server. For information about installing and configuring the SAS Analytics Platform Server, see the *SAS Analytics Platform Server User's Guide* at the following Web address: **http://support.sas.com/documentation/onlinedoc/apcore**

Install the SAS Forecast Server Mid-Tier on Windows

Java Runtime Environment (JRE)

The InstallShield Wizard guides you through the installation process. You must have a Java Runtime Environment (JRE) installed. First the installation program searches for the SAS Private JRE, and then searches for a Standard Public JRE if the SAS Private JRE is not detected. If the recommended version of Java is not located in one of the paths specified below, then the installation program asks you to enter a path to a valid JRE.

The installation program searches for a valid JRE in the following locations and order:

- Windows Registry Key

    – **HKEY_LOCAL_MACHINE\SOFTWARE\SAS Institute Inc.\SAS JRE\1.4.2**

- SAS Private JRE

- **– `<rootdrive>\Program Files\SAS`**
- **– `< rootdrive>\Program Files\SAS Institute`**
- **– `< rootdrive>\Program Files\Java`**
- **– `< rootdrive>\Program Files\JavaSoft`**

- Standard Public JRE

  - **– `< rootdrive>\Program Files\Java`**
  - **– `< rootdrive>\Program Files\JavaSoft`**
  - **– `C:\j2re1.4.2`**
  - **– `C:\j2sdk1.4.2`**
  - **– `C:\jre1.4.2`**
  - **– `C:\jdk1.4.2`**
  - **– `C:\java1.4.2`**
  - **– `C:\java`**

- User Specified JRE

  - **–** `<location-specified-by-user>`

WARNING: It is highly recommended that you run your SAS software by using the Java Runtime version required for the software. The following procedure allows you to bypass this requirement, and should only be used in special circumstances and at your own risk. SAS does not provide support for an alternate JRE version that has not been subjected to full testing by SAS.

If the correct Java version cannot be found, then the installation program asks you if you want to specify the path to the JRE or if you want to install it. If at any time the installation program finds a Java version that matches the SAS recommended version of Java, then the installation program uses that version and does not allow you to go back and change it. You have to exit and start the installation over in order to use a different Java version.

Install SAS Forecast Server Mid-Tier

To install the SAS Forecast Server Mid-Tier, perform the following steps:

1. Run the installation program.

2. Choose your language, and click **OK**.

3. In the Welcome window, click **Next**.

4. In the SAS Analytics Platform Location window, if you installed the SAS Analytics Platform in the default location, then click **Next**. If you installed the SAS Analytics Platform in a different location, then specify the location of the SAS Analytics Platform and click **Next**.

5. In the SAS Forecast Server Mid-Tier Location window, click **Next** to begin the installation. The SAS Forecast Server Mid-Tier must be installed in the same location as the SAS Analytics Platform.

6. After you install the SAS Forecast Server Mid-Tier successfully, click **Finish** to exit the InstallShield Wizard.

Start the SAS Forecast Server Mid-Tier

If the SAS Analytics Platform is installed as a Windows service, then the SAS Forecast Server Mid-Tier starts automatically when the SAS Analytics Platform starts. By default, the SAS Analytics Platform is not installed as a Windows service. It is recommended that you install the SAS Analytics Platform as a Windows service. By doing so, the SAS Analytics Platform restarts when its machine reboots, and runs even when users log off of the machine.

You can install and start the SAS Analytics Platform as a Windows service by performing the following steps:

1. If the SAS Metadata Server is installed on the same machine as the SAS Analytics Platform, then modify the !SASROOT\SASAPcore\conf\wrapper.conf file.

    a) Open your Windows services by selecting
       Start→**Settings**→**Control Panel**→**Administrative Tools**→**Services**. Look for the SAS metadata service (i.e. SAS Lev1 MS - Forecast). You must use the exact name of the service in the next step.

    b) Near the end of the file, you see a property `wrapper.ntservice.dependency.1=` *value*. The *value* must be the exact name of the metadata service from the preceding step.

    By default, the SAS Analytics Platform service is configured to include the SAS Metadata Server as a dependency. If you choose to run the metadata server on another machine, then this dependency must be removed. To remove the dependency, perform the following steps:

    a) Navigate to the !SASROOT\SASAPcore\conf\ directory.

    b) Edit the wrapper.conf file. Comment out the following line that is located near the end of the file by adding a # character at the start of the line as follows:
       # wrapper.ntservice.dependency.1=*value*

2. Navigate to the !SASROOT\SASAPCore\bin path at a DOS prompt, and run the `AnalyticsPlatformService.bat install` command. This script installs the SAS Analytics Platform as an automatic service, but does not start the SAS Analytics Platform initially.

3. Start the service from the Services application, or by using the following command or by rebooting the machine.
   `AnalyticsPlatformService start`

The SAS Analytics Platform is configured to start automatically when your computer boots, so you should not have to start the SAS Analytics Platform manually in the future.

If the SAS Analytics Platform does not run as a service, then the SAS Forecast Server Mid-Tier starts automatically when you start the SAS Anlaytics Platform.

Copyright Information

Install the SAS Forecast Studio Client on Windows

Java Runtime Environment (JRE)

The InstallShield Wizard guides you through the installation process. You must have a Java Runtime Environment (JRE) installed. First the installation program searches for the SAS Private JRE, and then searches for a Standard Public JRE if the SAS Private JRE is not detected. If the recommended version of Java is not located in one of the paths specified below, then the installation program asks you to enter a path to a valid JRE.

The installation program searches for a valid JRE in the following locations and order:

- Windows Registry Key

    – **HKEY_LOCAL_MACHINE\SOFTWARE\SAS Institute Inc.\SAS JRE\1.4.2**

- SAS Private JRE

    – **<rootdrive>\Program Files\SAS**
    – **< rootdrive>\Program Files\SAS Institute**
    – **< rootdrive>\Program Files\Java**
    – **< rootdrive>\Program Files\JavaSoft**

- Standard Public JRE

    – **< rootdrive>\Program Files\Java**
    – **< rootdrive>\Program Files\JavaSoft**
    – **C:\j2re1.4.2**
    – **C:\j2sdk1.4.2**
    – **C:\jre1.4.2**
    – **C:\jdk1.4.2**
    – **C:\java1.4.2**
    – **C:\java**

- User Specified JRE

– `<location specified by user>`

WARNING: It is highly recommended that you run your SAS software by using the Java Runtime Environment version required for the software. The following procedure allows you to bypass this requirement, and should only be used in special circumstances, and at your own risk. SAS does not provide support for an alternate JRE version that has not been subjected to full testing by SAS.

If the correct Java version cannot be found, then the installation program asks you if you want to specify the path to the JRE or if you want to install it. If at any time the installation program finds a Java version that matches the SAS recommended version of Java, then the installation program uses that version and does not allow you to go back and change it. You have to exit and start the installation over in order to use a different Java version.

Install SAS Forecast Studio Client

You must have JRE 1.4.2_09 installed on the client machine. You need to either install the required JRE version or configure Web Start to use the required version.

The JRE 1.4.2_09 is used as the Web Start run-time version, which does not need to be the same version as Web Start itself. You can use J2SE 5.0 for Web Start and launch the SAS Forecast Studio client by using the SAS Private JRE 1.4.2_09. If you use different JRE versions, then Web Start must be configured to include the JRE 1.4.2_09 version. This can be done by using the **Preferences** menu option in the Java Web Start Application Manager.

There is no automatic installation available for JRE 1.4.2_09 from Sun. You must first install a JRE version that contains Web Start. This prevents you from using the SAS Private JRE, because it does not contain Web Start. It is recommended that you install either JRE 1.4.2_09 from Sun or the latest JRE available from Sun at the following Web address:
http://java.sun.com/products/archive/j2se/1.4.2_09/index.html

To install the SAS Forecast Studio client perform the following steps:

1. Start the installation program.

2. Choose your preferred language and click **OK**.

3. In the Welcome window, click **Next**.

4. Install the SAS Forecast Studio client in the default location and click **Next**.

5. In the SAS Forecast Studio Location window, click **Next**.

6. After you install the SAS Forecast Studio client successfully, click **Finish**.

Start the SAS Forecast Studio Client

For information about how to start the SAS Forecast Studio client, see Chapter 11, "Start the SAS Forecast Studio Client."

Chapter 9

Post-installation Tasks

Contents

Post-installation Tasks Checklist

There are tasks that you must perform manually after you successfully install your SAS Forecast Server software and after you complete the SAS Configuration Wizard tasks. Table 9.1 is a tool that you can use to keep track of your progress. You can print this checklist and add check marks in the Done column after you complete each task.

Table 9.1   Post-installation Tasks Checklist

Step	Tier	Task	Done
Before You Begin			
1		Review most current documentation.	[ ]
2	Server tier	Install current hot fixes.	[ ]
UNIX Operating Environments			
1	Server tier	Define a user group and permissions to access metadata.	[ ]

2	Middle tier	Configure the SAS Analytics Platform Server to run as a background process.	[ ]
3		Complete the post-installation tasks for all environments.	[ ]
All Operating Environments			
1	Server tier	Pre-assign libraries in SAS Management Console.	[ ]
2	Server tier	Configure a server for SAS Add-In for Microsoft Office functionality.	[ ]
3	Middle tier	Create the file directory.	[ ]
4	Middle tier	Import the default set of stored processes.	[ ]
5	Middle tier	Configure the stored process service.	[ ]
6	Middle tier	Enable the Search for Servers functionality (optional).	[ ]
Windows Operating Environment			
1		Complete the post-installation tasks for all environments.	[ ]
2	Server tier	Set file system permissions.	[ ]
3	Middle tier	Configure the SAS Analytics Platform Server as a Windows service.	[ ]

Before You Begin

Most Current Documentation

For the most current installation and configuration information, see the following Web site and select SAS Forecast Server as your product:
http://support.sas.com/documentation/onlinedoc/index.html

Server Tier

Install Current Hot Fixes

You must install the current hot fixes for SAS 9.1.3 on the machine that is running the SAS Workspace Server (server tier). You must install the hot fixes on the server tier before you start the SAS Forecast Server post-installation tasks.

The required hot fixes can be downloaded from the following Web address:
http://ftp.sas.com/techsup/download/hotfix/e9_sbcs_home.html

1. Select **Sorted by SAS Product** and then **Base SAS** or **SAS Integration Technologies**.

2. To search for SAS Forecast Server hot fixes, select **Hot Fixes for Additional SAS Products and Solutions** and scroll to **Forecast Server 2.1**. If no hot fixes exist, then you will not see a Forecast Server 2.1 selection. Do NOT install any previous versions of SAS Forecast Server hot fixes. These hot fixes already exist in SAS Forecast Server 2.1 software.

CAUTION: At the minimum, you must install the following system hot fixes in order for the system to function:

- E9BA26 (Base SAS)

- E9BA27 (Base SAS)

- E9BB40 (Base SAS)

- E9BB58 (Base SAS —Windows only)

- E9BB74 (Base SAS)

- E9IH01 (SAS Integration Technologies)

CAUTION: Service Pack 4 for SAS 9.1.3 and the hot fixes for Service Pack 4 are required in order for SAS Forecast Server to function correctly.

In order to receive Problem Alert Notices or Problem Correction Notices (hot fix notifications) when they are made available, you can subscribe to the TSNEWS-L mailing list. To subscribe, send e-mail to LISTSERV@VM.SAS.COM. The body of the e-mail should read SUBSCRIBE TSNEWS-L. To subscribe through the SAS Technical Support Web site, complete the Web form located at: http://support.sas.com/techsup/news/tsnews.html.

UNIX Administration Tasks

Server Tier

Define a User Group and Permissions to Access Metadata

Different users have different operating system privileges when using the SAS Workspace Server. By defining operating system user groups, you can grant host permissions to all of the SAS Forecast Server users as members of the same group. For SAS Forecast Server, there is a central physical repository of workspace server project files (forecast-studio-project-directory) that must be accessible to the SAS Workspace Server.

For a more secure deployment, you can create a SAS Forecast Server user group, and ensure that the group contains all of the SAS Forecast Server users. You must include any user who might run

code that is created from a SAS Forecast Server project in a SAS session as part of the group. Also, the group should be the primary group. For more information about SAS Intelligence Platform security, see the SAS Intelligence Platform documentation set at the following Web site: http://support.sas.com/onlinedoc/913/docMainpage.jsp

If you already created a SAS Forecast Server user group as a pre-installation task, then you can grant the same permissions to everyone in the user group. Later when you create the SAS Forecast Server directories, you must grant Write permission on the SAS Forecast Server directory on all machines where you installed SAS Forecast Server. Be sure to verify that SAS Forecast Server users have Read, Write, and Execute permissions on the SAS Forecast Server file directory. The exact details of how to do this varies according to which operating system groups are defined and how restrictive you want your security to be.

The following method is one suggestion. This method might not be applicable to your situation. Typically, you can create an operating system group for SAS Forecast Server users. The following examples might require changes as per your server configurations. In particular, these examples could result in changed permissions on other SAS files, such as OLAP cubes. For example, if you are working with multiple UNIX groups and have a SAS OLAP Server, you must ensure that the account under which the SAS OLAP Server runs still has read and execute permissions to OLAP files.

You can grant permissions to the SAS Forecast Server users by specifying the umask option on a conditional basis if the user is part of the SAS Forecast Server user group.

1. Set the umask option in the following shell scripts only if the user is a member of the SAS Forecast Server user group:

   - sas.sh
     (located in the **!SASROOT/<your–configuration–directory>/ Lev1/ SASMain** path)
   - sas_SPS.sh
     (located in the **!SASROOT/<your–configuration–directory>/ Lev1/ SASMain/StoredProcessServer** path)

2. A umask setting of 007 is recommended.

On a UNIX operating environment, several lines that are shown in the following script need to be updated based on your machine-specific information.
NOTE: The following code uses grave accents and not quotation marks.

```
CMD=<your-operating-system-path>
CURR_GID=`eval $CMD -g`
GID=<solution-group-id>
if [$CURR_GID -eq $GID]; then umask 007 fi
```

1. `CMD=<your-operating-system-path>`
   Replace the CMD= command with the full path on your server where the ID command is stored. This information can be obtained by typing a `which id` or `whence id` command on your console.

2. `GID=<solution-group-id>`

   Replace the GID= variable setting with your group ID. You can type `id` on your console in order to get the GID and UID information.

By using the preceding example values, the resulting command lines look like the following for each of the platforms on which you can install SAS Forecast Server:

- AIX:
  ```
  CMD=/usr/bin/id
  CURR_GID=`eval $CMD -g`
  GID=201
  if [$CURR_GID -eq $GID]; then umask 007
  fi
  ```

- H64 (HP-Risc):

  ```
  CMD=/usr/bin/id
  CURR_GID=`eval $CMD -g`
  GID=201
  if [ $CURR_GID -eq $GID ] ; then umask 007
  fi
  ```

- H64I (HP-Itanium):
  ```
  CMD=/usr/bin/id
  CURR_GID=`eval $CMD -g`
  GID=201
  if [ $CURR_GID -eq $GID ] ; then umask 007
  fi
  ```

- S64 (Solaris):
  ```
  CMD=/usr/xpg4/bin/id
  CURR_GID=`eval $CMD -g`
  GID=201
  if [ $CURR_GID -eq $GID ] ; then umask 007
  fi
  ```

- LNX(Linux):
  ```
  #!/bin/bash
  CMD=/usr/bin/id
  CURR_GID=`eval $CMD -g`
  GID=500
  if [ "$CURR_GID" -eq "$GID" ] ; then umask 007
  fi
  ```

Middle Tier

Configure the SAS Analytics Platform Server to Run as a Background Process

By default, the SAS Analytics Platform Server server terminates when the X Window session that starts the server is closed. In order for the SAS Analytics Platform Server server to continue to run after the X Window session is closed, perform the following steps:

1. If the SAS Object Spawner is not running, then start the SAS Object Spawner, which starts the SAS Metadata Server and SAS Workspace Server.

2. If other SAS products that you licensed include a Web tier with Remote Services, then start the Remote Services.

3. Run the SAS Analytics Platform Server Configuration Wizard by submitting the command `./apserver config`. Use the sasadm user account and be sure to check the box **Remember password** in order to store your credentials. If you do not store your credentials, then you cannot run the SAS Analytics Platform Server as a background process.

   NOTE: The apserver script typically is found in the following location: !SASROOT/SASAPCore/bin

4. Accept all the default values and settings. For more information about the SAS Analytics Platform Server, see *SAS Analytics Platform Server User's Guide* at the following Web address:
   http://support.sas.com/documentation/onlinedoc/apcore

5. Edit the apserver script by adding the `nohup` command to the beginning of the Java command. Add an ampersand (**&**) at the end of the Java command as shown in the following example:

   NOTE: The values shown in these examples may differ slightly from the values in the script at your site.
   Original command:

   ```
   # was $JAVACMD
   /SAS_9.1/sasjre/1.4.2/bin/java $CLOPTS
   -Djava.rmi.server.hostname=10.16.150.72 -Dap.home="${AP_HOME}"
   $OPTIONS com.sas.apps.session.server.Main"$@"
   ```

   Revised command:

   ```
   # was $JAVACMD
   nohup /SAS_9.1/sasjre/1.4.2/bin/java $CLOPTS
   -Djava.rmi.server.hostname=10.16.150.72 -Dap.home="${AP_HOME}"
   $OPTIONS com.sas.apps.session.server.Main"$@" &
   ```

6. Stop and restart the SAS Analytics Platform Server platform server by submitting the following commands:

```
./apserver stop
./apserver -headless start
```

After the SAS Analytics Platform Server server is restarted, the server remains active even when the X Window session closes.

Complete the Post-installation Tasks for All Operating Environments

After you compete the post-installation tasks for the UNIX operating environment, you must complete the post-installation tasks for all operating environments. For information about these post-installation tasks, see "All Operating Systems Administration Tasks" on page 79.

All Operating Systems Administration Tasks

Server Tier

Pre-assign Libraries in SAS Management Console

To use your SAS data sets with SAS Forecast Server, you must enable SAS Forecast Server to access the SAS data sets that contain appropriate input data. To enable SAS Forecast Server to access the input data sets, you must define a SAS library that specifies the data set location. All data sets that exist in selected libraries are displayed. Therefore, to enable SAS Forecast Server to access your data, you must create the following:

- an input SAS data set that contains the appropriate time series data.

- a SAS library that specifies the SAS libref, engine, and path of the input data set

To create an input data set and user-defined library, perform the following steps:

1. Create a SAS data set.
   To enable SAS Forecast Server to read a SAS data set, you can create a SAS program that reads your raw data into a SAS data set.

2. Define the library for the SAS Forecast Server input data set.
   To enable SAS Forecast Server to read the input data set, use SAS Management Console to

define a library that specifies the SAS libref, engine, and path of the input data set. If the library name does not match the libref and no data sets are imported in SAS Management Console, then the libref is shown in SAS Forecast Studio but no data sets are displayed. You can either use the same name for the library and libref or if you use a different name for a library and libref, you must import the data sets in the library manually by using SAS Management Console.

For example, if the library name in SAS Management Console is Forecast but the libref is fsdata, then the libref fsdata appears in SAS Forecast Studio but none of the underlying data sets are displayed. To correct this problem, you must either change the library name in SAS Management Console to match the libref or import the tables in SAS Management Console. You can import the data tables in a newly created library by right-clicking the library name in SAS Management Console and click **Import Tables**.

Use the **Data Library Manager** plug-in of SAS Management Console to define a library that is pre-assigned to a server or servers, and specify the location of the input data set. To specify a library as pre-assigned for a server or servers, perform the following steps:

  a) Open SAS Management Console as the SAS Administrator (e.g., sasadm), and connect to a metadata repository.

  b) Expand the **Data Library Manager** node, and select **SAS Libraries**.

  c) Right-click the library that you want to pre-assign, and select **Properties**.

  d) Select the **Options** tab.

  e) Click **Advanced Options**.

  f) Select the **Library is Pre-Assigned** checkbox. This window is accessible from the Library Options window of the New Library Wizard when you create a new data library.

  g) Ensure that the library is assigned to the correct SAS server(s). The selected library is assigned whenever one of the selected servers starts.

  h) Click **OK**.

3. Add the METAAUTOINIT option to the server definitions. You need to add the METAAUTOINIT option only once in order to retrieve any pre-assigned library definitions.

   When a SAS Workspace Server starts and the METAAUTOINIT option is specified, the SAS Workspace Server connects to the SAS Metadata Server to retrieve any pre-assigned library definitions. The SAS Workspace Servers that are used by SAS Forecast Server require the METAAUTOINIT option in order to retrieve pre-assigned library definitions from the SAS Metadata Server.

   To add the METAAUTOINIT option to a workspace server definition that is used by SAS Forecast Server, perform the following steps:

  a) In SAS Management Console, expand the **Server Manager** node. Fully expand all three levels of **SASMain** and any other logical servers that you defined.

  b) Select a server that is used by SAS Forecast Server
     (e.g., SASMain - Workspace Server, or any other workspace servers that you defined).

  c) Right-click, and select **Properties**.

  d) Select the **Options** tab.

e) In the **Object Server Parameters** field, enter METAAUTOINIT as shown in Figure 9.1, and click **OK**.

f) Repeat the preceding steps for all workspace servers that SAS Forecast Server uses.

Figure 9.1 METAAUTOINIT Option in a Workspace Server Definition

g) Start the SAS Object Spawner. If the SAS Object Spawner is running already, then you must stop and restart the SAS Object Spawner after making this modification in order to retrieve any pre-assigned library definitions.

4. Create the metadata identity for the SAS Forecast Server administrative user (e.g., fsadm). To create the necessary account, metadata identity, and group membership assignments, complete the following steps:

a) Log on to SAS Management Console by opening a metadata profile with your administrative user account (or with an unrestricted user account). Access the foundation repository. You should create all of your user and group definitions in a single foundation metadata repository.

b) In the navigation panel of SAS Management Console, select **User Manager**.

c) Open the **New User properties** dialog box by selecting this path from the menu bar: **Actions**→ **New**→ **User**

d) On the **General** tab, enter the user's name in the **Name** field. The other fields on this tab are optional.

e) On the **Logins** tab, add a login that the metadata server can use to determine the SAS Forecast Server administrative user's metadata identity. This login must contain the fully qualified form of the user ID for the primary account that you created for the SAS Forecast Server administrative user.

f) On the **Groups** tab, define the user's group memberships. Each user can belong to multiple groups.

g) Click **OK** to save and close the user definition.

   NOTE: By default, only administrative users, unrestricted users, and the user who is represented by a particular user definition can make changes to that user definition.

5. Set the metadata permissions on the libraries for the administrator.

   a) In SAS Management Console, expand the **Data Library Manager** node, and select **SAS Libraries**.

   b) Right-click on the library that you want to grant permissions, and select **Properties**.

   c) Select the **Authorization** tab.

   d) Select the SAS Forecast Server administrative user (e.g., fsadm) and grant permissions to the administrative user by checking the **Grant** boxes. All the libraries that you want to use with SAS Forecast Server must have Read and ReadMetadata permissions granted.

6. Set the metadata permissions on the libraries for users.
   NOTE: For a more secure deployment, you can create a SAS Forecast Server group. For information about creating a group, see "Secure Access to SAS Forecast Server" on page 121.

   a) In SAS Management Console, expand the **Data Library Manager** node, and select **SAS Libraries**.

   b) Right-click on the library to which you want to grant permissions, and select **Properties**.

   c) Click the **Authorization** tab.

   d) If the user does not exist in the list when you open the Authorization tab, then perform the following the steps:

      i. Click **Add**.

      ii. Select the user from the Available Identities list in the left pane, and move the user to the Selected Identities list in the right pane by clicking the right arrow.

      iii. Click **OK**.

e) Select the list of user IDs, and grant permissions to the users by selecting the **Grant** boxes. All the libraries that you want to use with SAS Forecast Server must have Read and ReadMetadata permissions granted. For all users that you want to have access at the data library level, grant Read and ReadMetadata permissions.

7. Restart the SAS Object Spawner.

Configure SAS Forecast Server and SAS Add-In for Microsoft Office

What Is the SAS Add-In for Microsoft Office?

The SAS Add-In for Microsoft Office extends the functionality of Microsoft Excel, Microsoft Word, and Microsoft PowerPoint by enabling you to access SAS analytics and SAS reporting functionality without any SAS programming experience. The SAS add-in is designed for people who are familiar with these Microsoft Office programs but who might be new to SAS.

When the SAS add-in is installed on a client machine, a SAS menu and the SAS Analysis Tools toolbar are automatically integrated into Excel, Word, and PowerPoint.

The SAS add-in includes approximately 80 SAS tasks that enable you to perform a variety of analyses. The Forecast Studio Create Project task, the Forecast Studio Open Project task, and the Forecast Studio Submit Overrides task are available in the Analyze Data window.

What Are the SAS Forecast Studio Tasks?

You can use the SAS Add-In for Microsoft Office to run the following SAS Forecast Studio tasks:

- the Forecast Studio Create Project task to create a SAS Forecast Studio project from an Excel or SAS data source

- the Forecast Studio Open Project task to open the results from a selected series in an existing SAS Forecast Studio project

- the Forecast Studio Submit Overrides tasks to submit overrides for the forecast data in an existing SAS Forecast Studio project

Prerequisites for Using the SAS Forecast Studio Tasks

In order to use the SAS Forecast Studio tasks in the SAS Add-In for Microsoft Office, you must complete the following:

- installation of SAS Forecast Server

- installation of the SAS Add-In for Microsoft Office on each client machine, which is a product in the SAS Enterprise Business Intelligence Server bundle

- download of the Forecast Studio Submit Overrides task from the Software Downloads page at **http://www.sas.com/download** to each client machine. Click the **SAS Add-In for Microsoft Office** link to download the task, and follow the instructions in the Readme.txt file.

  NOTE: The Forecast Studio Submit Overrides task is not installed automatically with the SAS Add-In for Microsoft Office. It is only available if you download it.

- configuration of the SAS Forecast Studio Server to use the SAS Add-In for Microsoft Office

Configuration Instructions

In order to use the SAS Add-In for Microsoft and SAS Enterprise Guide with SAS Forecast Server, you must use the SAS Analytics Platform Server that provides an embedded Web server. By default, the SAS Analytics Platform Server is shipped and configured with an embedded Web server.

In order for the SAS Add-In for Microsoft Office functionality to work, you must configure a server in the SAS metadata server by using SAS Management Console. To configure a server, perform the following steps:

1. Open SAS Management Console as the SAS Administrator (e.g., sasadm) and connect to a metadata repository.

2. Right-click on **Server Manager** and select **New Server**.

3. Select the Http Server template and click **Next**.

4. Select **HPF** as the name and click **Next**.

5. Add a new base path by clicking **New**.

6. Type a forward slash (**/**) in the **Base Path** field, and click **OK**.

7. Click **Next**.

8. Provide the host name of the SAS Analytics Platform Server and port number of the embedded Web server. The default port is 6098 unless you changed it in the SAS Analytics Platform Server configuration. Click **Next**.

9. Click **Finish**.

View the SAS Log

If you have problems connecting to the SAS server, then turning on the SAS log might help you. To view the SAS log, perform the following steps:

1. Click on SAS → Options → Results tab.

2. Check **Show SAS log**.

Middle Tier

Create the SAS Forecast Server File Directory

1. Create a `Forecast Studio` directory and `Projects` folder in the BI Manager by performing the following steps:

   a) In SAS Management Console, right-click on the **BI Manager** and select **New Folder**.

   b) Enter `Forecast Studio` as the name of the folder and click **Next**.

   c) Select **No content mapping** and click **Finish**.

   d) Right-click on the **Forecast Studio** folder and select **New Folder**.

   e) Enter `Projects` as the name of the new folder and click **Finish**.

2. If you have not created a SAS Forecast Server administrative user metadata identity, then you must create a SAS Forecast Server administrative user metadata identity or grant administrative permissions to an existing user in the metadata.

   CAUTION: Do NOT use the SAS Administrator (e.g., sasadm) account as the SAS Forecast Server Administrator (e.g., fsadm) account.

3. Grant folder privileges to the SAS Forecast Server administrative user.

   a) Start SAS Management Console by logging on with the SAS administrator account (e.g., sasadm).

   b) Expand BI Manager.

   c) Expand the `Forecast Studio` folder.

   d) Right-click on the **Projects** folder and select **Properties**.

   e) Select the **Authorization** tab and click **Add**.

   f) Move the SAS Forecast Server administrator account (fsadm) to the right hand pane by selecting the administrator account in the left pane and click the single arrow icon between the two panes. Click **OK**.

   g) With the SAS Forecast Server administrator's account selected in the upper pane, click to select all available check boxes under the Grant heading in the lower pane. Click **OK**.

4. If the SAS Analytics Platform Server is not started already, then start the SAS Analytics Platform Server by performing the following steps:
   NOTE: If you installed the SAS Metadata Server on a different machine from the one where you installed the middle tier, then you must change the server information by reconfiguring the SAS Analytics Platform Server. For information about configuring the SAS Analytics Platform Server, see the *SAS Analytics Platform Server Administrator's Guide* at the following Web address:
   http://support.sas.com/documentation/onlinedoc/

   Windows operating environment:

a) Navigate a shortcut that is created to where the SAS Analytics Platform Server is installed:
Start→ Programs→ SAS→ SAS Analytics Platform Server→ Start AP Server

b) If you are prompted for the user name and server location, then specify the following values:
User name: sasadm (SAS Administrative account) and click **Remember my password**.

Server: The server is the name of the server where the SAS Analytics Platform Server is running.

c) Click **LogOn** to start the SAS Analytics Platform Server.

UNIX operating environment:

a) Navigate to the installation directory of the SAS Analytics Platform Server (e.g., !SASROOT/SASAPCore/bin)

b) Run the command `./apserver –headless start`. The server is ready to receive clients when the message "Waiting for clients" appears at the bottom of the screen.
NOTE: If you are running the SAS Analytics Platform Server as a background process, then you do not see this message.

c) If you chose not to persist the user credentials needed to start the server, then you are prompted for a user ID and password. Specify the SAS Administrator user ID (e.g., sasadm) and password. However, for this to work you need an X display session.

5. Run the SAS Forecast Server setup file, which executes the SAS Forecast Server administrative setup. This process must be executed on the physical machine that is running the SAS Analytics Platform Server. However, the script creates a directory structure on the server that contains your SAS Workspace Server, and metadata structures are modified to point to it. By default, the location of the SAS Forecast Server (*forecast-studio-project*) directory is the following:
UNIX: *<config-dir>*/SAS/ForecastStudio
Windows: C:\SAS\ForecastStudio

The SAS Forecast Server administrative user's credentials must be used when running this script, so that the physical path on the SAS Workspace Server machine is created by the SAS Forecast Server administrative user (e.g., fsadm). If the folders are not created by the SAS Forecast Server administrative user, then an error is displayed. You can specify a different default location of the forecast-studio-project directory when you run the SAS Forecast Server setup file.

NOTE: If you change the project location after you created projects in SAS Forecast Server, then using the ForecastStudioSetup script to change the project location only changes the location for new projects. All of your existing projects still reference the original location because this physical location is stored in metadata with the project information, as well as in the project.xml file found in the project directory.

Windows: Run the ForecastStudioSetup.bat script that is located in the following directory:
!SASROOT\SASAPCore\apps\Forecasting\bin

NOTE: If you want to change the file location, then specify a new directory pathname when you execute the ForecastStudioSetup.bat file with the following option:
ForecastStudioSetup.bat "location=<new-directory-pathname>ForecastStudio"

Example:

```
ForecastStudioSetup.bat "location=D:\myprojects\ForecastStudio"
```

UNIX: Run the ForecastStudioSetup.sh script that is located in the following directory:
!SASROOT/SASAPCore/apps/Forecasting/bin

NOTE: If you want to change the file location, then specify a new directory pathname when you execute the ForecastStudioSetup.sh script with the following option:
ForecastStudioSetup "location=<new-directory-pathname>/ForecastStudio"

CAUTION: You cannot use spaces around the equal sign when specifying a project location. (e.g., **"location = D:\myprojects\ForecastStudio"**)
If you use spaces, then the command fails.

Example:

```
ForecastStudioSetup "location=/myprojects/ForecastStudio"
```

A logon dialog box appears. Log on as the SAS Forecast Server administrative user (e.g., fsadm) to the server where you installed the SAS Analytics Platform Server. If you specify the server, then use the form hostname:port.

Import the Default Set of SAS Forecast Server Stored Processes

You can write SAS Stored Processes in order to extend the functionality of SAS Forecast Server. The solution ships with a default set of stored processes that provide report programs, or you can use the default set of stored processes as illustrations of how to use stored processes with SAS Forecast Server.

Tip: Before you modify any of the stored processes that SAS provides, it is recommended that you make a copy of the stored process and make your changes to the copied version of the stored process. You can save your changes to the stored process by saving the stored process with a new name. If you make changes to the original version of the stored process that SAS provides without saving the stored process with a new name, and you want to restore the stored process back to the original version, then you can import the stored process from the solution CD that contains the SAS Forecast Server stored processes.

NOTE: If the SAS Forecast Server Mid-Tier and server tier are installed on two different machines, then you need to copy the StoreProcesses.spk file to the server tier and then import the stored processes by using BI Manager. The default location of the StoreProcesses.spk file is !SASROOT\SASAPCore\apps\Forecasting\samples\StoredProcess.spk

You import the default set of SAS Forecast Server stored processes by performing the following steps:

After the default directory structure for the SAS Forecast Server stored processes is created, you can import the stored processes by using the BI Manager. The BI Manager is part of SAS Management

Console. The default SAS Forecast Server stored processes are provided in a SAS Package file with an extension of .spk, which is created when the SAS Forecast Server Mid-Tier is installed.

1. Start SAS Management Console on the server host and connect to a metadata repository as the SAS Forecast Server Administrator (e.g., fsadm).

   CAUTION: If you have a SAS Management Console session open from a preceding task, then close SAS Management Console and open a new session. You must be logged on to SAS Management Console as the SAS Forecast Server Administrator (e.g., fsadm).

2. Expand the BI Manager as shown in Figure 9.2.

Figure 9.2 BI Manager
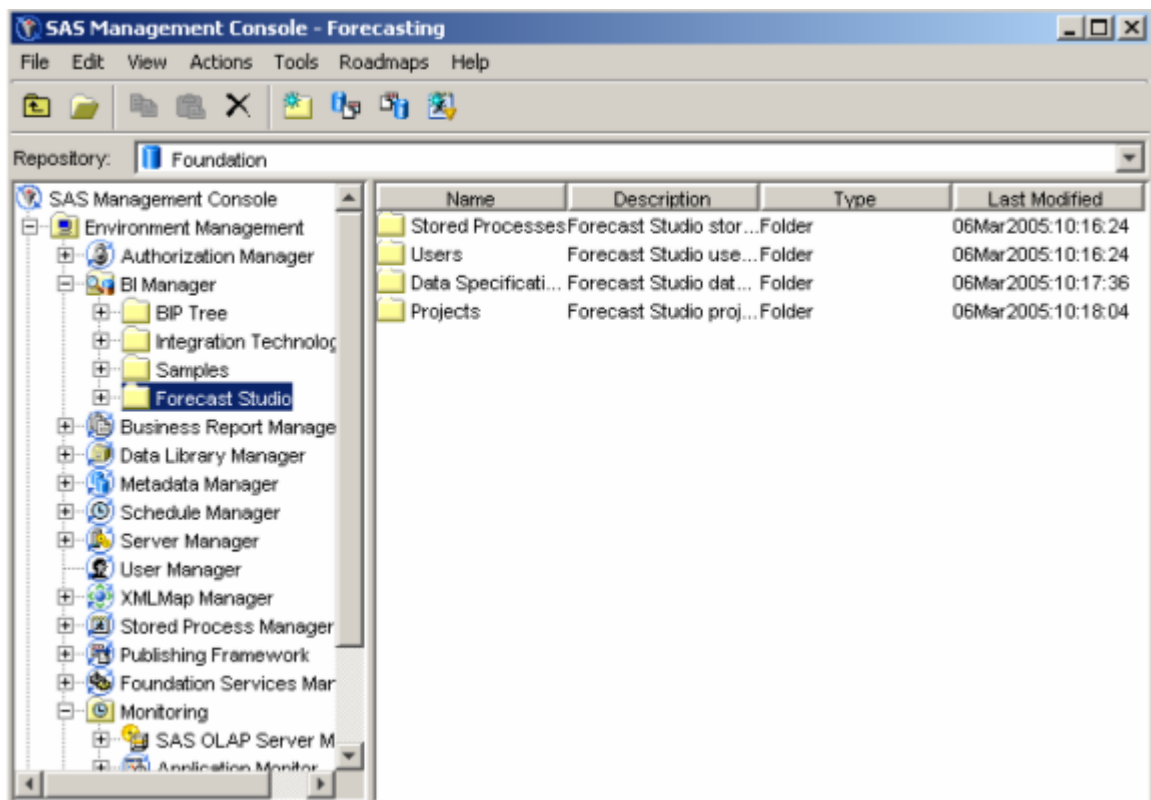
3. Right-click the **Forecast Studio** folder, and select **Import**.

4. Browse to the Forecast Server Mid-Tier installation directory to import the StoredProcesses.spk file:
   !SASROOT\SASAPCore\apps\Forecasting\samples\
   StoredProcesses.spk

   NOTE: Because the SAS Forecast Server Mid-Tier is installed as a SAS Analytics Platform Server application, it is located under the SASAPCore directory.

5. Select **All Objects** as the Import Options and click **Next**.

6. Click **Next** to confirm the selected objects.

7. Click **Next** to select the application server and source code repository.

8. Select the appropriate server and click **Next**. Typically, the server is SASMain. The window where you specify the application servers appears as shown in Figure 9.3.

Figure 9.3 Import Wizard: Original and Target Application Servers
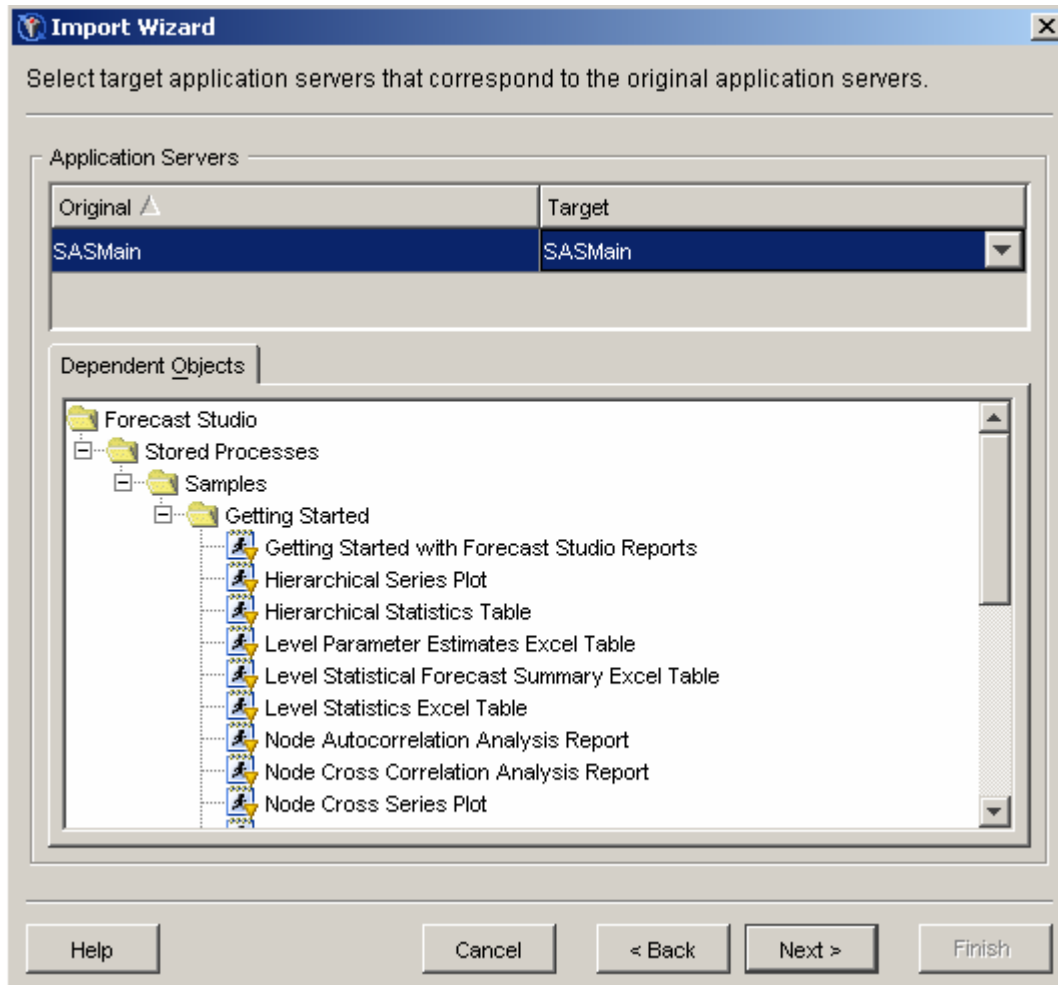
9. Keep the default value in the **Original Path** field. When the stored process directory structure was created in the previous post-installation task, a new source code repository was created as well. Select this entry to specify the target path where you want the stored processes to be imported. This location is the path that you specified above. Click **Next**.

Figure 9.4 shows the window where you specify the target path for the new source code repository.

Figure 9.4 Import Wizard: Target Source Code Repository Paths
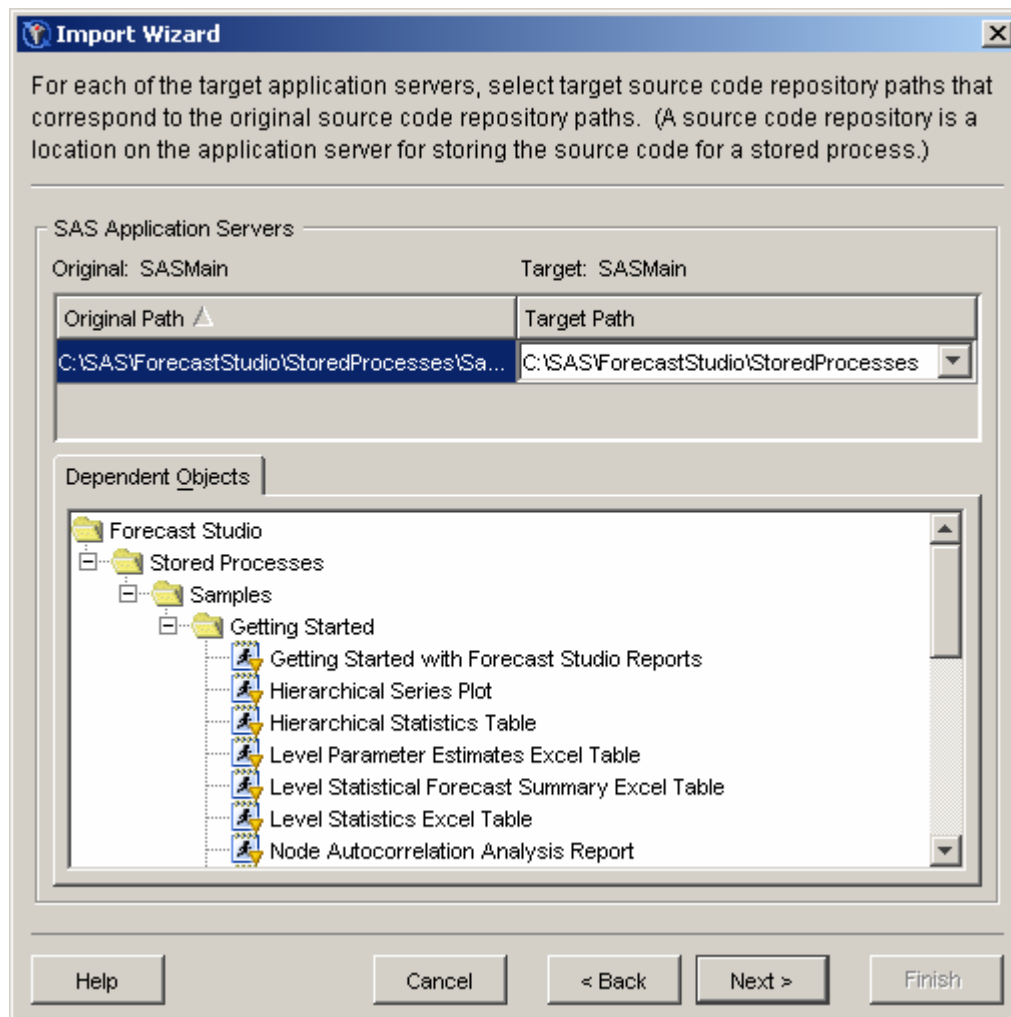
10. Click **Import** at the information step.
    NOTE: You might need to re-authenticate to the metadata server by logging on again. Use the SAS Forecast Server administrative user account (e.g., fsadm).

11. As the BI Manager imports the sample stored processes from the SAS Package file, you see a progress dialog box similar to the one in Figure 9.5.

Figure 9.5 Import Wizard: Information Summary
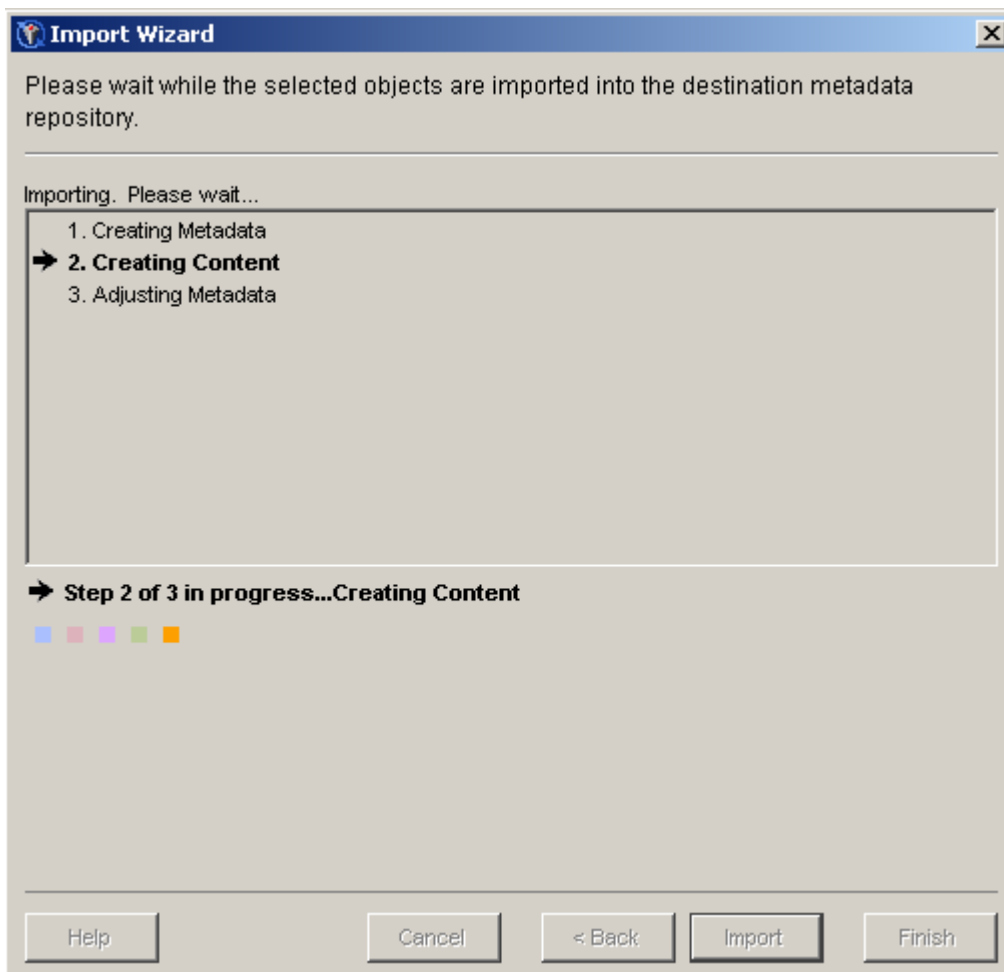
12. When the import is done, you get a summary as shown in Figure 9.6. If everything imported properly, then click **Finish**.

13. Close SAS Management Console.

Figure 9.6 Import Wizard: Summary Window
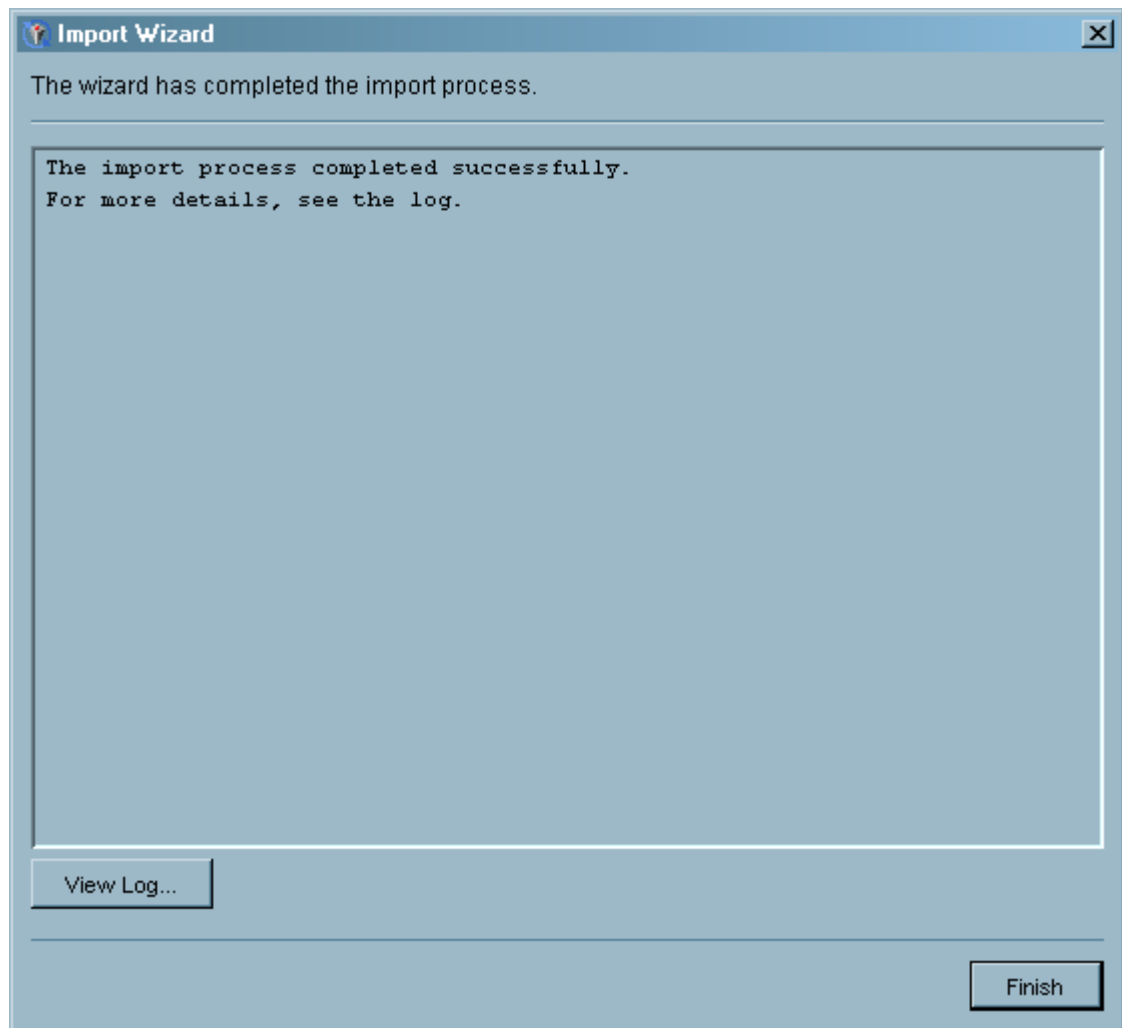
Configure the Stored Process Service

After you import the SAS Forecast Server stored processes, then you must configure the stored process service by using SAS Management Console.

1. Open SAS Management Console and connect to a metadata repository as the SAS Administrator (e.g., sasadm).

2. Expand the **Foundation Services Manager** folder.

3. Expand the **Analytics Platform - Foundation Services** folder.

4. Expand the **Core Services** folder. If there is a **Stored Process Service**, then you do not need to continue.

5. Right-click on the **Core Services** folder, and select **New Service**.

   If prompted, then permit SAS Management Console to import the foundation service prototypes.

6. In the New Service wizard, select **service: Stored Process**. Click **Next**.

7. Enter `Stored Process Service` as the name and a description if you like. Click **Next**.

8. Click **Next** until you reach the last step and click **Finish** to complete the configuration process.

9. Restart the SAS Analytics Platform Server.

Enable the Search for Servers Functionality (Optional)

By default, the server discovery functionality is disabled. When you install the SAS Analytics Platform Server, the default value is false. If you want users to be able to discover the server, then you can use the **AP Server Advanced Configuration** tool to enable the discovery functionality. To enable the server discovery functionality, perform the following steps:

1. Start the Analytics Platform Configuration Wizard tool.
   Windows: Open the AP Server Advanced Configuration tool by selecting
   Start→Programs→SAS→SAS Analytics Platform Server→ AP Server Advanced Configuration

   UNIX: Open the AP Server Advanced Configuration tool by performing the following steps:

   a) Open a terminal session with an X server running and available.

   b) Navigate to the . . . /SASAPCore/bin directory.

   c) Issue the following command:
      ```
      ./apserver config
      ```

2. After the Analytics Platform Configuration Wizard starts, proceed to step 2 of the wizard.

3. Check the **Allow clients to discover this server** checkbox as shown in Figure 9.7.

   NOTE: There are limitations to the server discovery. Servers must be on the same subnet as the client and if there are firewalls that restrict UDP multicast messages, then the discovery does not function.

Figure 9.7 SAS Analytics Platform Server Configuration Wizard —Step 2 of 4

4. Click **Next** until you reach the last step. Click **Finish**.

Windows Administration Tasks

Complete the Post-installation Tasks for All Operating Environments

Before you compete the post-installation tasks for the Windows operating environment, you must complete the post-installation tasks for all operating environments. For information about these post-installation tasks, see "All Operating Systems Administration Tasks" on page 79.

Server Tier

Set File System Permissions

On a Windows server, allowing SAS users with differing permissions to update a file creates a security setup issue that needs to be corrected. You must set file system permissions for all SAS users to be the same in the areas that are used by SAS Forecast Server.

To set file system permissions for all SAS users to be the same, perform the following steps:

1. Open Windows Explorer and select the root directory used by SAS Forecast Server. By default, the directory is C:\SAS\ForecastStudio.

2. Right-click and select **Properties**.

3. Click the **Security** tab.

4. Select the users for the current machine.

5. Enable **Full Control** for the specified group of users.

6. Click **OK**.

NOTE: Because temporary files are created in the BI directory as well, you should apply the appropriate security to this directory. The default directory is C:\SAS. By default, the BI directory is the parent of the `ForecastStudio` folder. If this is true, then you need to set the security on the parent directory only.

Middle Tier

Configure the SAS Analytics Platform Server as a Windows Service

By default, the SAS Analytics Platform Server is not installed as a Windows service. It is recommended that you install the SAS Analytics Platform Server as a Windows service. When you install the SAS Analytics Platform Server as a Windows service, the SAS Analytics Platform Server restarts when its machine reboots and runs even when users log off of the machine.

You can install and start the SAS Analytics Platform Server as a Windows service by performing the following steps:

1. If the SAS Metadata Server is installed on the same machine as the SAS Analytics Platform Server, then modify the !SASROOT\SASAPcore\conf\wrapper.conf file.

   a) Open your Windows services by selecting
      Start→Settings→Control Panel→Administrative Tools→Services. Look for the

SAS metadata service (i.e. SAS Lev1 MS - Forecast), as shown in the example in Figure 9.8. You must use the exact name of the service in the next step.

Figure 9.8 SAS Lev1 MS - Forecast Service

b) Near the end of the file, you see a property `wrapper.ntservice.dependency.1=` *value*. The *value* must be the exact name of the metadata service from the preceding step, as shown in the example in Figure 9.9 .

Figure 9.9 Property Value for `wrapper.ntservice.dependency.1=` Entry

```
111  # Service dependencies.  Add dependencies as needed starting from 1
112  # rjc - service dependency.
113  # NOTE: If you are running the metadata server on another machine,
114  # comment out the following line:
115  wrapper.ntservice.dependency.1=SAS Lev1 MS - Forecast
116
117  # Mode in which the service is installed.  AUTO_START or DEMAND_START
118  wrapper.ntservice.starttype=AUTO_START
119
120  # Allow the service to interact with the desktop.
121  wrapper.ntservice.interactive=false
```

By default, the SAS Analytics Platform Server service is configured to include the SAS Metadata Server as a dependency. If you choose to run the metadata server on another machine, then this dependency must be removed. To remove the dependency, perform the following steps:

a) Navigate to the !SASROOT\SASAPcore\conf\ directory.

b) Edit the wrapper.conf file. Comment out the following line that is located near the end of the file by adding a # character at the start of the line as follows:
   # wrapper.ntservice.dependency.1=*value*

2. Navigate to the !SASROOT\SASAPCore\bin path at a DOS prompt, and run the `AnalyticsPlatformService.bat install` command. This script installs the SAS Analytics Platform Server as an automatic service, but does not start the SAS Analytics Platform Server initially.

3. Start the service from the Services application as shown in Figure 9.10, or by using the `AnalyticsPlatformService start` command, or by rebooting the machine.

Figure 9.10 SAS Analytics Platform Server Starts as a Service

The SAS Analytics Platform Server is configured to start automatically when your computer boots, so you should not have to start the SAS Analytics Platform Server manually in the future.

NOTE: To uninstall a server that is installed as a service, perform the following steps:

1. Navigate to the !SASROOT\SASAPCore\bin path at a DOS prompt, and run the `AnalyticsPlatformService.bat stop` command.

2. Run the `AnalyticsPlatformService.bat remove` command.

Chapter 10

Verify SAS Forecast Server Installation

Contents

Start and Verify the SAS Servers

What Are the SAS Servers?

For more information about the SAS servers, refer to the SAS Intelligence Platform documentation set. You can access the SAS Intelligence Platform documentation set in the SAS OnlineDoc at the following Web address:

http://support.sas.com/onlinedoc/913/docMainpage.jsp

Before you start your client application, you must have the following SAS servers and object spawner running:

- SAS Metadata Server

- SAS Object Spawner

- SAS Workspace Server(started by the SAS Object Spawner)

- SAS Stored Process Server (started by the SAS Object Spawner)

- SAS Analytics Platform Server

Each server or object spawner is represented by a directory inside the **SASMain** directory. For example, you might see a **WorkspaceServer** folder or an **ObjectSpawner** folder. If you choose to start the servers by using scripts, then each directory for a server that you can start directly contains a script called start*server-type.extension*.

- On UNIX operating environments, you call these scripts directly to start servers and spawners.

- On Windows operating environments, you can call these scripts directly by using the Start menu. For example, select
  Start→**Programs**→**SAS**→*configuration-directory*→ **Start SAS Object Spawner**.

SAS Metadata Server

Definition

The SAS Metadata Server controls access to a central repository of metadata, which is shared by all of the applications in the system. This repository contains metadata that represents items such as SAS servers, users, libraries, and data sets. For more information about the SAS Metadata Server, refer to the SAS Intelligence Platform documentation set, which can be found in the SAS OnlineDoc at
http://support.sas.com/onlinedoc/913/docMainpage.jsp.

Verify the SAS Metadata Server Is Running

Windows Operating Environment

If your SAS Metadata Server is running on a Windows machine and you choose to run the servers as services, then the servers start automatically when you restart your machine. However, you can use the services window to stop or restart services by performing the following steps:

1. Navigate to the Services window by selecting:
   Settings→**Control Panel**→**Administrative Tools**→**Services**.

2. Right-click the server item.

3. Select **Start**, **Stop**, or **Restart**.

If your server is running on a Windows machine and you choose to start the servers by using scripts, then start the servers by using the **Start** menu and selecting:
StrongStart→Program→SAS→ *configuration-directory*→Start SAS Metadata Server.

NOTE: You can start a server by executing a .bat file. You find the .bat file for a particular server in the following folder:
path-to-config-dir\Lev1\SASMain\MetadataServer

UNIX Operating Environment

On a UNIX operating environment, you start a server by performing the following steps:

1. Log on using the SAS installer account.

2. Navigate to the following path:
   path-to-config-dir/Lev1/SASMain/MetadataServer

3. Execute the script in the directory that starts the server.

SAS Workspace Server

Definition

The SAS Workspace Server executes any type of SAS program. The SAS Object Spawner starts the SAS Workspace Server. For more information about the SAS Workspace Server, see the *SAS Integration Technologies Administrator's Guide*.

Test the SAS Workspace Server Connection

You can test your connection to the SAS Workspace Server by performing the following steps:

1. Start a SAS Management Console session, and log on as a SAS Administrator (e.g., *sasadm*).

2. Expand the **Server Manager** node.

3. Expand the **SASMain** node.

4. Expand the **SASMain-Logical Workspace Server** node.

5. Select **SASMain-Workspace Server**.

6. In the right panel, right-click **Connection: SASMain - Workspace Server**.

7. Select **Test Connection** as shown in Figure 10.1.

8. Enter the SAS Demo User account (e.g., sasdemo). A Test Connection Successful message appears.

Figure 10.1 SAS Workspace Server: Test Connection
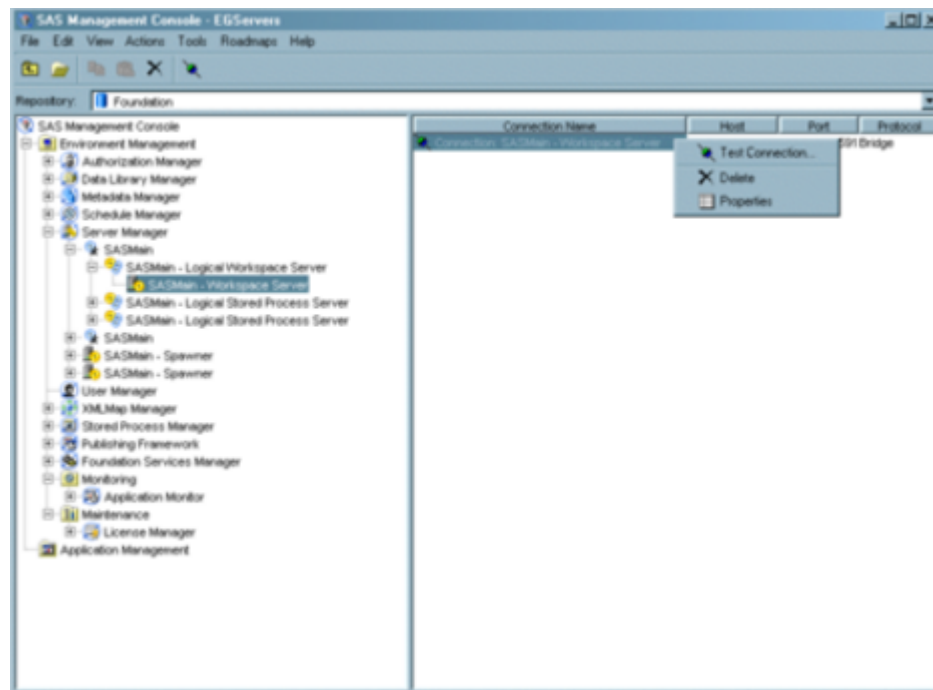
SAS Stored Process Server

Definition

The SAS Stored Process Server executes stored processes, which support input parameters. The SAS Object Spawner starts the SAS Stored Process Server. For more information about the SAS Stored Process Server, see the *SAS Integration Technologies Administrator's Guide*.

Test the SAS Stored Process Server Connection

You can test your connection to the SAS Stored Process Server by performing the following steps:

1. Start a SAS Management Console session, and log on as a SAS Administrator (e.g. *sasadm*).

2. Expand the **Server Manager** node.

3. Expand the **SASMain** node.

4. Expand the **SASMain-Logical Stored Process Server** node.

5. Select **SASMain-Stored Process Server**.

6. In the right panel, right-click **Connection: SASMain - Stored Process Server**.

7. Select **Test Connection** as shown in Figure 10.2. A Test Connection Successful message appears.

Figure 10.2 Stored Process Server: Test Connection
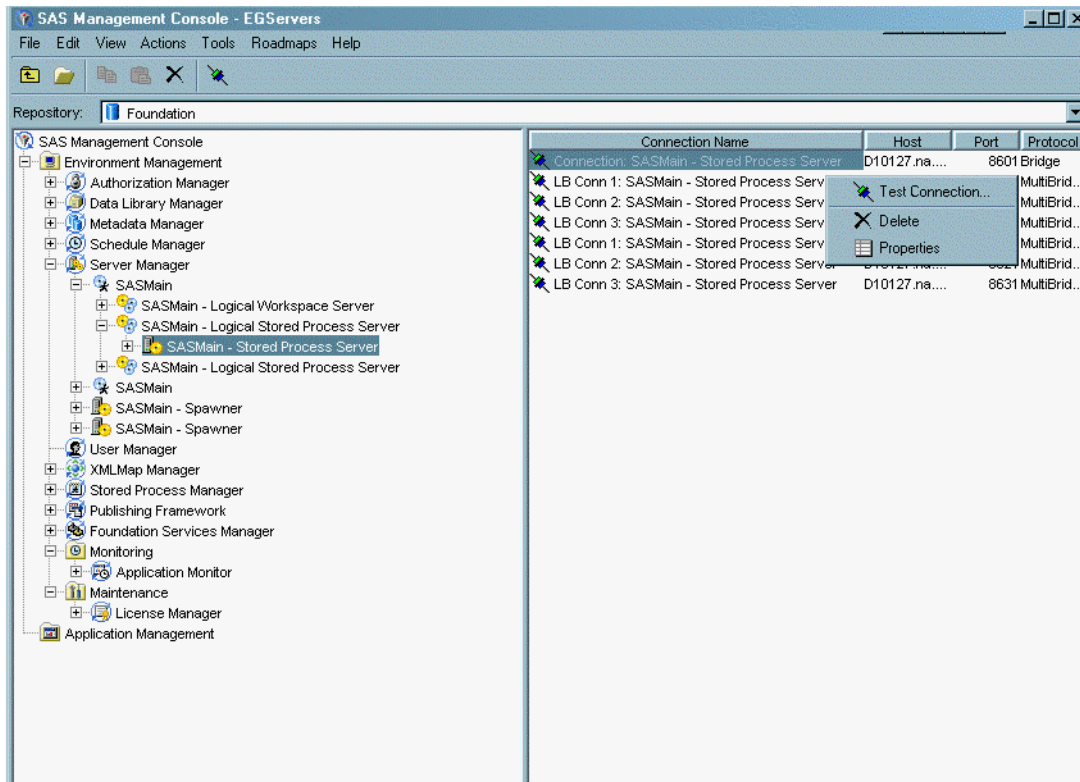
SAS Analytics Platform Server

Definition

The SAS Analytics Platform Server is a RMI middle-tier server that enables SAS Forecast Server to use the SAS Foundation Services. The SAS Forecast Server Mid-Tier must be installed on the same machine as the SAS Analytics Platform Server. You must start the SAS Analytics Platform Server before you start the SAS Forecast Studio client. For information about the SAS Analytics Platform Server, see the *SAS Analytics Platform Server User's Guide* at the following Web address:

http://support.sas.com/documentation/onlinedoc/apcore

SAS Object Spawner

Definition

The SAS Object Spawner is a process-spawning service that represents object servers that use the IOM bridge protocol engine, such as the SAS Workspace Server and the SAS Stored Process Server. In effect, the object spawner is a daemon on the server that listens for incoming client requests for IOM services. When the daemon receives a request from a new client, it launches an instance of either a SAS Workspace Server or a SAS Stored Process Server to fulfill the request. After the request is fulfilled, and nothing else is in the spawner's queue, then the spawner returns to its wait state. For more information about the SAS Object Spawner, refer to the *SAS Integration Technologies Administrator's Guide*.

Start the SAS Object Spawner, SAS Workspace Server, and SAS Stored Process Server

Windows Operating Environments

If the SAS Object Spawner is running on a Windows machine and you choose to run the servers as services, then the servers start automatically when you restart your machine. When the SAS Object Spawner starts, then the SAS Workspace Server and the SAS Stored Process Server start automatically. However, you can stop or restart services by performing the following steps:

1. Navigate to the Services window:
   Settings→ **Control Panel** → **Administrative Tools** → **Services**.

2. Right-click the server item.

3. Select **Stop** or **Restart**.

If your server is running on a Windows machine and you have chosen to start the servers by using scripts, then start the servers by using the **Start** menu and selecting:
Start→**Program** →**SAS** → *configuration-directory* →**Start SAS Object Spawner**.

UNIX Operating Environments

On a UNIX environment, you start a server by performing the following steps:

1. Log on using the SAS installer account.

2. Change directories to *path-to-config-dir*/Lev1/SASMain/ObjectSpawner.

3. Execute the script in the directory that starts the server.

Verify Your SAS Forecast Server Installation

You can verify the successful installation of SAS Forecast Server by starting the client on a Windows machine where you installed the client, and by creating a project.

1. You can start the SAS Forecast Studio client by performing the following steps:

   a) Navigate to the SAS Forecast Studio client by selecting:
      Start → Programs → SAS →SAS Forecast Studio → SAS Forecast Studio 2.1.

   b) In the Log On dialog box, enter your user ID and password, and specify a server with a fully qualified <*server-name:port-number*> name.

   c) Click **Log On**.
      NOTE: For more information about different ways to start the SAS Forecast Studio client, see Chapter 11, "Start the SAS Forecast Studio Client."

2. To create a new project when you open SAS Forecast Studio, select **Create a new project** in the Welcome to SAS Forecast Studio dialog box.

3. Specify the name of the project such as **Test_Project**. By default, the project name is Project*n* , where *n* is the lowest available integer value. The project name must be a valid SAS name. The project name can be 32 characters long, and it must start with a letter (A-Z). Subsequent characters can be letters or numeric digits (0-9). Both upper- and lowercase letters are valid. Click Next.

4. In the New Project Wizard, select a data set by double-clicking the library **SASHELP**.

5. Select the data set **ORSALES**.

6. Assign variables to the following roles:

   a) Move the YEAR variable to the TIME_ID role.

   b) Move the PROFIT variable to the DEPENDENT VARIALBE role.

   c) Click **Next**.

7. Click **Next** to move to the next step.

8. Click **Next** to move to the next step.

9. Select **Produce Forecasts** and click **Finish**.

One series is forecasted, and your installation is complete and verified. For information about ongoing and optional administrative tasks, see Chapter 12, "Administration Tasks." For information about troubleshooting SAS Forecast Server, see Chapter 14, "Troubleshooting SAS Forecast Server."

Chapter 11

Start the SAS Forecast Studio Client

Contents

Required Servers

Before running the SAS Forecast Studio client application, you must have the following servers running:

- SAS Metadata Server

- SAS Workspace Server

- SAS Analytics Platform Server

Because the SAS Analytics Platform Server starts the SAS Forecast Server Mid-Tier automatically, you must be running the SAS Analytics Platform Server on the middle tier before you start the SAS Forecast Studio client. If the SAS Analytics Platform Server is not running as a service, then the SAS Forecast Server Mid-Tier is started automatically when you start the SAS Analytics Platform Server.

Start the SAS Analytics Platform Server

Windows Environment

If you did not configure the SAS Analytics Platform Server to run as a service, then to start the SAS Analytics Platform Server in a Windows environment, perform the following steps:

1. On the middle tier server, start the SAS Analytics Platform Server by selecting:
   Start → Programs → SAS → SAS Analytics Platform Server → Start AP Server.

2. In the Log On dialog box, verify the following values:

   - User name: If you would like the user name and password values to persist whenever you start the SAS Analytics Platform Server, then click **Remember my password**.
   - Server: The server should be the hostname:port of the server where the SAS Analytics Platform Server is running.

3. Click **Log On** to start the SAS Analytics Platform Server.

UNIX Environment

To start the SAS Analytics Platform Server in a UNIX environment, perform the following steps:

1. On the middle tier server, navigate to the installation directory of the SAS Analytics Platform Server
   (e.g., **!SASROOT/SASAPCore/bin**)

2. Run the command `./apserver -headless start`. The server is ready to receive clients when the message "Waiting for clients" appears at the bottom of the screen.

3. If you chose not to persist the user credentials needed to start the server, then you are prompted for a user ID and password. However, for this to work you either need to be in an X display session, or you need to run the .apserver configuration and store those credentials prior to starting the server. The recommended approach is to store the credentials.

NOTE: After you complete the installation of Service Pack 4, the `apserver.sh` script might not be able to find the correct Java version. You might need to update the script to specify the new JRE 1.4.2 path. To update the `apserver.sh` script, perform the following steps:

1. Navigate to the location of the `apserver.sh` script. By default, the path is the following:
   !SASROOT/SASAPCore/bin

2. Locate the following command lines in the script:
   ```
   # was $JAVACMD
   !SASROOT/sasjre/1.4.2/bin/java
   ```

3. Change the above lines to the following:
   ```
   # was $JAVACMD
   !SASROOT/sasjre/1.4.2/jre/bin/java
   ```

   NOTE: !SASROOT is the path where you installed SAS.

4. Save these changes to `apserver.sh`.

Start the SAS Forecast Studio Client

The SAS Forecast Studio client can be run on a Windows operating system only. To start the SAS Forecast Studio client, perform the following steps:

1. Navigate to the SAS Forecast Studio client by selecting:
   Start → Programs → SAS → SAS Forecast Studio → SAS Forecast Studio 2.1.

2. In the Log On dialog box, enter your user ID and password, and specify a SAS Forecast Server Mid-Tier location.

   - User name: If you would like the user name and password values to persist whenever you start SAS Forecast Studio, then click **Remember my password**.
   - Server: The server should be the name of the server where the SAS Analytics Platform Server is running.

3. Click **Log On** to start the SAS Forecast Studio client.

Anonymous Logon (Optional)

Configure the Anonymous Logon Feature

Both the SAS Analytics Platform Server and SAS Forecast Server applications support anonymous logons. By default, the anonymous logon feature is disabled. To enable anonymous logons, you must configure the SAS Analytics Platform Server by using the **AP Server Advanced Configuration** wizard:

1. On the middle tier, access the **AP Server Advanced Configuration** wizard:
   Windows: Select

> **Start → Program → SAS → SAS Analytics Platform Server → AP Server Advanced Configuration**
> **UNIX:** Run the `./apserver config` command

2. In step 3 of the wizard, specify the user ID and password for which you want to enable anonymous logon ability. The user ID and password are used for authentication.

Figure 11.1 Anonymous Access Screen
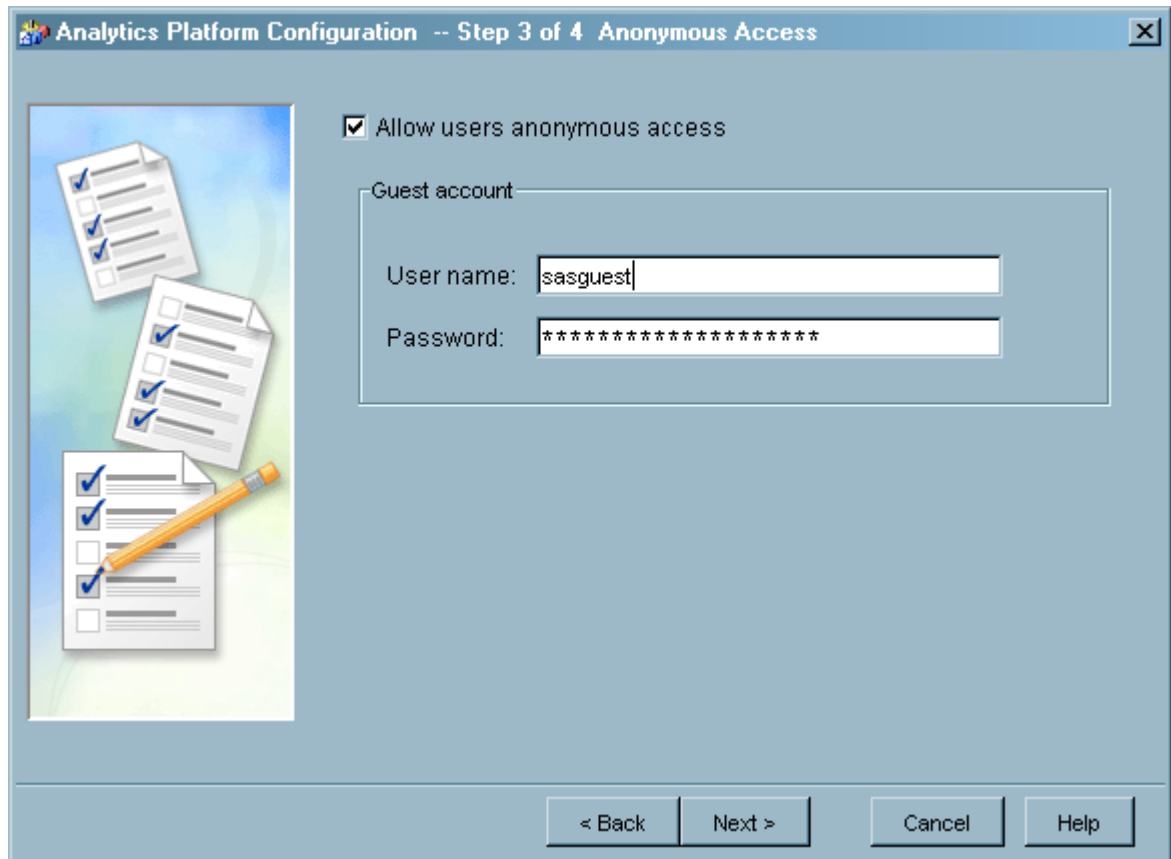
3. If the anonymous logon feature is enabled while the SAS Analytics Platform Server is running, then you must restart the SAS Analytics Platform Server.

Start the SAS Forecast Studio Client with an Anonymous Logon

Once you enabled the anonymous logon feature, then you can log on to a SAS Forecast Studio client by leaving the user name blank.

1. Navigate to the SAS Forecast Studio client by selecting:
   Start → Programs → SAS → SAS Forecast Studio → SAS Forecast Studio 2.1.

2. In the Log On dialog box, leave your user ID and password blank, and specify a SAS Forecast Server Mid-Tier location. You must specify the **Server**. The server is the name of the server

where the SAS Analytics Platform Server is running. If you do not remember which server to use, then you can search for a server by performing the following steps:

    a) Select **Search for Servers** from the **Server** drop-down menu.

    b) Once the search is complete, click on the drop-down menu arrow for the list of valid servers that you can choose. The valid servers are indicated by green check marks.

3. Click **Log On** to start the SAS Forecast Studio client.

SAS Forecast Studio Java Web Start

SAS Forecast Server supports automatic downloads of the SAS Forecast Studio client by using Java Web Start. You no longer need to install the client application manually.

You can use the Java Web Start in one of two ways:

- Launch the SAS Forecast Studio client from the **SAS Analytics Platform Server Server Status** Web page.

  The SAS Analytics Platform Server has a status and configuration Web page that is installed on the SAS Forecast Server Mid-Tier. The SAS Analytics Platform Server already contains an HTTP server, which is used to deliver the Web pages that contain links to Java Web Start at
  `http://your-server-name:6098`. By default, the HTTP port for the SAS Analytics Platform Server is 6098. If you installed the SAS Analytics Platform Server by using a different port, then you must specify the port number that you used.

  From the **Welcome** page, you can click on the **Configuration** tab to view not only the SAS Analytics Platform Server configuration details, but also any applications that have been configured on the server. To launch a configured application, simply click on the **Launch** link.

- Launch the SAS Forecast Studio client from a direct link to the SAS Forecast Server Java Web Start

  The direct link to launch the SAS Forecast Studio client is the following:
  `http://your-server-name:8080/Forecasting/main.jnlp`

For more information about Java Web Start, see the Sun Web site at the following Web address:
`http://java.sun.com/products/javawebstart/`

For information about Java Web Start and SAS applications, see the *SAS Analytics Platform Server User's Guide* at the following Web address:
`http://support.sas.com/documentation/onlinedoc/apcore`

For information about troubleshooting the SAS Forecast Studio Java Web Start, see Chapter 14, "Troubleshooting SAS Forecast Server."

Part IV

Administration and Troubleshooting

Chapter 12

Administration Tasks

Contents

Administration Tasks Checklist

There are administration tasks that you can perform manually after you successfully install and configure your SAS Forecast Server software. Some of the administration tasks can be done as needed, while other tasks can be done in anticipation of future needs. Table 12.1 is a tool that you can use to navigate to the task that you need.

Table 12.1 Administration Tasks Checklist

All Operating Environments	Task
Server tier	Enable users to access SAS Forecast Server.
Server tier	Secure access to SAS Forecast Server.
Server tier	Configure a SAS Forecast Server report as a stored process.
Server tier	Use a customized format in SAS Forecast Server.
Middle tier	Change the location where user projects are saved.
Windows Operating Environment	
Middle Tier	Change the SAS Analytics Platform Server default port for forecasting from within SAS Add-in for Microsoft Office.

Administration Tasks for All Operating Environments

Server Tier

Enable Users to Access SAS Forecast Server

Authentication versus Authorization

Before learning about authorizations within SAS Forecast Server, first you need to understand the difference between user authentication and user authorization.

- User authentication is an identity verification process that attempts to determine whether users are who they say they are.

- User authorization is the process of determining which users have which permissions for which resources. User authorization happens after user authentication.

For more information about the SAS security scheme, see the security section of the SAS Intelligence Platform documentation set. You can access the SAS Intelligence Platform documentation set in the SAS OnlineDoc at the following Web address:
http://support.sas.com/onlinedoc/913/docMainpage.jsp

Initial Authentication

Initial authentication is the verification of your identity based on information that you provide when you log on to SAS Forecast Server. Initial authentication requires that you have an account with the authentication provider that verifies the user ID and password that you submit. The account can be any of the following:

- a local user account in the operating system of the computer on which the authenticating server is running

- a network user account that provides access to the operating system of the computer on which the authenticating server is running

- a user account with any authentication provider that your Web application server uses (for applications that are configured to use Web authentication)

After the user ID and password that you submit are verified by the appropriate authentication provider, the proof-of-identity is complete. None of the user information that is stored in the metadata repository is used to prove your identity. The metadata server must discover your metadata identity for these reasons:

- In order to provide authorization decisions and credential management, the metadata server needs to know who you are.

- SAS Forecast Server has an additional requirement beyond proof-of-identity and does not allow you to log on unless you have a metadata identity.

  In order to discover your metadata identity, the metadata server examines the user IDs that are stored in the metadata repository. Passwords that are stored in the metadata repository are not examined at any point during initial authentication.

SAS Metadata Authorization

SAS Forecast Server uses the metadata server for metadata authorization. Access permissions are defined and stored in the metadata repository. SAS Forecast Server checks for access permissions in the following ways:

- The current user must have Read permission to the input SAS data set that is used for forecasting.

- The current user must have Read permission to all of the variables within the SAS data set if the variables are to have assigned roles in the forecasting.

SAS Forecast Server silently filters any data sets and variables to which the current user does not have Read permissions granted. Users who attempt to open an existing project for which they do not have Read permissions get an error that says that they are not authorized to view the forecasts.

NOTE: Because all SAS Intelligence applications use the SAS Metadata Server when accessing resources, permissions that are enforced by the SAS Metadata Server provide the strongest protections that are available in the metadata authorization layer.

Initial Users

After you install and configure the SAS Intelligence Platform, SAS Analytics Platform Server, and SAS Forecast Server, you have some initial users and group definitions.

Figure 12.1 shows the initial users and groups in the User Manager plug-in of SAS Management Console:

Figure 12.1 Initial Users and Groups for SAS Forecast Server
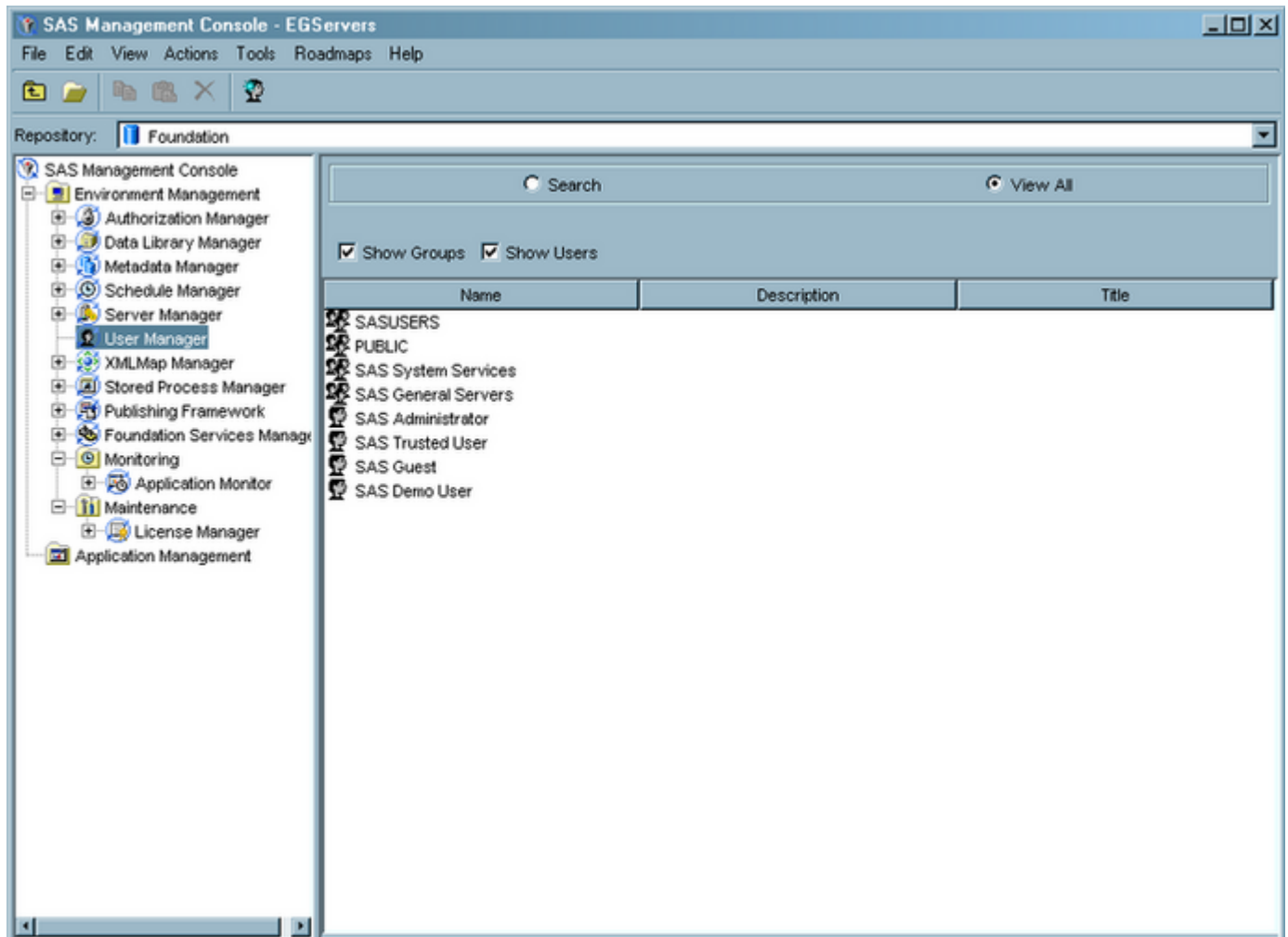
Define Additional Users

If you want to log on to the SAS Forecast Studio client as a different user, then you must define the user ID on the authentication provider and in SAS Management Console. By using the User Manager plug-in of SAS Management Console, you can define additional users and groups for SAS Forecast Server. You must define new users on the appropriate authentication provider.

You can define a new user or group by performing the following steps:

1. Start SAS Management Console, and connect to a metadata repository as an administrator (for example, sasadm).

2. From the SAS Management Console navigation tree, right-click **User Manager** and select **New→User** (or **Group** if you are defining a new group of users). Figure 12.2 shows the General tab of the User Manager definition for a new user.

Figure 12.2 New User Definition for SAS Forecast Server

For more information about how to define users and groups in SAS Management Console, see the *SAS Management Console User's Guide* and the Online Help for the User Manager at the following Web address:

http://support.sas.com/documentation/onlinedoc/sasmc/index.html

3. Associate this metadata identity with a specific account that is valid on the metadata server. By default, the SAS Metadata Server uses host-based authentication. Unless you configured your system differently, the metadata server requires a user ID and password that is valid on the host operating system of the metadata server. You can associate a metadata identity with a user ID by performing the following steps:

   a) Within the New User wizard, select the **Login** tab and click **New**.

b) In the dialog box, enter the user ID that you plan to use to log on to the SAS Metadata Server. Figure 12.3 shows an example of associating an identity with the user ID *newuser*.

NOTE: Typically, a password is not required.

Figure 12.3 Associated Metadata Identity for a User ID
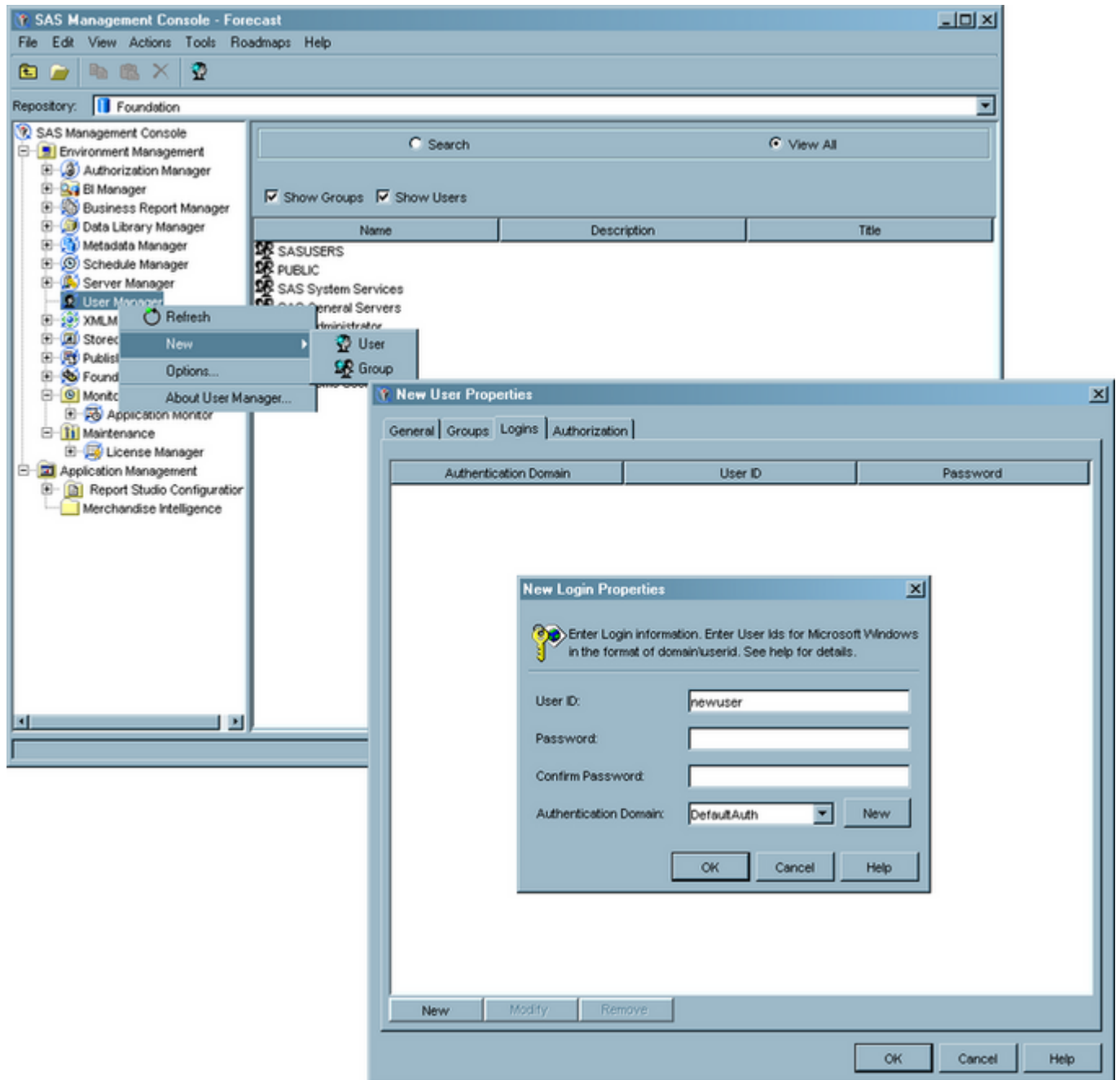
For more information about planning and defining new users and groups, see the security section of the SAS Intelligence Platform documentation set that you can access in the SAS OnlineDoc at the

following Web address:
http://support.sas.com/onlinedoc/913/docMainpage.jsp

Secure Access to SAS Forecast Server

What Permissions Can You Control?

To secure access to metadata objects that represent SAS Forecast Server data, you can grant or deny permissions to individuals or groups by using the Authorization tab for the following metadata objects:

- SAS data sets

- variables within SAS data sets

View User Permissions

The following example illustrates how to set user permissions and how SAS Forecast Server reacts to these permissions. In the example, you can use the following users and library:

sasadm

    specifies the SAS Administrator (for example, sasadm). By default, the SAS Administrator is authorized to read all data.

sasdemo

    specifies the SAS Demo User (for example, sasdemo). By default, the SAS Demo User is *not* authorized to read any data.

TESTLIB

    specifies the test library for SAS Forecast Server. It is assumed that this library is pre-assigned. For information about pre-assigning libraries, see Chapter 9, "Post-installation Tasks."

The following exercise shows the differences between the sasadm user and the sasdemo user when each user creates a new project. When the TESTLIB library is selected, Figure 12.4 shows all of the SAS data sets that are available to the sasadm user for selection.

Figure 12.4 Available SAS Data Sets for sasadm User
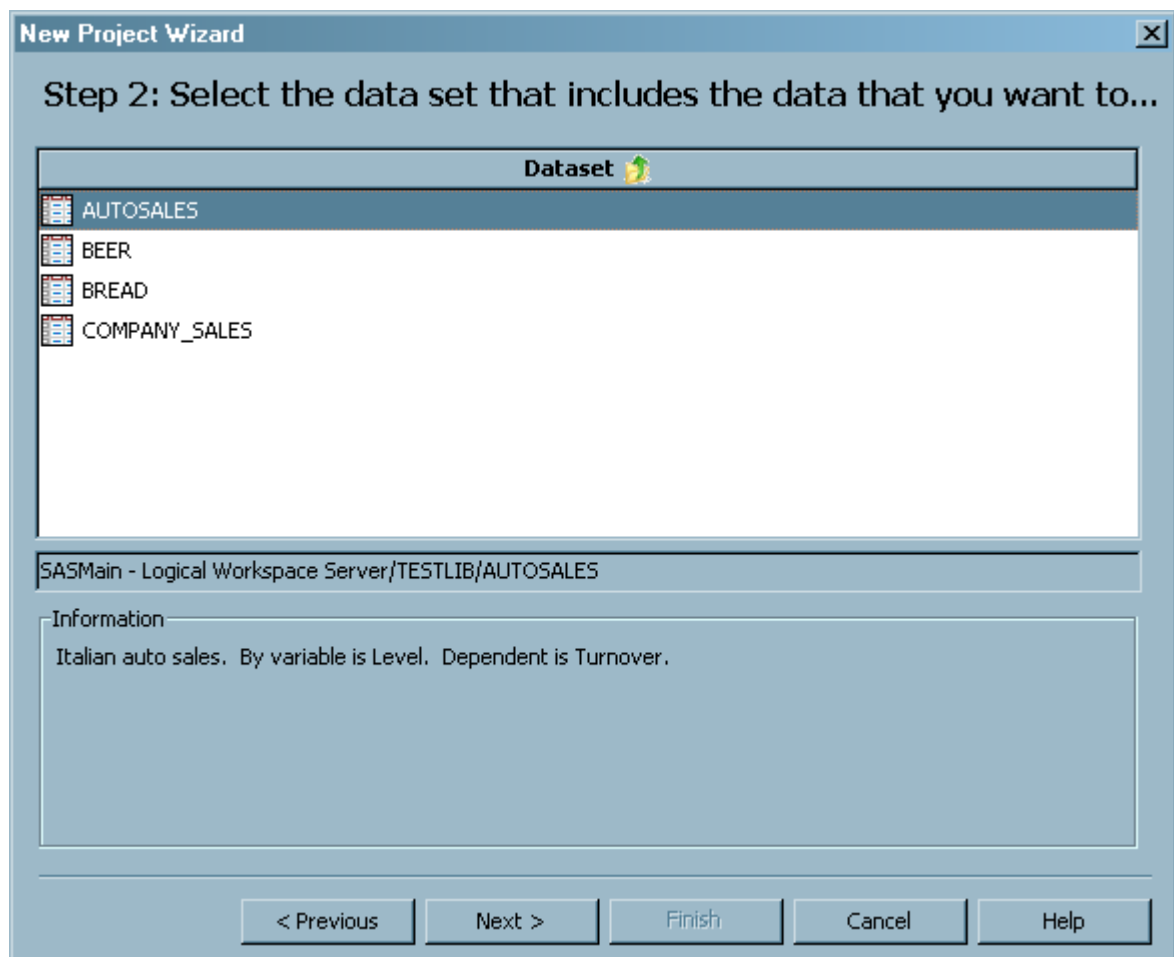
Conversely, Figure 12.5 shows that no SAS data sets are available to the sasdemo user for selection.

Figure 12.5 Available SAS Data Sets for sasdemo User
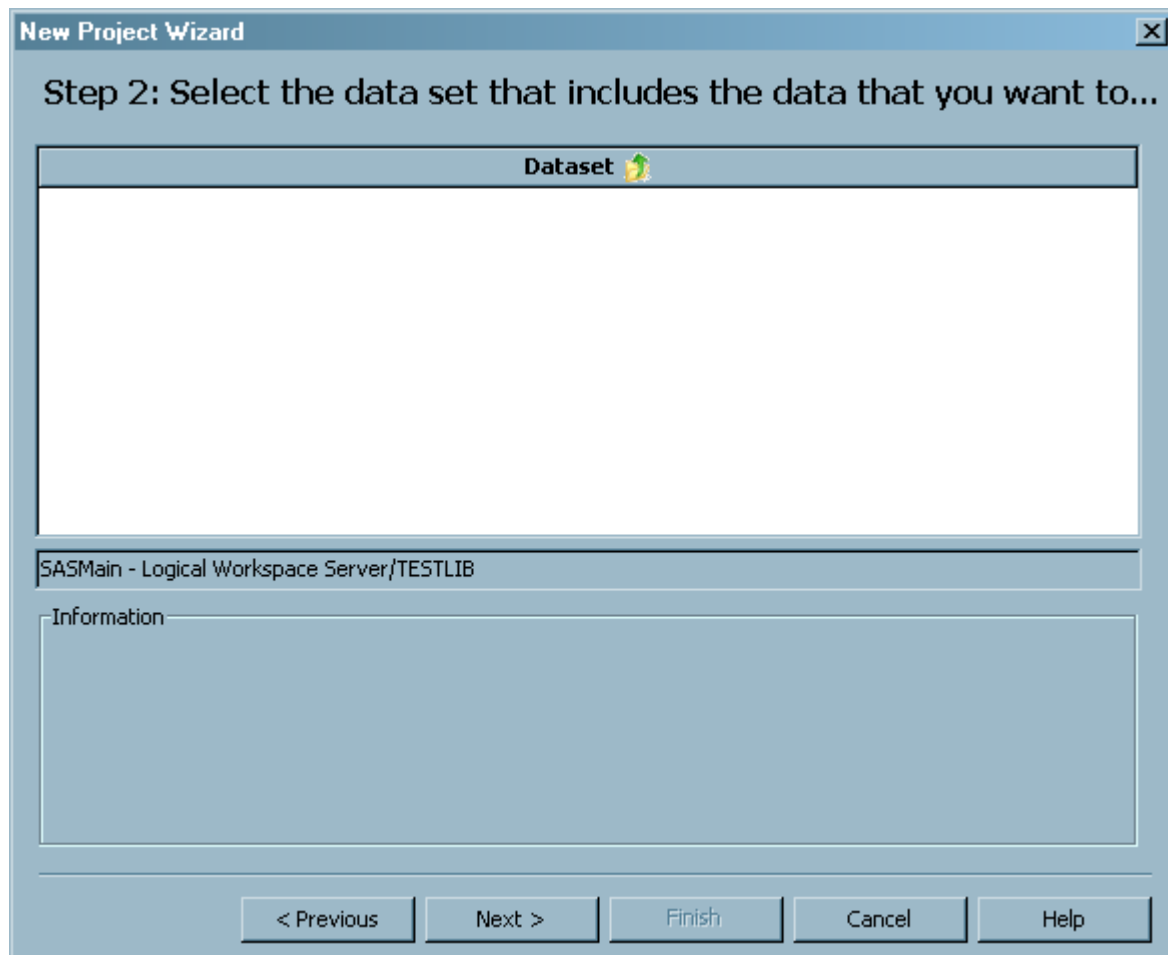
By default, the sasadm user has permissions to read all resources, and the sasdemo user does not have permissions.

Permissions are defined in the SAS Metadata Server, and are maintained through SAS Management Console. If you log on to SAS Management Console as the sasadm user, then you can investigate how permissions are set through the Authorization Manager.

1. Start a SAS Management Console session, and log on as the SAS Administrator (for example, sasadm).

2. Expand the **Authorization Manager** node.

3. Select the **Access Control Templates** node as shown in Figure 12.6.

Figure 12.6 SAS Management Console Authorization Manager
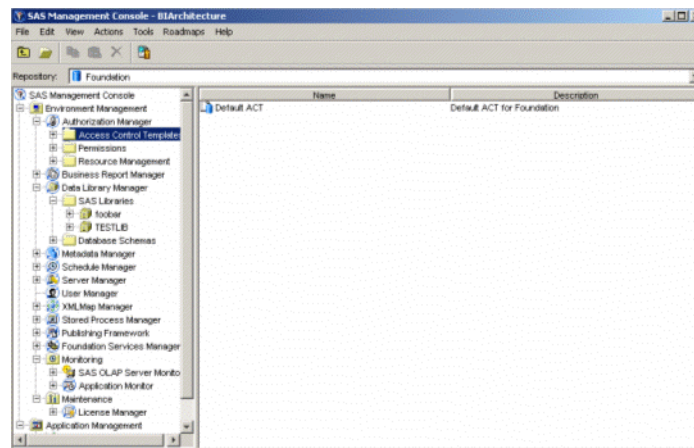
4. Right-click **Default ACT** and select **Properties**, which enables you to modify the default template for the various SAS users.

5. Select the **Authorization** tab, which controls the permissions for the various users and groups as shown in Figure 12.7.

Figure 12.7 Default Act Properties
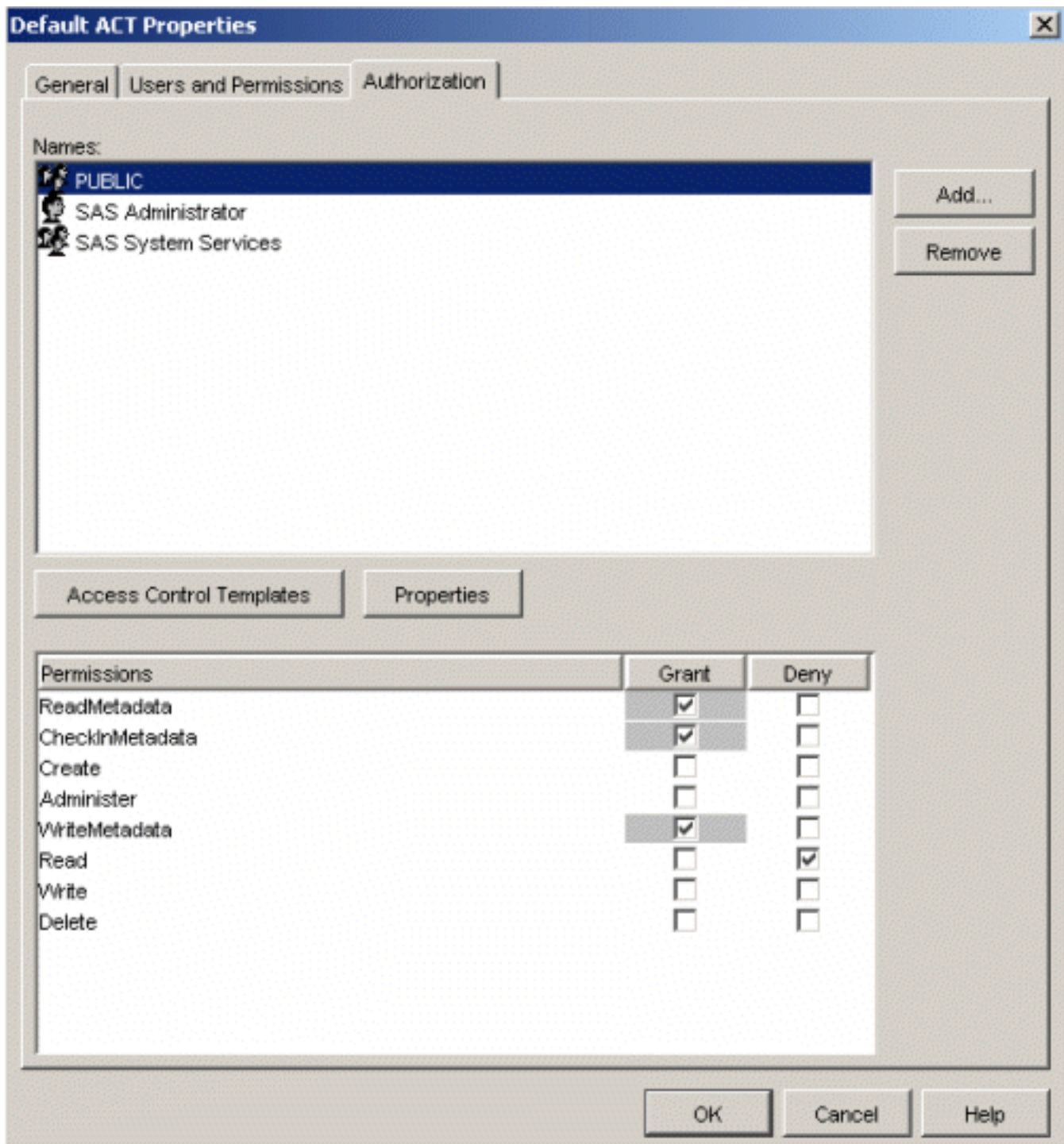
The sasdemo user is a member of the PUBLIC group. The Read permissions for this group are denied. If you click on the SAS Administrator, then you see that the Read permissions are granted. The sasadm user can view all of the SAS data sets in the TESTLIB library, and the sasdemo user cannot view the SAS data sets. SAS Forecast Server filters out any SAS data sets that the user is not authorized to read.

Grant User Permissions to Specific SAS Data Sets

For a more secure deployment, you can secure SAS data sets at a user level. Typically, security is set at the library level. For standard security, see "Pre-assign Libraries in SAS Management Console" on page 79. You can grant Read permissions to a group or user in two ways:

- grant Read permissions to all resources

- grant Read permissions to specific data sets or variables

In the example, you can grant the PUBLIC group Read permissions in the Default Access Control template, but this would open up all the resources. You want to be more specific in granting access. For example, you can grant permissions for sasdemo only to read specific data sets in the TESTLIB library.

1. Start a SAS Management Console session, and log on as the SAS Administrator (for example, sasadm).

2. Click the **Data Library Manager** node.

3. Right-click the **SAS Libraries** entry.

4. Select **New Library**. The New Library Wizard appears, as shown in Figure 12.8.

Figure 12.8 New Library Wizard
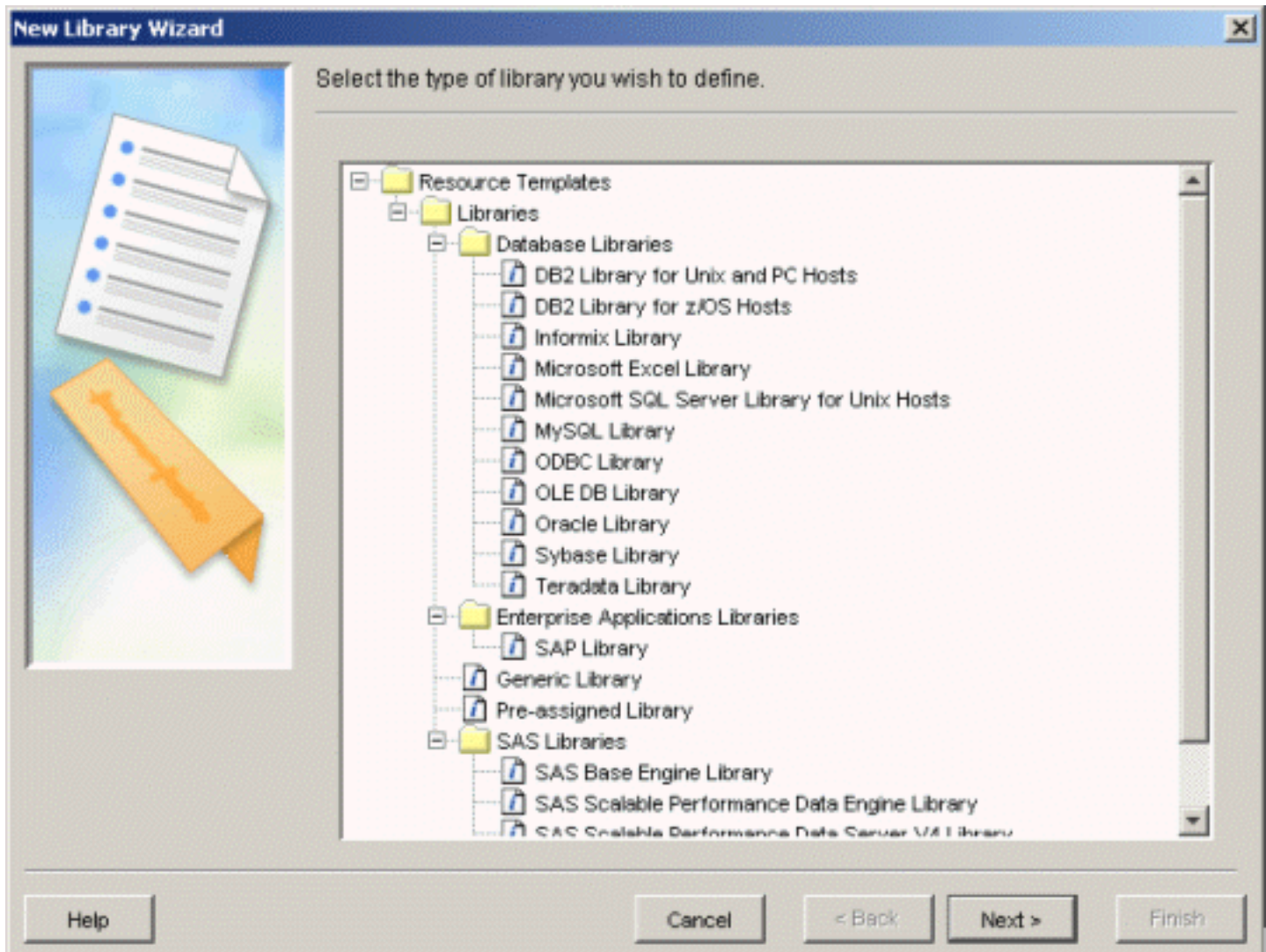
5. Select **SAS Base Engine Library**, and click **Next**.

6. Enter **TESTLIB** for the name, and click **Next**.

7. Enter the following information:

    -   Specify **TESTLIB** as the Libref.
    -   Specify the path that points to the physical location of your data.
    -   Click **Next**.

8. Click to select **SASMain** as the SAS server, and click **Next**.

9. Click **Finish** to return to SAS Management Console.

    NOTE: SAS Forecast Server does not currently use this defined library for the current project because you are defining only a library where you can apply permissions.

10. After the library is defined, expand **SAS Libraries** in SAS Management Console by double-clicking on the **SAS Libraries** entry.

11. Right-click on **TESTLIB** entry, and select **Import Tables**.

12. Click to select **SASMain** as the server, and click **Next**.

13. Optional: If you are prompted for a user ID and password, then enter your user ID and password.

14. Verify the LIBNAME (TESTLIB) and the physical location of the data, and click **Next**. The Define Tables wizard appears as shown in Figure 12.9.

Figure 12.9 Define Tables
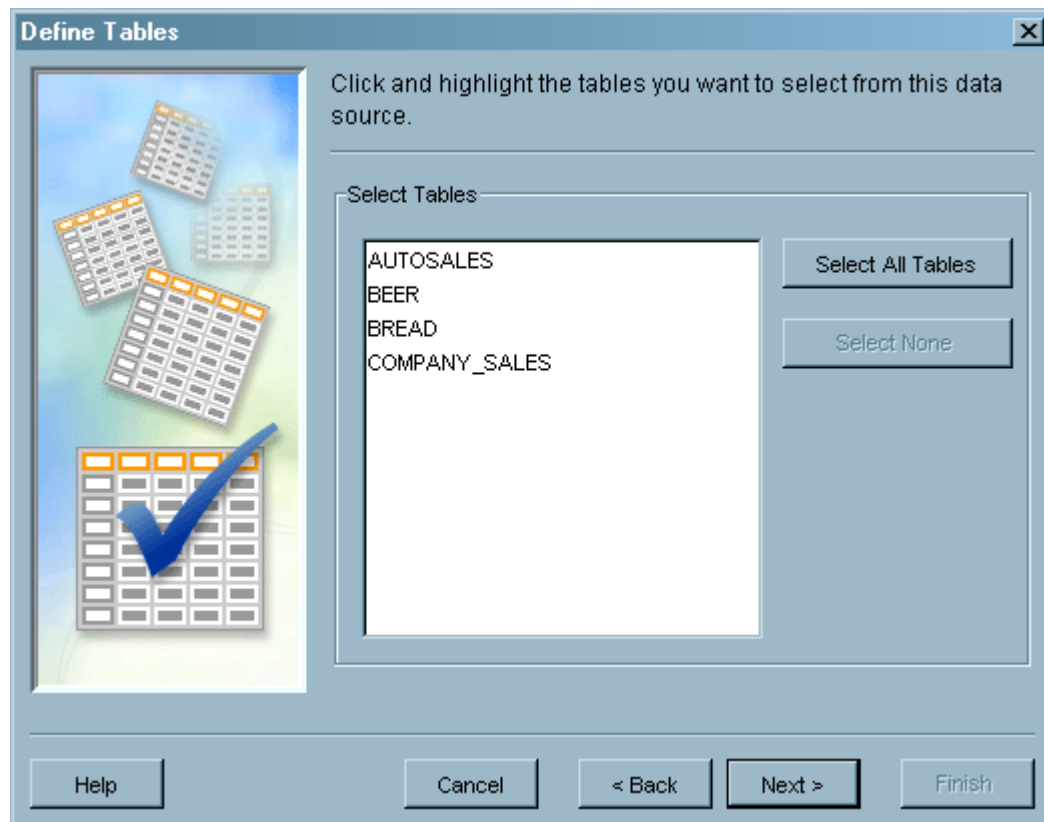
15. Select some data sets and click **Next**. (This example uses the BREAD data set.)

16. Click **Finish**.

You imported the definitions of your data sets into the metadata server. In SAS Management Console, you should see your data sets listed under the TESTLIB library as shown in Figure 12.10.

Figure 12.10 Selecting the BREAD Data Set
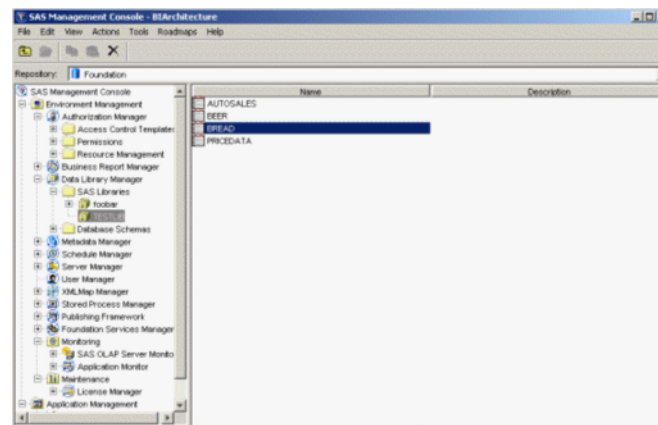
17. Set the permissions for the BREAD data set by performing the following steps:

   a) Right-click the data set, and select **Properties**.

   b) Select the **Authorization** tab as shown in Figure 12.11.

Figure 12.11 Setting Permissions for the BREAD Data Set
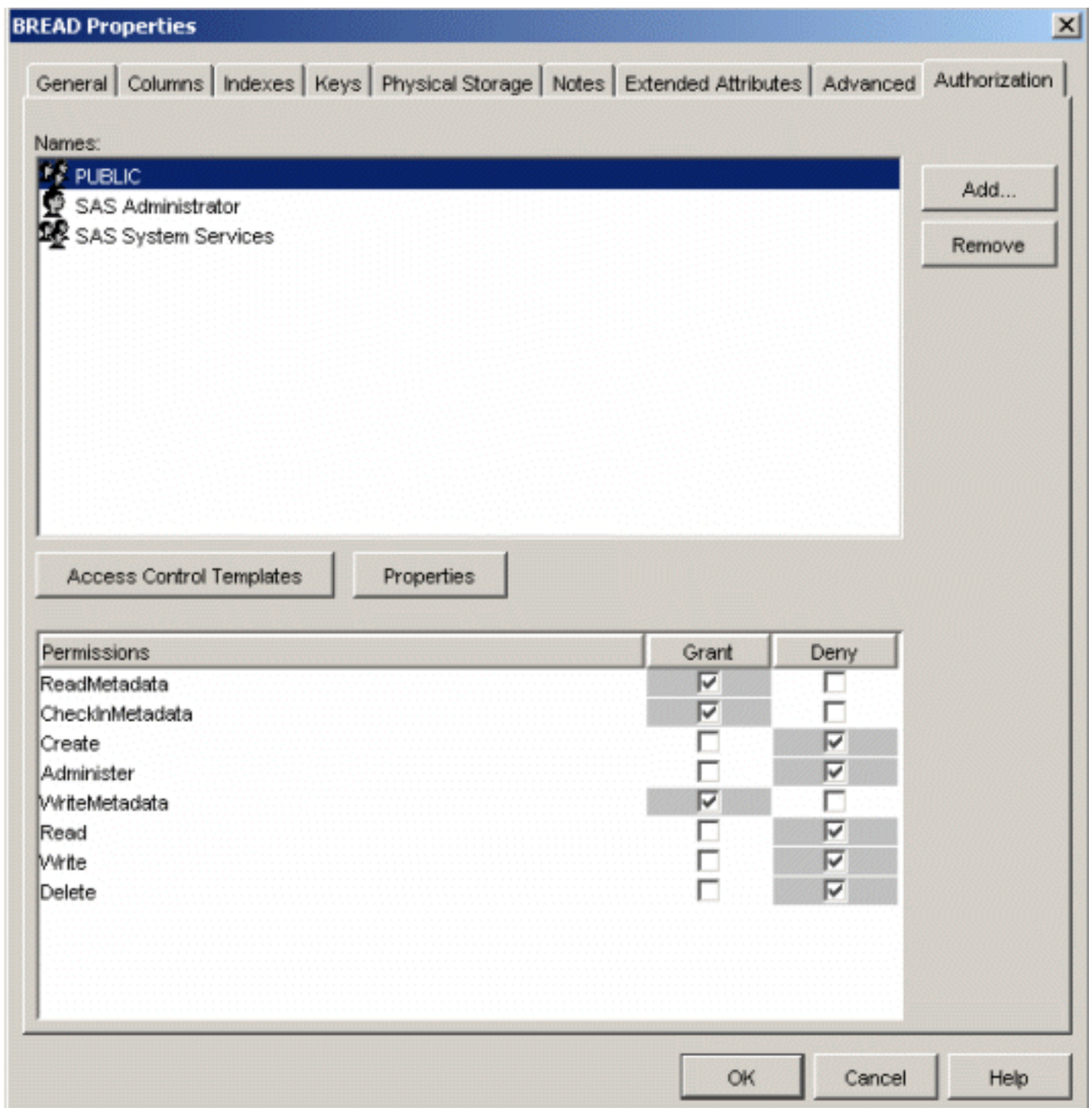
NOTE: The data set inherits the permissions from the Default Access Control template.

c) In order to grant permissions for the PUBLIC group to read the BREAD data set, select the PUBLIC name and check the **Grant** check box for the Read column. The line should become highlighted as shown in Figure 12.12.

Figure 12.12 Setting Permissions for the PUBLIC Group
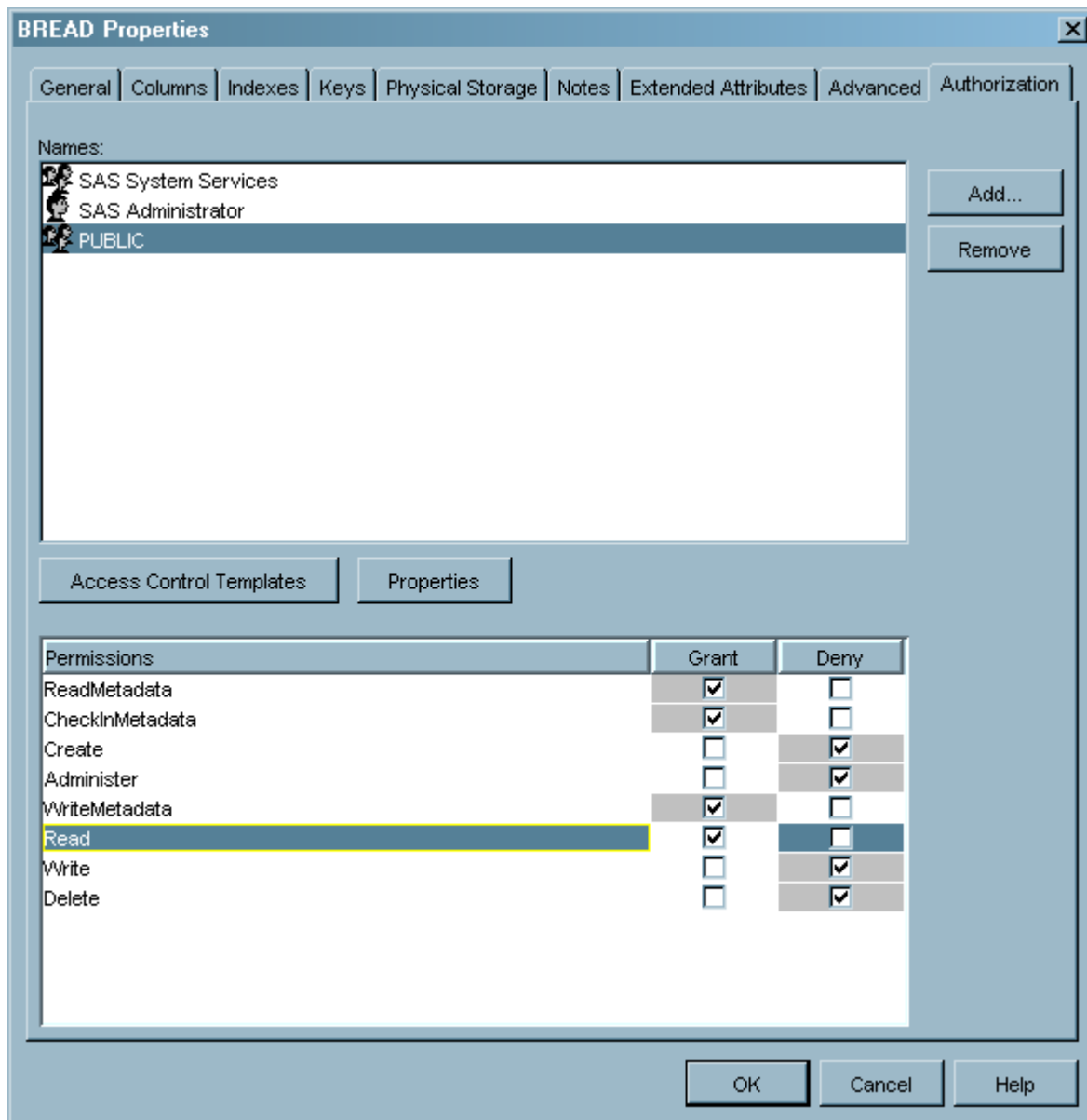
d) Click **OK** to save the changes.

Grant Permissions to All Data Sets in a Library

If you want to grant Read permissions for all of the data sets in the TESTLIB library, then perform the following steps:

1. Start a SAS Management Console session and log on as the SAS Administrator (for example, sasadm).

2. Right-click the **TESTLIB** library and select **Properties**.

3. Repeat the following steps for granting permissions to all of the data sets, similar to how you granted Read permission to the BREAD data set:

   a) Select the **Authorization** tab, select the PUBLIC name, and check the **Grant** check box for the Read column. The line should become highlighted.

   b) Click **OK** to save the changes.

Verify Permissions

In order to verify that the permissions you defined really do exist, perform the following steps:

1. Start the SAS Forecast Studio client, and log on as the sasdemo user.

   NOTE: If you have an existing SAS Forecast Studio client open, then close the session because the client caches data set information.

2. Create a new project by selecting the **TESTLIB** library. You should now be able to see and select the BREAD data set as shown in Figure 12.13.

Figure 12.13 BREAD Data Set Available for Selection
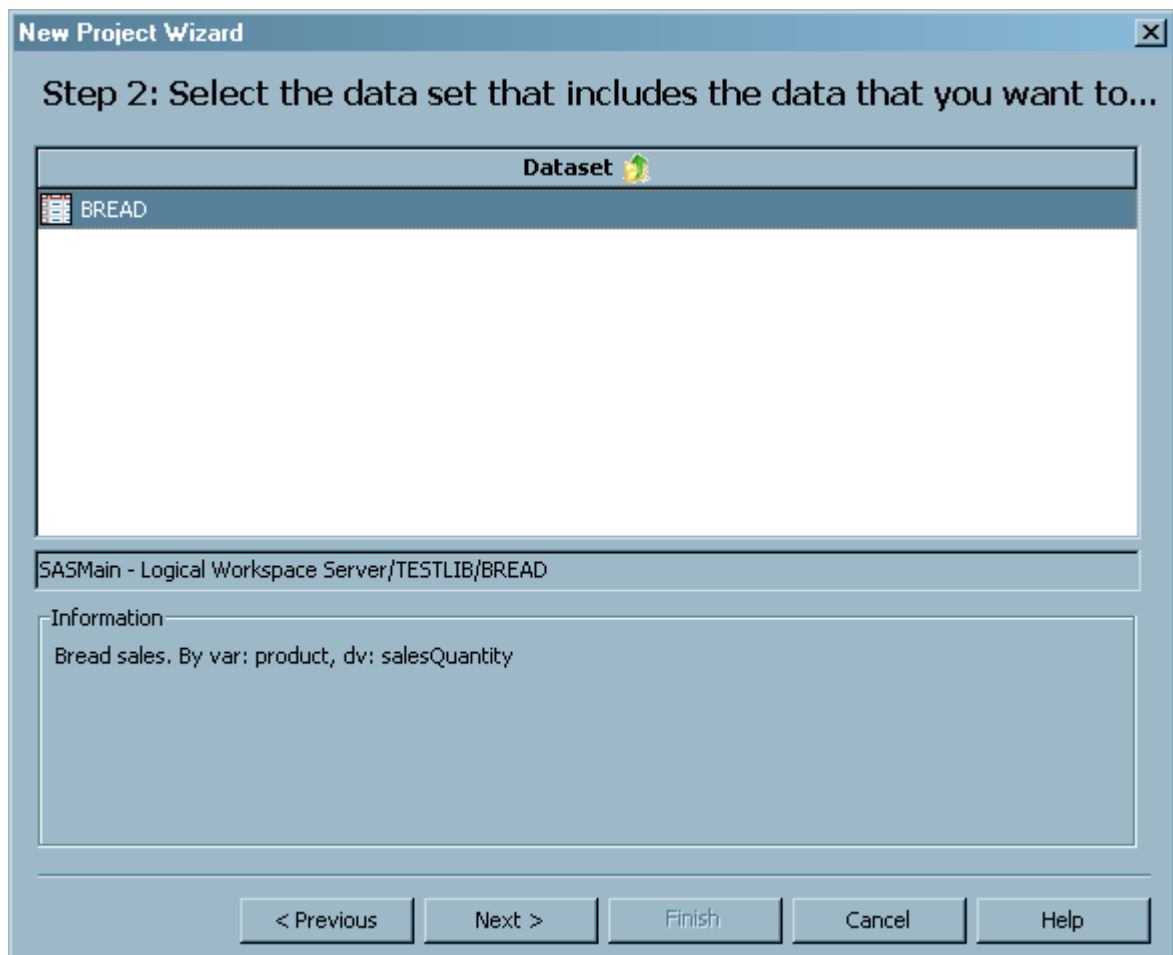
NOTE: By default, the SASHELP, SASUSER, and WORK libraries have Read permissions granted. This is a feature of SAS Forecast Server.

Restrict User Access to Variables

If you want to restrict a user from reading particular variables in a data set, then perform the following steps:

1. Grant Read permissions for the BREAD data set in the SAS Management Console as described in "Grant User Permissions to Specific SAS Data Sets" on page 126

2. Right-click the **BREAD** data set, and select **Properties**.

3. Select the **Columns** tab as shown in Figure 12.14.

Figure 12.14 Setting Variable Permissions
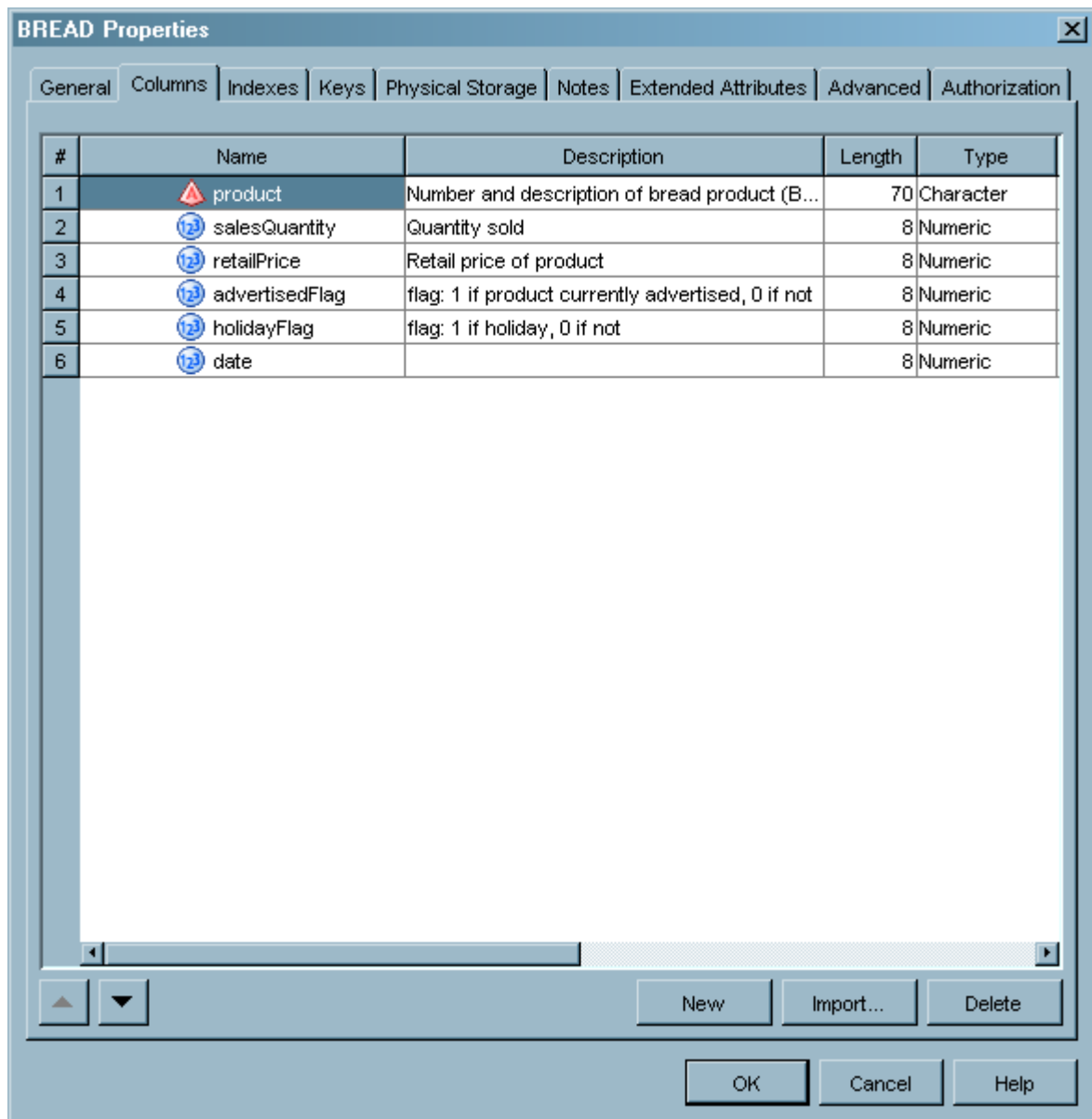
4. To restrict the user from seeing the retailPrice variable, right-click on the **retailPrice** variable.

5. Select the **Authorization** tab, select the PUBLIC name, and check the **Deny** check box for the Read column. The line should become highlighted as shown in Figure 12.15.

6. Click **OK** to exit.

7. Click **OK** to save the changes.

Figure 12.15 Restricted Variable Permissions
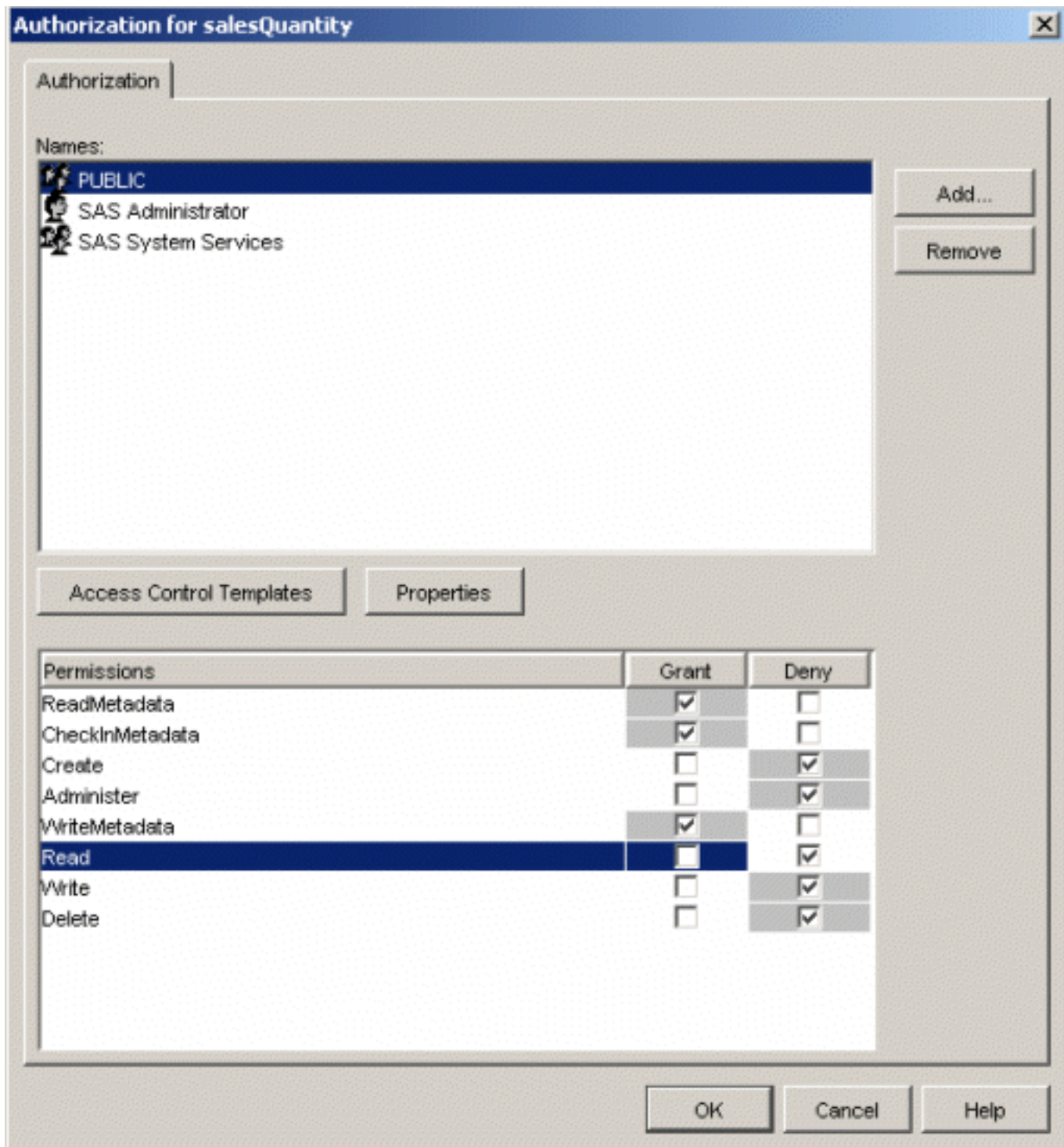
To verify that the sasdemo user does not have permissions to read the retailPrice variable, try to create a new project while logged on as the sasdemo user. Figure 12.16 shows that if you select the TESTLIB library and the BREAD data set, then you are not able to see the retailPrice variable because of the restrictions that you defined on the retailPrice variable. Because you do not have

Read permissions to the retailPrice variable, you cannot use it in your forecasting project.

Figure 12.16 Available Variables Based on Permissions
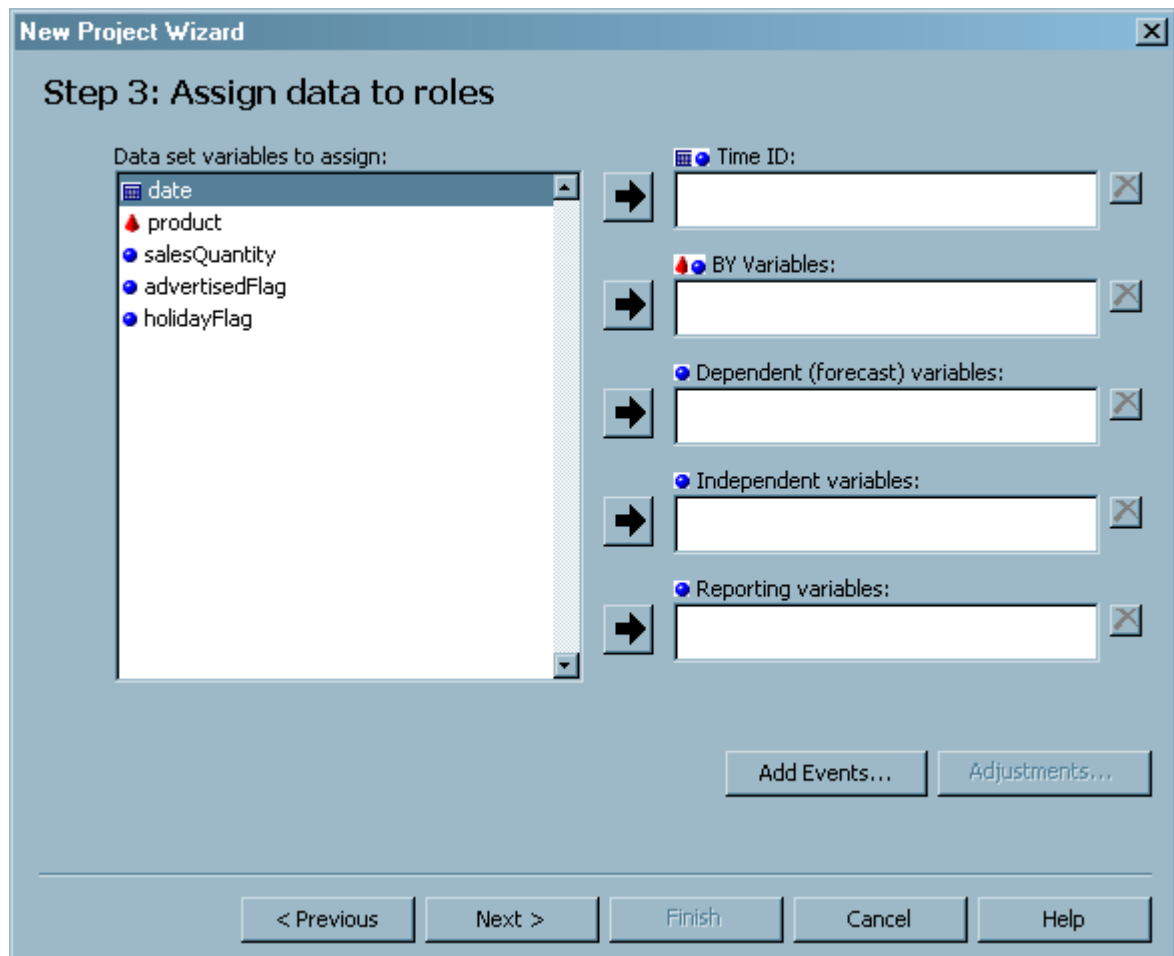
Configure a SAS Forecast Server Report as a Stored Process

What Is a Stored Process?

A stored process is a SAS program that is stored centrally on a server. A client application can then execute the program, and can receive and process the results. Stored processes enable you to maintain and manage code centrally, give you better control over changes, enhance security and application integrity, and ensure that every client executes the latest version of code that is available. Stored processes are like other SAS programs, except that they have an additional feature that enables you to customize the program's execution. This feature enables the invoking application to supply parameters at the time that the stored process is invoked. For example, if you have a stored process that analyzes monthly sales data, you could create a MONTH variable in the stored process. At execution time, you would supply the parameter MONTH=MAY to analyze May sales data. For more information about how to create a stored process and to invoke it in a client application, see the stored process section of the *SAS Integration Technologies: Developer's Guide* at: **http://support.sas.com/documentation**.

Accessing Stored Processes in the SAS Forecast Server

Stored processes consist of two distinct parts: the SAS code and the stored process definition that resides on a metadata server. The SAS Forecast Server supports access to project information through stored processes, generally called *reports*.

You can access and execute reports when you have a project open in SAS Forecast Studio by selecting **Tools** → **Reports and Stored Processes** from the main menu. Figure 12.17 shows an example of the Reports and Stored Processes dialog box in SAS Forecast Studio.

Figure 12.17 SAS Forecast Studio Reports and Stored Processes Dialog Box
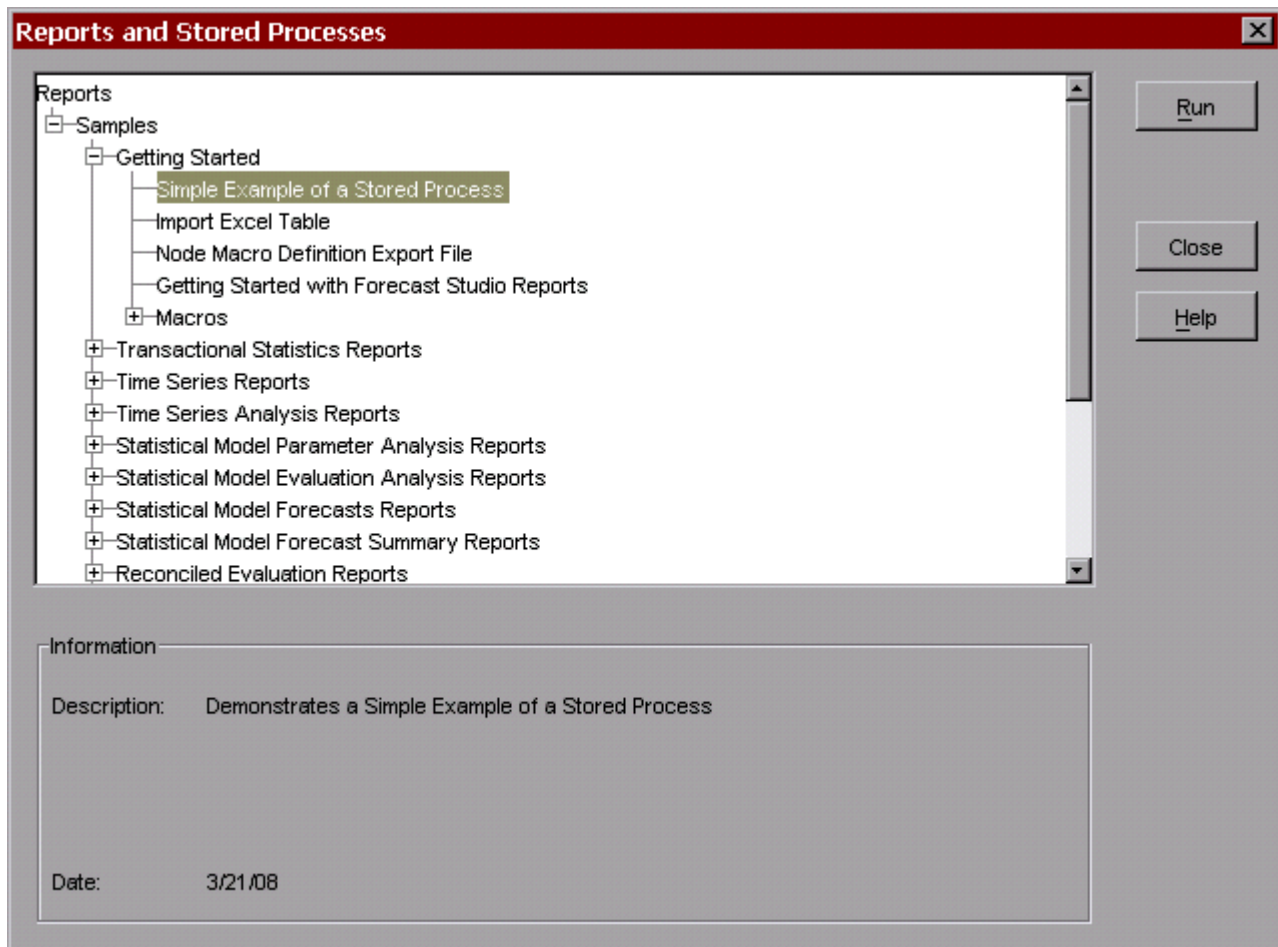
When you execute a report from within SAS Forecast Studio, the data and forecasts from the current project are passed to the stored process. For more information about the macro variables that are passed to the stored process, see Predefined Macro Variables to Use with Stored Processes.

Registering Custom Reports

This section explains the preregistration tasks and the process for registering your reports for use in SAS Forecast Studio. This documentation assumes that you are familiar with the basic processes and terminology that are related to using stored processes in the SAS BI Server. For information

about stored processes, see the *SAS Integration Technologies: Developer's Guide* at
http://support.sas.com/documentation.

NOTE: Before you configure any of the stored processes, it is recommended that you make a copy
of the stored process metadata object and its associated source code file.

Preregistration Tasks

Before you register a custom report in SAS Management Console, complete the preregistration
tasks in this section. These planning tasks enable you to gather the information that you need to
register a report using SAS Management Console. For more information, see Register the Report
with SAS Management Console.

To prepare for report registration:

1. Locate the source code for the report in the file system and its source filename. For example,
   suppose that you want to display a new report in SAS Forecast Studio that you have saved as
   example.sas in the **C:\MyStoredProcesses** folder in your file system. The source
   repository location is **C:\MyStoredProcesses**, and the source filename is **example.
   sas**. Note that this file system location must be on the same physical machine that hosts the
   corresponding project files for the SAS Forecast Server. This ensures that the project data is
   accessible to the stored process when it executes.

2. Plan the organization of your report hierarchy. If you want to display the report under its own
   folder group in the Reports and Stored Processes dialog box in SAS Forecast Studio, then
   you can specify this hierarchy in SAS Management Console. For example, you can specify
   that a **My Reports** folder displays in the Reports and Stored Processes dialog box under the
   Reports tree. Figure 12.18 shows an example of a custom folder structure that uses the **My
   Reports** subfolder.

Figure 12.18 Example Report Hierarchy
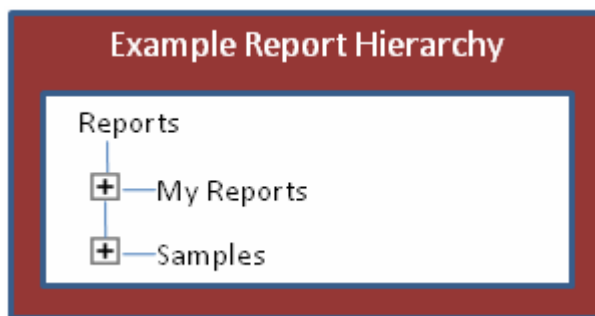
For more information about creating metadata folders, see the documentation for SAS Man-
agement Console at **http://support.sas.com/documentation**.

3. Select a name for the report. The report name that you specify in SAS Management Console
   is the metadata object name. This report name displays in the Reports and Stored Processes
   dialog box in SAS Forecast Studio. For example, if you name the report **My Example Report**
   in SAS Management Console, then the Reports and Stored Processes dialog box displays the

name, **My Example Report**. Figure 12.19 shows an example folder structure that uses the **My Reports** subfolder that contains the **My Example Report**.

Figure 12.19 Example Report Hierarchy with an Example Report
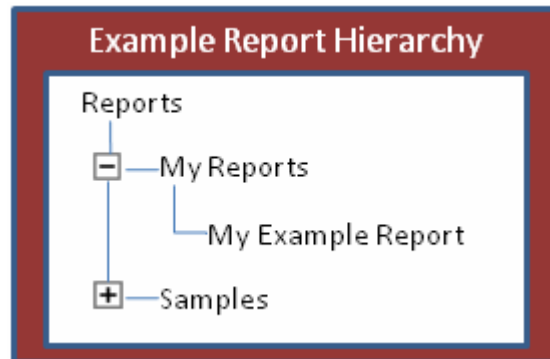
Register the Report with SAS Management Console

To complete the definition of a custom report for use in the SAS Forecast Server, you must register the report (stored process) by creating a stored process metadata object.

To register the report in SAS Management Console:

1. Open SAS Management Console and connect to a metadata repository as an administrator (for example, sasadm).

2. Expand the **Environment Manager > BI Manager** folder.

3. Expand the **Forecast Studio** folder.

4. Right-click the **Stored Processes** folder, and then select **New Folder**. Name the new metadata folder **My Reports**.

   NOTE: When you create folders in SAS Management Console to organize the report hierarchy, you must create the folders under the **Stored Processes** folder. The root **Reports** node in the Reports and Stored Process dialog box in SAS Forecast Studio corresponds to the **Stored Processes** metadata folder. Therefore, any stored processes that you configure in this folder, or in a descendant folder, appear in the Reports and Stored Processes dialog box. The folder structure that you create under the **Stored Processes** folder is mirrored in the Reports and Stored Processes dialog box.

5. Right-click the **My Reports** folder, and then select **New Stored Process**.

6. Enter the name of your SAS program, **My Example Report**, and an optional description. Click **Next**.

7. Set the **SAS Server** option to the SAS Workspace Server that hosts the project files.

   NOTE: It is important that the execution server for the stored process is set to the SAS Workspace Server that hosts the projects that use this report. It is equally important that the .sas source file for the stored process is located in the file system of this same server.

8. Select the directory where you saved your SAS code (in this example, `C:\MyStoredProcesses`) as the source code repository. If your directory does not appear in the list of options, complete these steps:

    a) Click **Manage**.

    b) Click **Add**.

    c) Enter `C:\MyStoredProcesses` as the location and an optional description.

    d) Click **OK**.

    e) Click **OK** again.

9. Complete the remaining fields by entering the name of your SAS program, **example.sas**, as the source file, and then selecting **Transient package** as the output type. Click **Next**.

10. Click **Finish** in the Parameter panel.

NOTE: Defining parameters is beyond the scope of this example. For more information about how to create a stored process, see the stored process section of the *SAS Integration Technologies: Developer's Guide* at **http://support.sas.com/documentation**.

Report Execution Constraints

While working with custom reports in the SAS Forecast Server, note these constraints:

- The SAS Forecast Server does not currently support the execution of reports using a SAS Stored Process Server.

- Each metadata object is configured to use a single execution server. When you use multiple SAS Workspace Servers to host projects, it is recommended that you create one metadata object per SAS Workspace Server. You must store the source file for the stored process in the file system for each SAS Workspace Server so each metadata object can refer to the source file that is located in its file system.

- In the Reports and Stored Processes dialog box, SAS Forecast Studio lists all of the available reports. You can execute only reports that use the same SAS Workspace Server as the project. If the stored process and the project are not on the same SAS Workspace Server, then the stored process cannot access the project data.

Predefined Macro Variables to Use with Stored Processes

To assist you with creating stored processes, SAS provides predefined macro variables. These macro variables contain information about the project as well as the location in the hierarchy that you are viewing currently. In general, the predefined macro variables that are used by SAS Forecast Server can be grouped into two categories:

- project macro variables

- interactive macro variables

You can use the project macro variables outside of SAS Forecast Server in SAS programs and stored processes by including the &HPF_INCLUDE file. You cannot use interactive macro variables outside of SAS Forecast Server in SAS programs and stored processes unless you define these macro variables yourself.

Interactive macro variables depend on the node of the tree (table) that currently is selected. Project macro variables do not depend on the tree node.

NOTE: If the number of variables is very large (BY, dependent, independent, reporting, and so on), the stored process macro variables can exceed the default maximum macro variable value length of 4096. The maximum length can be increased to 65534 by using the MVARSIZE= system option.

Table 12.2 lists the macro variables and their descriptions. You can use these macro variables in any stored process which you create for a SAS Forecast Server project.

Table 12.2 Pre-defined Macro Variables

Name	Description	Format
Macro Variables for Project Information		
HPF_DESC	Description of the Forecast Studio Project.	SAS label
HPF_PROJECT	The name of the project.	SAS name
HPF_PROJECT_LOCATION	System path to the project directory or folder.	System path
HPF_PROJECT_SERVER	SAS Workspace Server name.	Host name
HPF_INCLUDE	Project include file. This macro variable specifies the system path and filename that contains the SAS code to assign SAS libraries and catalogs associated with the project. By default, all libraries and catalogs are assigned with Read Only access (ACCESS=READONLY). For example, the following SAS code assigns project library names with Read Only access: %include "&HPF_INCLUDE"; For example, the following SAS code assigns project library names with Read and Write access: %let HPF_READ_ONLY = 0; %include "&HPF_INCLUDE";	System filename
Macro Variables for Project Input Data Information		
HPF_INPUT_LIBNAME	SAS library reference for the input data set.	SAS name
HPF_INPUT_DATASET	SAS member for the input data set.	SAS name
Macro Variables for Project Variable Information		
HPF_NUM_BYVARS	Number of BY variables. If there are no BY variables, HPF_NUM_BYVARS is set to zero.	Nonnegative integer

Table 12.2 Pre-defined Macro Variables (continued)

Name	Description	Format
HPF_BYVARS	List of BY variable names. The order of the BY variable names is the same as specified in the project. The macro variable is always defined; but if there are no BY variables, HPF_BYVARS is set to NULL.	List of SAS names separated by a single space
HPF_BYVAR&n	BY variable name listed in the nth position of the ordered list of BY variables (HPF_BYVARS). The first BY variable name is stored in HPF_BYVAR1, the second in HPF_BYVAR2, and the last is stored in HPF_BYVAR&HPF_NUM_BYVARS. If there are no BY variables (&HPF_NUM_BYVARS is zero), these macro variables are not defined.	SAS name
HPF_NUM_DEPVARS	Number of dependent variables. There is always at least one dependent variable.	Positive integer
HPF_DEPVARS	List of all dependent variable names. The order of the dependent variable names is the same as specified in the project.	List of SAS names separated by a single space
HPF_DEPVAR&n	Dependent variable name listed in the nth position of the ordered list of dependent variables (HPF_DEPVARS). The first dependent variable name is stored in HPF_DEPVAR1, the second in HPF_DEPVAR2, and the last is stored in HPF_DEPVAR&HPF_NUM_DEPVARS. Since there is always at least one dependent variable associated with a project, HPF_DEPVAR1 is always defined.	SAS name
HPF_NUM_INDEPVARS	Number of independent variables. If there are no independent variables, HPF_NUM_INDEPVARS is set to zero.	Nonnegative integer
HPF_INDEPVARS	List of all independent variable names. The order of the independent variable names is the same as specified in the project. The macro variable is always defined; but if there are no independent variables, HPF_INDVARS is set to NULL.	List of SAS names separated by a single space

Table 12.2 Pre-defined Macro Variables (continued)

Name	Description	Format
HPF_INDEPVAR&n	Independent variable name listed in the nth position of the ordered list of independent variables (HPF_INDEPVARS). The first independent variable name is stored in HPF_INDEPVAR1, the second in HPF_INDEPVAR2, and the last is stored in HPF_INDEPVAR&HPF_NUM_INDEPVARS. If there are no independent variables (&HPF_NUM_INDVARS is zero), these macro variables are not defined.	SAS name
HPF_NUM_REPORTVARS	Number of reporting variables. If there are no reporting variables, then HPF_NUM_REPORTVARS is set to zero.	Nonnegative integer
HPF_REPORTVARS	List of all reporting variable names. The order of the reporting variable names is the same order as specified in the project. The macro variable is always defined; but if there are no reporting variables, then HPF_REPORTVARS is set to NULL.	List of SAS names separated by a single space
HPF_REPORTVAR&n	Report variable name listed in the nth position of the ordered list of report variables (HPF_REPORTVARS). The first report variable name is stored in HPF_REPORTVAR1, the second in HPF_REPORTVAR2, and the last is stored in HPF_REPORTVAR&HPF_NUM_REPORTVARS. If there are no reporting variables (&HPF_NUM_REPORTVARS is zero), then these macro variables are not defined.	SAS name
Macro Variables for Project Time ID Information		
HPF_TIMEID	Time ID variable name	SAS name
HPF_TIMEID_FORMAT	Time ID format name	SAS format name
HPF_SEASONALITY	Length of the seasonal cycle A seasonality of 1 implies no seasonality.	Positive integer
HPF_INTERVAL	Time interval name	SAS time interval

Table 12.2 Pre-defined Macro Variables (continued)

Name	Description	Format
HPF_DATASTART	Start date/date-time/time value of the project The starting time ID value of the project input data set (&HPF_LIBNAME.&HPF_DATASET).	SAS date/ date-time/ time value
HPF_DATAEND	End date/date-time/time value of the project The ending time ID value of the project input data set (&HPF_LIBNAME..&HPF_DATASET).	SAS date/ date-time/ time value
Macro Variables for Project Data Options		
HPF_SETMISSING	Missing value interpretation	
HPF_TRIMMISS	Missing value trimming	
HPF_ZEROMISS	Zero value interpretation	
Macro Variables for Project Diagnostic Options		
HPF_DIAGNOSE_INTERMITTENT	Intermittency threshold value	Positive number
HPF_DIAGNOSE_SEASONTEST	Seasonality significance level	P-value
Macro Variables for Project Selection Options		
HPF_SELECT_CRITERION	Model selection criterion	
HPF_SELECT_HOLDOUT	Holdout sample absolute size Zero implies that the model fit is used for selection.	
HPF_SELECT_HOLDOUTPCT	Holdout sample percent size	Positive integer
HPF_SELECT_MINOBS_NON_MEAN	Minimum number of observations required before a non-mean model is selected	Positive integer
HPF_SELECT_MINOBS_TREND	Minimum number of observations required before a trend model is selected	Positive integer
Macro Variables for Project Forecast Options		
HPF_LEAD	Length of the forecast horizon or lead	Nonnegative integer
HPF_BACK	Number of time periods to omit	Positive integer
HPF_FORECAST_ALPHA	Confidence level size	P-value
Macro Variables for Project Hierarchy Information		
HPF_NUM_LEVELS	Number of levels in the hierarchy The levels of the hierarchy are numbered from 1 (the top of the hierarchy) to &HPF_NUM_LEVELS (the leaves of the hierarchy). If there is no hierarchy, then the number of levels is 1.	Positive integer

Table 12.2 Pre-defined Macro Variables (continued)

Name	Description	Format
HPF_LEVEL_DATAWHERE&n	Input data WHERE clause for the nth level, where *n* ranges from 1 to &HPF_NUM_LEVELS These WHERE clauses can be used to subset the input data sets for each level in the hierarchy to obtain information about the currently selected node. The WHERE clause at level 1 (the top) is stored in HPF_LEVEL_DATAWHERE1, the WHERE clause at the lowest level (the leaves) is stored in HPF_LEVEL_DATAWHERE&HPF_NUM_LEVELS. **NOTE:** You must unquote this macro variable. For example, %unquote (&&HPF_CURRENT_DATAWHERE&n);	SAS WHERE clause
HPF_LEVEL_OUTWHERE&n	Output data WHERE clause for the nth level where n ranges from 1 to &HPF_NUM_LEVELS These WHERE clauses can be used to subset the input data sets for each level in the hierarchy to obtain information about the currently selected node. The WHERE clause at level 1 (the top) is stored in HPF_LEVEL_OUTWHERE1, the WHERE clause at the lowest level (the leaves) is stored in HPF_LEVEL_OUTWHERE&HPF_NUM_LEVELS. **NOTE:** You must unquote this macro variable. For example, %unquote (&&HPF_LEVEL_OUTWHERE&n);	SAS WHERE clause
HPF_LEVEL_RECONCILE_DATASET&n	Reconciled forecast data set for the nth level	SAS name
HPF_LEVEL_RECONCILE_STATISTICS&n	Reconciled statistics data set for the nth level	SAS name
HPF_LEVEL_RECONCILE_SUMMARY&n	Reconciled summary data set for the nth level	SAS name

Table 12.2 Pre-defined Macro Variables (continued)

Name	Description	Format
HPF_LEVEL_BYVARS&n	List of BY variable names associated with the nth level, where *n* ranges from 1 to &HPF_NUM_LEVELS The variables names are separated by a single space. The BY variables at level 1 (the top) are stored in HPF_LEVEL_BYVARS1, the BY variables for the lowest level (the leaves) are stored in HPF_LEVEL_BYVARS&HPF_NUM_LEVELS.	SAS name
HPF_LEVEL_LIBNAME&n	SAS library reference for the nth level, where *n* ranges from 1 to &HPF_NUM_LEVELS The library reference at level 1 (the top) is stored in HPF_LEVEL_LIBNAME1, the library reference at the lowest level (the leaves) is stored in HPF_LEVEL_LIBNAME&HPF_NUM_LEVELS.	SAS LIBNAME
HPF_LEVEL_NSERIES&n	Number of series associated with the nth level, where *n* ranges from 1 to &HPF_NUM_LEVELS The number of series at level 1 (the top) is stored in HPF_LEVEL_NSERIES1, the number of series at the lowest level (the leaves) is stored in HPF_LEVEL_NSERIES&HPF_NUM_LEVELS.	Positive integer
Macro Variables for Project Event Information		
HPF_EVENTS	List of all event names	SAS name
HPF_EVENT_n	Name of the nth event	SAS name
HPF_NUM_EVENTS	Number of events	Positive integer
Macro Variables for Project Reconcile Information		
HPF_RECONCILE_LEVEL	Number of the reconciliation level The reconciliation level number ranges from 1 to &HPF_NUM_LEVELS, depending on the level of reconciliation.	Positive integer
HPF_RECONCILE_BYVAR	BY variable of reconciliation level	SAS name
HPF_RECONCILE_METHOD	Reconciliation method	SAS name
Macro Variables for Interactive Current Level Information		

Table 12.2 Pre-defined Macro Variables (continued)

Name	Description	Format
HPF_CURRENT_LEVEL	The level number associated with the current level. The current level number ranges from 1 to &HPF_NUM_LEVELS, depending on the currently selected level of the hierarchy.	Positive integer
HPF_CURRENT_LIBNAME	SAS library reference for the currently selected level of the hierarchy	SAS LIBNAME
HPF_CURRENT_LEVEL_ START	Start date/date-time/time value of the current level The starting time ID value of the input data set for the currently selected level of the hierarchy.	SAS date/ date-time/ time value
HPF_CURRENT_LEVEL_END	End date/date-time/time value of the current level The ending time ID value of the input data set for the currently selected level of the hierarchy.	SAS date/ date-time/ time value
HPF_CURRENT_LEVEL_NSERIES	Number of series (or nodes) associated with the currently selected level of the hierarchy	Positive integer
HPF_CURRENT_DATAWHERE	Input data WHERE clause for the currently selected node This WHERE clause can be used to subset the input data set to obtain information about the currently selected node of the hierarchy. **NOTE:** You must unquote this macro variable. For example, %unquote (&HPF_CURRENT_DATAWHERE);	SAS WHERE clause
HPF_CURRENT_OUTWHERE	Output data WHERE clause for the currently selected node This WHERE clause can be used to subset the output data sets to obtain information about the currently selected node. **NOTE:** You must unquote this macro variable. For example, %unquote (&HPF_CURRENT_OUTWHERE);	SAS WHERE clause
HPF_NUM_CURRENT_BYVARS	Number of BY variable names for the currently selected level of the hierarchy	Nonnegative integer

Table 12.2 Pre-defined Macro Variables (continued)

Name	Description	Format
HPF_CURRENT_BYVARS	List of BY variable names for the currently selected level of the hierarchy The macro variable is always defined; but if there are no BY variables, HPF_CURRENT_BYVARS is set to NULL.	List of SAS names separated by a single space
HPF_CURRENT_BYVARS&n	n^{th} BY variable name for the current level	SAS name
HPF_CURRENT_DEPVAR	Dependent variable name associated with the currently selected node of the hierarchy. This variable is contained in the list of dependent variables (HPF_DEPVARS).	SAS name
HPF_CURRENT_SERIESSTART	Start date/date-time/time value of the current node The starting time ID value of the series for the currently selected node of the hierarchy.	SAS date/ date-time/ time value
HPF_CURRENT_SERIESEND	End date/date-time/time value of the current node The ending time ID value of the series for the currently selected node of the hierarchy.	SAS date/ date-time/ time value
HPF_CURRENT_HORIZON	Horizon date/date-time/time value of the current node The time ID value of the start of the multi-step ahead forecast for the currently selected node of the hierarchy.	SAS date/ date-time/ time value
Macro Variables for Metadata Repository Information		
HPF_METADATA_HOST	Metadata server host name	Host name
HPF_METADATA_PORT	Metadata server port number	Port number
HPF_METADATA_REPNAME	Metadata repository name	Repository name
Macro Variables for Other Information		
HPF_READ_ONLY	Project access Read Only flag By default, stored processes have Read Only access with respect to the project libraries. This macro variable changes this access to Write. For example, the following SAS code assigns project library names with Read Only access: %include "&HPF_INCLUDE"; For example, the following SAS code assigns project library names with Write access: %let HPF_READ_ONLY = 0; %include "&HPF_INCLUDE";	Boolean

Table 12.2 Pre-defined Macro Variables (continued)

Name	Description	Format
HPF_DEFAULT_LOCATION	Default path to the system directory where the SAS Forecast Server projects are currently stored	System pathname
HPF_ODSDEST	Used inside a stored process to control the output destination of ODS By default, HPF_ODSDEST is set to HTML, which means that the ODS output is in HTML format. You can change this value by adding a stored process parameter with the macro variable name of HPF_ODSDEST, which provides a choice at runtime. The valid values are the following: HTML (default) PDF RTF XML	ODS destinations

Use a Customized Format in SAS Forecast Server

To use a customized format that you defined with the data set in SAS as well as in SAS Forecast Server, you must make the user-written format accessible to the SAS Workspace Server. You can accomplish this by using one of the following methods:

- You can store the user-written format in the default formats catalog location:
  ```
  <config-dir>/Lev1/SASMain/SASEnvironment/SASFormats
  ```

- You can modify the SAS configuration file to search for your customized format in its own library as well as search the default formats library.

To use a customized format, perform the following steps:

1. Verify that the format matches the data values. For example, the following format statement needs to contain line names with a capitalized L (Line1, Line2, and so on).
   ```
   value $ line
   Line1='Product Line1'
   Line2='Product Line2'
   Line3='Product Line3'
   Line4='Product Line4'
   Line5='Product Line5';
   ```

2. The format must be stored in a persistent format library that is accessible to SAS. This requires that you use the LIBRARY= option with the PROC FORMAT statement.

   To store the format in the default location, the SAS code is written as follows:

```
libname library
 "<config-dir>/Lev1/SASMain/SASEnvironment/SASFormats;
 proc format library=library;
```

...

If you want to store the user-defined formats in the **C:\myfmts** location on the SAS server, then the SAS code is written as follows:

```
libname library "c:\myfmts";
 proc format library=library;
```

...

The catalog name in this library defaults to formats.

3. The format library must be defined to the SAS Workspace Server session that is used by SAS Forecast Server. If the customized format is stored in the default location, then no further modifications are required. If the customized format is in a different location, then you must configure SAS to search that library in addition to the default library.

   To search a different format library, you edit the configuration file that can be found in the following default location:

   Windows:
   C:\SAS\Forecast\Lev1\SASMain\sasv9.cfg

   UNIX:
   <config-dir>/Lev1/SASMain/sasv9.cfg

   Add the library definition, and include the library definition in the format-search parameter:

   ```
   -set FSFMTS ("c:\myfmts")
   -fmtsearch (FSFMTS)
   ```

   When the SAS Workspace Server is restarted, the system resolves references to the customized formats that are stored in the formats catalog in **C:\myfmts**.

Middle Tier

Change the Location Where User Projects Are Saved

The current user interface does not support a project location to be specified. The only location known to the system is stored in the metadata, and the user cannot customize this location either in the user interface or in the metadata.

However, an optional file can be created to define a mapping for users and the default SAS workspace server location where projects, data specifications, and archives are created. The

user_locations.properties file must reside on the SAS Analytics Platform Server middle tier in the following directory (Windows operating environment example):

!SASROOT\SASAPCore\apps\Forecasting

The user_locations.properties file contains the workspace server locations by user ID, or by user ID and workspace session ID. SAS Forecast Server uses this mapping file to determine where workspace server project files should be saved physically. SAS Forecast Server first attempts to find the user ID and SAS workspace server ID entries, and if it does not find them, then attempts to find just the user ID. If neither ID is found, then the default location in the metadata is used. The user ID and SAS Workspace Server ID entries are case insensitive, as shown in the following Window operating environment examples:

myuser=C:\SAS\ForecastStudio

myuser\A5PITA0F.AT000001=D:\myuser\ForecastStudio

brenda=c:\users\brenda\ForecastStudio

mike=c:\users\mike\ForecastStudio

george=c:\users\george\ForecastStudio

brian=\\myserver\myprojects (UNC pathname example)

The user_locations.properties file is read dynamically, and can be modified while the SAS Analytics Platform Server is running. Changes are reflected without having to restart the SAS Analytics Platform Server.

A mapped drive letter such as **U:\<foldername>** is not supported. Given that this directory path is resolved by the SAS Workspace Server, the logon script for that user is NOT executed when a SAS Workspace Server starts. As a result, a drive letter that would be mapped automatically in a logon script would never be defined.

Windows Operating System

Change the SAS Analytics Platform Server Default Port for Forecasting from within SAS Add-in for Microsoft Office

The SAS Forecast Studio Web service supports the ability to specify a different RMI port for the SAS Analytics Platform Server. When starting the Web service, which is hosted from within the

SAS Analytics Platform Server, you need to indicate to the Web service that the SAS Analytics Platform Server is not on the default port of 5099 by specifying the following Java option: -Dcom.sas.analytics.forecasting.server.host=localhost:*<port-number>*

For example, if the SAS Analytics Platform Server is on port 5098, then you submit the following command:

```
-Dcom.sas.analytics.forecasting.server.host=localhost:5098
```

Chapter 13

SAS Forecast Server Administrative Macros

Contents

SAS Forecast Server Macros

Summary of SAS Forecast Server Macros

A SAS macro is a program that generates SAS statements. SAS macros make it easy to produce and execute complex SAS programs that would be time consuming to write yourself. When operations on SAS Forecast Server projects need to be repeated routinely, using the Java UI client can be time consuming. SAS Forecast Server macros enable you to create and manage SAS Forecast Server projects in a batch environment, which make repetitive operations on SAS Forecast Server projects more convenient.

The macros provide a SAS language interface to the SAS Forecast Server Java API, much in the same way the Java rich client does. Effectively, the macros are an alternative client to SAS Forecast Server. Many of the features that are available to you when creating a project with the UI client can be found in the macros. Additionally, the SAS Forecast Server macros enable you to perform administrative functions on a single project, or a group of projects. Figure 13.1 shows a schematic representation of how the macros interact with the other components of SAS Forecast Server.

Figure 13.1 SAS Forecast Server Components
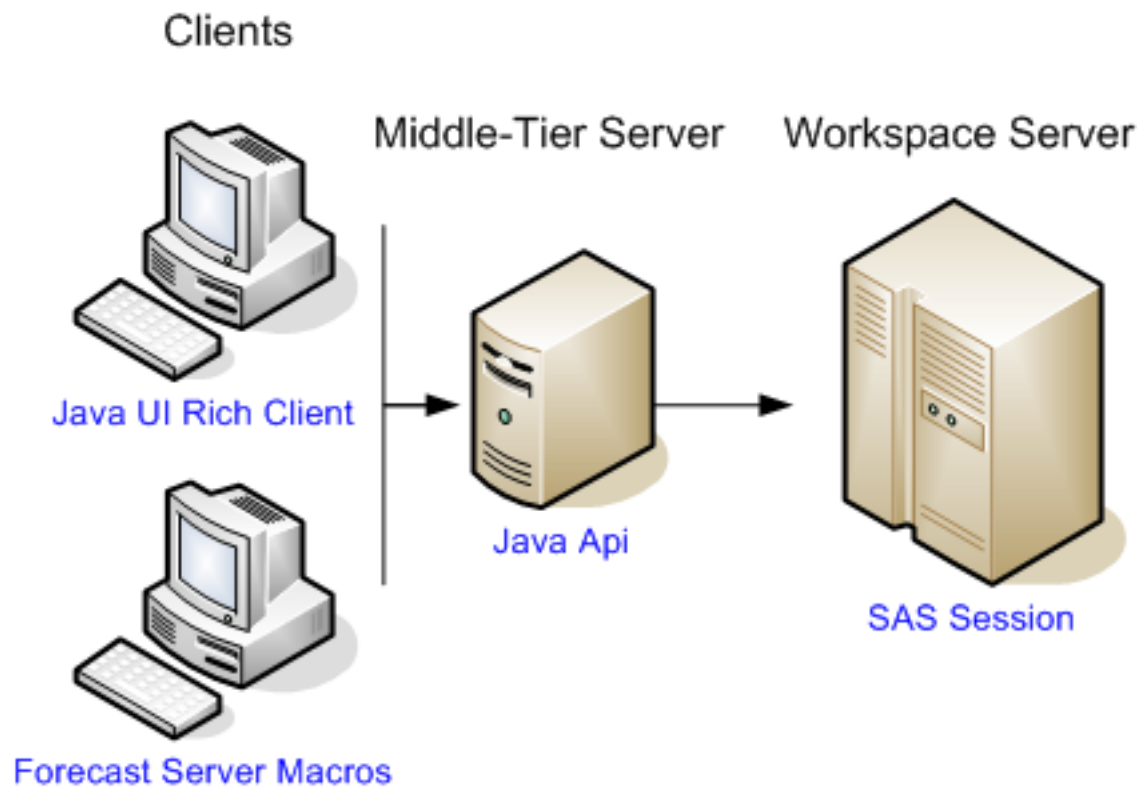
The SAS Forecast Server macros need to be run in a SAS Display Manager on the SAS Forecast

Server middle-tier server. The macros reside in an autocall library in **`!SASROOT/forecastmva/`**
`sasmacro` and are immediately available for you to use in your SAS Display Manager session.

Table 13.1 shows the SAS macros that are included in the SAS Forecast Server software.

Table 13.1   SAS Forecast Server Macros

Macro Name	Description
FSCOPY	Copies a SAS Forecast Server project to a new destination.
FSCREATE	Creates a new SAS Forecast Server project in batch mode.
FSDELARC	Deletes an archived SAS Forecast Server project.
FSDELPRJ	Deletes an existing SAS Forecast Server project.
FSEXP14	Exports all SAS Forecast Server 1.4 projects to archived files. This macro must be run on the SAS Forecast Server 1.4 middle tier machine.
FSEXPALL	Exports all SAS Forecast Server projects to archive files.
FSEXPORT	Exports a single SAS Forecast Server project to an archive file.
FSGETPRJ	Retrieves the metadata about the SAS Forecast Server projects.
FSIMPALL	Imports all SAS Forecast Server projects listed in a data set from archived files.
FSIMPORT	Imports a SAS Forecast Server project from an archived file.
FSLOAD	Opens an existing SAS Forecast Server project, and loads global macro variables that describe the project.
FSMIGALL	Migrates all existing SAS Forecast Server projects to the current version of SAS Forecast Server.
FSMIGPRJ	Migrates an existing SAS Forecast Server project to the current version of SAS Forecast Server.
FSMOVE	Moves a SAS Forecast Server project to a new destination.
FSREN	Renames a single SAS Forecast Server project.
FSRUNPRJ	Opens an existing SAS Forecast Server project, and runs the project at a given stage.
FSSETCRB	Assigns the creator of a SAS Forecast Server project.
FSSETLOC	Change the default location for SAS Forecast Server projects.
FSSETPUB	Determines whether public access to a SAS Forecast Server project should be enabled.
FSUNREG	Unregisters an existing SAS Forecast Server project from the metadata server. **NOTE:** Only an administrative user can deploy this macro.

For information about the SAS macro facility, see *SAS Macro Language: Reference* documentation.

Installation Instructions

Before using the SAS Forecast Server SAS macros, you must perform the following installation
steps so that the SAS Forecast Server API can be called within a SAS Display Manager session.

You need read/write administrative permissions to the SAS and SAS Forecast Server installation folders to perform these operations.

Installation Instructions for Windows

1. Stop the SAS Analytics Platform Server. From the Windows **Start** menu, select

   Programs →**SAS**→**SAS Analytics Platform Server**→**Stop AP Server**.

   Alternatively, you can stop the SAS Analytics Platform Server by executing a .bat file. At a DOS prompt, navigate to the `SAS_HOME\SASAPCore\bin` folder and use the following command:

   apserver.bat stop

2. Stop the SAS Metadata Server. From the Windows **Start** menu, select

   Programs →**SAS**→***<configuration-directory>***→**Stop SAS Metadata Server**.

   Alternatively, you can stop the SAS Metadata Server by executing a .bat file in the

   <path-to-config-dir>`\Lev1\SASMain\MetadataServer` folder.

3. Stop the SAS Object Spawner. From the Windows **Start** menu, select

   Programs →**SAS**→***<configuration-directory>***→**Stop SAS Object Spawner**.

   Alternatively, you can stop the SAS Object Spawner by executing a .bat file in the

   <path-to-config-dir>`\Lev1\SASMain\ObjectSpawner` folder.

4. Copy the sas.forecasting-remote.jar file from your SAS Forecast Server installation library folder `SAS_HOME\SASAPCore\apps\Forecasting\lib` to `!SASROOT\core\sasmisc`.

   For example, copy the .jar file from

   `C:\Program Files\SAS\SASAPCore\apps\Forecasting\lib`

   to `C:\Program Files\SAS\SAS 9.1\core\sasmisc`.

5. Copy the sas.apps.session.jar file from your SAS Analytics Platform Server installation library folder `SAS_HOME\SASAPCore\lib` to `!SASROOT\core\sasmisc`.

   For example, copy the .jar file from

   `C:\Program Files\SAS\SASAPCore\lib`

   to `C:\Program Files\SAS\SAS 9.1\core\sasmisc`.

6. Start the SAS Metadata Server. For information about starting the SAS Metadata Server, see "SAS Metadata Server " on page 100.

7. Start the SAS Object Spawner. For information, about starting the SAS Object Spawner, see "SAS Object Spawner" on page 104.

8. Start the SAS Analytics Platform Server. For information about starting the SAS Analytics Platform Server, see "SAS Analytics Platform Server " on page 103.

Installation Instructions for UNIX

1. Stop the SAS Analytics Platform Server. Open a terminal session and have an X server running. Navigate to the `SAS_HOME/SASAPCore/bin` directory, and execute the following command:

   `./apserver stop`

2. Stop the SAS Metadata Server. Navigate to the *<path-to-config-dir>*`/Lev1/SASMain/ MetadataServer` directory, and execute the script in that directory that stops the SAS Metadata Server.

3. Stop the SAS Object Spawner. Navigate to the *<path-to-config-dir>*`/Lev1/SASMain/ ObjectSpawner` directory, and execute the script in that directory that stops the SAS Object Spawner.

4. Create a symbolic link from
   `SASAPCore/apps/forecasting/lib/sas.forecasting-remote.jar`
   to `!SASROOT/misc/base`.

   For example:

   `ln -s SASAPCore/apps/forecasting/lib/sas.forecasting-remote.jar`
   `    /home/sas/SAS_9.1/misc/base/sas.forecasting-remote.jar`

5. Create a symbolic link from
   `SASAPCore/lib/sas.apps.session.jar`
   to `!SASROOT/misc/base`.

   For example:

   `ln -s SASAPCore/lib/sas.apps.session.jar`
   `    /home/sas/SAS_9.1/misc/base/sas.apps.session.jar`

6. Start the SAS Metadata Server. For information about starting the SAS Metadata Server, see "SAS Metadata Server " on page 100.

7. Start the SAS Object Spawner. For information, about starting the SAS Object Spawner, see "SAS Object Spawner" on page 104.

8. Start the SAS Analytics Platform Server. For information about starting the SAS Analytics Platform Server, see "SAS Analytics Platform Server " on page 103.

Copy a Project to a New Location: FSCOPY Macro

The FSCOPY macro copies a SAS Forecast Server project to a new destination.
NOTE: Both servers must run the same version or higher of SAS Forecast Server.

Syntax

The FSCOPY macro has the following form:

%FSCOPY *(SOURCEPROJECTNAME=, DESTINATIONPROJECTNAME=, SOURCEUSER=, DESTINATIONUSER=, SOURCEPASSWORD=, DESTINATIONPASSWORD=, REMOTEARCHIVEFOLDER= [, options])* **;**

Required Arguments

The following arguments must be used with the FSCOPY macro. The required arguments are separated by commas.

SOURCEPROJECTNAME= *source-project-name*
> specifies the name of the SAS Forecast Server project on the source host. The name must be a valid SAS name.

DESTINATIONPROJECTNAME= *destination-project-name*
> specifies the name of the SAS Forecast Server project on the destination host. The name must be a valid SAS name.

SOURCEUSER= *username*
> specifies the user name that you use to log on to SAS Forecast Studio on the source host.

DESTINATIONUSER= *username*
> specifies the user name that you use to log on to SAS Forecast Studio on the destination host.

SOURCEPASSWORD= *password*
> specifies the source user's password that you use to log on to SAS Forecast Studio.

DESTINATIONPASSWORD= *password*
> specifies the destination user's password that you use to log on to SAS Forecast Studio.

REMOTEARCHIVEFOLDER= *foldername*
> specifies the folder where the archived projects of the SOURCEWORKSPACE= server are to be found on the DESTINATIONWORKSPACE= server (for example, `\\sourceserver\SAS\ForecastStudio\Archives`). **NOTE:** That DESTINATIONUSER= must have read/write privileges to the REMOTEARCHIVEFOLDER= folder.

Options

The following options can be used with the FSCOPY macro. Options must follow the required arguments and are separated by commas.

ARCHIVEFOLDER= *foldername*

> specifies the folder on the DESTINATIONWORKSPACESERVER= server where the archive is to be saved. If not specified, the default location is used.

SOURCEHOST= *host:port*

> specifies the source host and port of the SAS Forecast Server Mid-Tier. The default is local-host:5099.

DESTINATIONHOST= *host:port*

> specifies the destination host and port of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

SOURCEWORKSPACE= *workspace-server-name*

> specifies the name of the SAS Workspace Server to be used as source. It is required only if there are multiple workspace servers defined in the metadata server.

DESTINATIONWORKSPACE= *workspace-server-name*

> specifies the name of the SAS Workspace Server to be used as destination. It is required only if there are multiple workspace servers defined in the metadata server.

DESCRIPTION= *text*

> specifies the project description.

NOWARN= *YES | NO*

> suppresses errors if the SAS Forecast Server project does not exist. Possible values are YES | NO. The default is NOWARN=NO.

TMPARCHIVENAME= *value*

> specifies the name of the temporary archived project. The default is _fs_tmp_archive. The name must not match an existing archive.

Example

```
%fscopy( sourceprojectname=prdat2,
        destinationprojectname=prdat3,
        description=copied project,
        sourceuser=sasuser,
        sourcepassword=saspass,
        destinationuser=sasuser2,
        destinationpassword=saspass2,
        remotearchive=C:\SAS\ForecastStudio\Archives,
        tmparchivename=my_fs_tmp_archive,
        nowarn=NO
        );
```

Results

The FSCOPY global macro variable indicates whether the FSCOPY macro terminates successfully or encounters errors:

&FSCOPY = SUCCESS | ERROR

Create a New Project in Batch Mode: FSCREATE Macro

The FSCREATE macro creates a new SAS Forecast Server project in batch mode.

Syntax

The FSCREATE macro has the following form:

> **%FSCREATE** *(PROJECTNAME=, USER=, PASSWORD=, DATA=, ID=, VAR= [, options])* **;**

Required Arguments

The following arguments must be used with the FSCREATE macro. The required arguments are separated by commas.

PROJECTNAME= *project-name*
> specifies the name of the SAS Forecast Server project. The name must be a valid SAS name.

USER= *username*
> specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*
> specifies the user password that you use to log on to SAS Forecast Studio.

DATA= *SAS-data-set*
> specifies the name of the input SAS data set.

ID= *variable*
> specifies the time ID variable.

VAR= *variable*
> specifies the dependent variable(s). Multiple variable names can be specified only if HIER-ARCHY=NO | FALSE. Multiple variable names are separated by a space.

Options

The following options can be used with the FSCREATE macro. Options must follow the required arguments, and are separated by commas.

ACCUMULATE= *TYPE [TYPE(var1 var2) TYPE(var3 var4) ...]*

        specifies the accumulation option(s)of the dependent, input, and reporting variables.
        Valid types are the following:

NONE	specifies that no accumulation occurs; the ID variable values must be equally spaced with respect to the frequency. This is the default option.
TOTAL	specifies that observations are accumulated based on the total sum of their values.
AVERAGE | AVG	specifies that observations are accumulated based on the average of their values.
MINIMUM | MIN	specifies that observations are accumulated based on the minimum of their values.
MEDIAN | MED	specifies that observations are accumulated based on the median of their values.
MAXIMUM | MAX	specifies that observations are accumulated based on the maximum of their values.
N	specifies that observations are accumulated based on the number of nonmissing observations.
NMISS	specifies that observations are accumulated based on the number of missing observations.
NOBS	specifies that observations are accumulated based on the number of observations.
FIRST	specifies that observations are accumulated based on the first of their values.
LAST	specifies that observations are accumulated based on the last of their values.
STDDEV | STD	specifies that observations are accumulated based on the standard deviation of their values.
CSS	specifies that observations are accumulated based on the corrected sum of squares of their values.
USS	specifies that observations are accumulated based on the uncorrected sum of squares of their values.

Examples: Apply AVG accumulation to all variables: ACCUMULATE=AVG

Apply TOTAL accumulation to all variables except for var1, which will be AVG: ACCUMULATE=TOTAL AVG(var1)

Apply TOTAL accumulation to all variables except for var1 and var2, which is AVG, and var3 which is STD: ACCUMULATE=TOTAL AVG(var1 var2) STD(var3)

Apply the default accumulation for all variables, which is TOTAL.

AGGREGATE= *TYPE [TYPE(var1 var2) TYPE(var3 var4) ...]*

> specifies the aggregation option(s) of the dependent, input, and reporting variables. Aggregation is only valid if hierarchy=YES. See the ACCUMULATE option for valid values and examples. **NOTE:** For the dependent variable the only valid values are TOTAL | AVERAGE | AVG.

ALLOWNEGATIVE= *YES | TRUE | NO | FALSE*

> specifies whether negative forecasts are allowed. The default value is NO.

ALPHA= *n*

> specifies the confidence level for the series. The default value is 0.05, which is a 95% confidence level.

ARIMAX= *YES | TRUE | NO | FALSE*

> specifies whether ARIMA models should be considered. The default value is YES.

BACK= *n*

> specifies the out of sample range (periods from end). The default value is 0.

BY= *variable*

> specifies the BY variable(s). Multiple variable names can be specified, separated by a space.

CRITERION= *options*

> specifies the model selection criterion (statistic of fit) to be used to select from several candidate models. The default value is MAPE.

DESCRIPTION= *text*

> specifies the project description.

DETECTOUTLIERS= *YES | TRUE | NO | FALSE*

> specifies whether outliers in the data should be detected when fitting an ARIMA model. The default value is NO.

DISAGGREGATION= *PROPORTIONS | EQUALSPLIT*

> specifies the disaggregation method for reconciliation. The default value is PROPORTIONS.

END= *date*

> specifies the last date to use in data preparation. The date format is DDMMMYYY and the date/time format is DDMMMYYYY:HH:MM:SS. The default value is the latest date in the input data set.

ESM= *YES | TRUE | NO | FALSE*

> specifies whether exponential smoothing models (ESM) should be considered. The default value is YES.

HIERARCHY= *YES | TRUE | NO | FALSE*

> specifies whether the BY variable(s) should be considered hierarchical. The default value is NO.

HOLDOUT= *n | NO | FALSE*

      specifies the number of periods to be used as the holdout sample for model selection. To disable the holdout, specify NO | FALSE.

HOLDOUTPCT= *n | NO | FALSE*

      specifies the number of periods as a percentage of the series length to be used as the holdout sample for model selection. To disable the HOLDOUTPCT, specify NO | FALSE.

HOST= *host:port*

      specifies the host and port number of the Forecast Server Mid-Tier. The default is local-host:5099.

IDFORMAT= *date*

      specifies the date/time format of the values in the time ID variable.

INDEXFILES= *YES | TRUE | NO | FALSE*

      specifies whether index files should be generated for the output data sets. The default value is YES.

INPUT= *variable*

      specifies the input (or independent) variable(s). Multiple variable names can be specified, separated by a space.

INTERMITTENT= *n | NO | FALSE*

      specifies the sensitivity of the time series intermittent test. The default value is 2. To disable the test, specify NO | FALSE.

INTERVAL= *interval-measure*

      specifies the time interval of the time ID variable.

      Valid values are the following:
      DAY | HOUR | MINUTE | MONTH | QUARTER | SECOND | SEMIMONTH | SEMIYEAR | TEN-DAY | WEEK | WEEKDAY | YEAR

      The default value is detected automatically when possible.

LEAD= *n*

      specifies the number of periods into the future which multiple step forecasts are made. The default value is 12.

MINOBSTREND= *n*

      specifies the minimum number of observations needed for a trend model. The default value is 2.

MINOBSNONMEAN= *n*

      specifies the minimum number of observations needed for a non-mean model. The default value is 1.

MODELSELECTIONLIST= *SAS-data-set*

      specifies a model selection list that contains models you can use. The default value is SASHELP.HPFDFLT.TSFSSELECT.

PUBLICACCESS= *YES | TRUE | NO | FALSE*

 specifies whether the project is available to be opened by other users. The default value is NO.

RECONCILIATION= *reconciliation-methd*

 specifies the reconciliation direction. The default value is BOTTOMUP.

 Valid values are the following:
 TOPDOWN | TD | BOTTOMUP | BU | MIDDLEOUT(BY-variable) | MO(BY-variable) | NO | FALSE

 For MIDDLEOUT reconciliation, the BY variable must be supplied in order to specify the reconciliation level.

 Examples:
 Top-down reconciliation: RECONCILIATION=TOPDOWN
 Middle-out reconciliation, starting at regionName: RECONCILIATION=MIDDLEOUT(regionName)

 To disable reconciliation, specify NO | FALSE.

REPORTING= *variable*

 specifies the reporting (or auxiliary) variable(s). Multiple variable names can be specified, separated by a space.

RUN= *YES | TRUE | NO | FALSE*

 specifies whether to produce forecasts when the project is created. The default value is YES.

SEASONALITY= *n*

 specifies the length of a season. The default value is detected automatically when possible.

SEASONTEST= *n | NO | FALSE*

 specifies the sensitivity of the seasonality test. The default value is 0.01. To disable the test, specify NO | FALSE.

SETMISSING= *0 | MISSING | AVG | MIN | MED | MAX | FIRST | LAST | PREV | NEXT*

 specifies the missing value interpretation. The default value is MISSING.

START= *date*

 specifies the first date to use in data preparation. The date format is DDMMMYYY and the date/time format is DDMMMYYYY:HH:MM:SS. The default value is the earliest date in the input data set.

TIMEMULTIPLIER= *n*

 specifies the multiplier for the value specified as the interval.

TIMESHIFT= *n*

 specifies the offset for the interval.

TRANSBOXCOX= *n*

 specifies the Box-Cox value if the transformation type (transtype) is BOXCOX. The default is 1.

TRANSOPT= *MEAN | MEDIAN*

     specifies the transformation option. The default is MEAN.

TRANSTYPE= *AUTO | LOG | NONE | SQRT | LOGISTIC | BOXCOX*

     specifies the transformation function type.

TRIMMISS= *NONE | LEFT | RIGHT | BOTH*

     specifies the leading/trailing missing value interpretation. The default value is NONE.

UCM= *YES | TRUE | NO | FALSE*

     specifies whether unobserved component models (UCM) should be considered. The default value is NO.

WEEKENDDAYS= *1 | 2 | 3 | 4 | 5 | 6 | 7*

     specifies which days are the weekend (or inactive) days in the week. Only valid when the interval=WEEKDAY. The days are specified as numbers (1 through 7) representing the days of the week (Sunday through Saturday).

     Examples:
     To specify Saturday and Sunday: WEEKENDDAYS=17
     To specify Friday and Saturday: WEEKENDDAYS=67

WORKSPACE= *workspace-server-name*

     specifies the name of the SAS Workspace Server where the SAS Forecast Server project is created. If there are multiple workspace servers defined in metadata, then the WORKSPACE= option is required.

ZEROMISS= *NONE | LEFT | RIGHT | BOTH*

     specifies the leading/trailing zero interpretation. The default value is NONE.

Example

```
%fscreate(projectname=pd1,
          user=sasguest,
          password=Password1,
          workspace=SASMain,
          data=sashelp.pricedata,
          id=date,
          by=regionName productLine productName,
          hierarchy=YES,
          var=sale,
          input=price discount,
          reporting=price1 price2 price3,
          accumulate=TOTAL AVG(price) NONE(price1 price3),
          aggregate=NONE total(sale) MIN(price1 price3),
          disaggregation=EQUALSPLIT,
          reconciliation=NO,
          publicaccess=YES,
          setmissing=last,
          zeromiss=left,
          trimmiss=right,
```

```
                    back=1,
                    start=01Feb1998,
                    end=01Nov2002,
                    interval=MONTH,
                    seasonality=12,
                    idformat=MMYY.,
                    timemultiplier=1,
                    timeshift=1,
                    weekenddays=45,
                    arimax=YES,
                    esm=YES,
                    UCM=NO,
                    modelselectionlist=sashelp.hpfdflt.tsfsselect,
                    detectoutliers=YES,
                    intermittent=NO,
                    seasontest=0.3,
                    holdout=NO,
                    holdoutpct=2,
                    minobstrend=2,
                    minobsnonmean=2,
                    criterion=MAPE,
                    lead=24,
                    alpha=0.10,
                    allownegative=NO,
                    indexfiles=FALSE,
                    description=foo bar stuff,
                    transopt=MEDIAN,
                    transtype=boxcox,
                    transboxcox=2
                    );
```

Results

The fscreate global macro variable indicates whether the FSCREATE macro finishes successfully or encounters errors:
&FSCREATE = SUCCESS | ERROR

In addition, there are a series of global macro variables that are populated after a SAS Forecast Server project is created. These macro variables describe the project, and enable additional SAS code to be written in a generic manner to utilize and explore the data that are contained in a SAS Forecast Server project. These macro variables are available to stored process developers. For more information about the macro variables, see Chapter 12, "Administration Tasks."

Delete an Archived Project: FSDELARC Macro

The FSDELARC macro deletes an archived SAS Forecast Server project.

Syntax

The FSDELARC macro has the following form:

> **%FSDELARC** *(PROJECTNAME , ARCHIVENAME, USER, PASSWORD [, options])* **;**

Required Arguments

The following arguments must be used with the FSDELARC macro. The required arguments are separated by commas.

PROJECTNAME= *project-name*
> specifies the name of the SAS Forecast Server project. The name must be a valid SAS name.

ARCHIVENAME= *archived-project-name*
> specifies the name of the archived project.

USER= *username*
> specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*
> specifies the user password that you use to log on to SAS Forecast Studio.

Options

The following options can be used with the FSDELARC macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*
> specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*
> specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

NOWARN= *YES | NO*
> specifies whether to suppress errors if the SAS Forecast Server project does not exist. The default is NOWARN=NO.

Example

```
%fsdelarc(projectname=pd1,
          archiveName=ArchPD1.far,
          user=sasuser,
          password=saspass,
          host=localhost:5099,
          nowarn=NO
          );
```

Results

The FSDELARCH global macro variable indicates whether the FSDELARC macro finishes successfully or encounters errors:

&FSDELSARC = SUCCESS | ERROR

Delete an Existing Project: FSDELPRJ Macro

The FSDELPRJ macro deletes one project and, optionally, the related archives contained in the default archiving folder.

Syntax

The FSDELPRJ macro has the following form:

> **%FSDELPRJ** *(PROJECTNAME , USER, PASSWORD [, options])* **;**

Required Arguments

The following arguments must be used with the FSDELPRJ macro. The required arguments are separated by commas.

PROJECTNAME= *project-name*
>   specifies the name of the SAS Forecast Server project. The name must be a valid SAS name.

USER= *username*
>   specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*
>   specifies the user password that you use to log on to SAS Forecast Studio.

Options

The following options can be used with the FSDELPRJ macro. Options must follow the required arguments and are separated by commas.

DELETEARCHIVES= *host:port*
>   specifies whether the project archives are to be deleted. Valid values are YES|NO|TRUE|FALSE. By default all archives are deleted with the project.

HOST= *host:port*
>   specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*
>   specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

NOWARN= *YES | NO*
>   specifies whether to suppress errors if the SAS Forecast Server project does not exist. The default is NOWARN=NO.

Example

```
%fsdelprj(projectname=prdat4,
          user=sasuser,
          password=saspass
          );
```

Results

The FSDELPRJ global macro variable indicates whether the FSDELARC macro finishes successfully or encounters errors:
&FSDELPRJ = SUCCESS | ERROR

Archive All SAS Forecast Server 1.4 Projects: FSEXP14 Macro

The FSEXP14 macro exports all SAS Forecast Server 1.4 projects to archived files. This macro must be run on the SAS Forecast Server 1.4 middle tier machine. The java executable file must be in the search path of the operating system.

Syntax

The FSEXP14 macro has the following form:

>   **%FSEXP14** *(USER=, PASSWORD=, OUT=, FORECASTINGREMOTEPATH= [, options])* **;**

Required Arguments

The following arguments must be used with the FSEXP14 macro. The required arguments are separated by commas.

USER= *username*

>   specifies the administrative user name that you use to log on to SAS Forecast Studio. The user must be a SAS administrator.

PASSWORD= *password*

>   specifies the administrative user password that you use to log on to SAS Forecast Studio.

OUT= *SAS-data-set*

>   specifies the fully qualified name of the data set that contains information about the archived projects. The format is *library.dataset*.

FORECASTINGREMOTEPATH= *SAS-data-set*

>   specifies the path to the *sas.forecasting-remote.jar* file. For example, the typical path on a Windows operating environment is `C:\Program Files\SAS\SAS 9.1\core\sasmisc\ sas.forecasting-remote.jar`

Options

The following options can be used with the FSEXP14 macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*

>   specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

NAMESUFFIX= *string*

>   specifies a suffix to the name of the archive. The suffix must make the archive name unique. If an archive with the same name exists, then archiving fails for that project. The default suffix is _fs_export_14.

KEEPLOG= *0 | 1*

>   specifies the conditions for keeping the log.
>   0= keep only log files for which an exception is encountered. This is the default value. 1= keep all log files.

LOGFILEFOLDER= *0 | 1*

>   specifies the folder where to save the log files (e.g., LOGFILEFOLDER=`C:\log`). The default location is the current directory. The log files are named <projectname>.log, where projectname is the name of the related project.

Example

```
%fsexp14(out=work.projects,
        user=sasadm,
        password=sasadmpass,
        ForecastingRemotePath=
        C:\Program Files\SAS\SAS 9.1\core\sasmisc\sas.forecasting-remote.jar,
        host=localhost:5099,
        nameSuffix=_fs_export14,
        keepLog=1,
        logFileFolder=c:\temp
        );
```

Results

The FSEXP14 global macro variable indicates whether the FSEXP14 macro finishes successfully or encounters errors:
&FSEXP14 = SUCCESS | ERROR

The OUT= option produces a SAS data set that contains the following variables:

NAME	specifies the SAS Forecast Server project name.
CREATED	specifies the date/time when the project is created.
MODIFIED	specifies the date/time when the project is last modified.
CREATEDBY	specifies the user ID who created the project initially.
LOCKED	equals 1 if the project is locked (currently opened by another user).
CANOPEN	equals 1 if the user can open the project.
CANDELETE	equals 1 if the user can delete the project.
ISPUBLIC	this variable is always equal to 0 for the FSEXP14 macro because the Forecast Server 1.4 API does not support querying the public access flag.
ARCHIVENAME	specifies the name of the archived project.
ARCHIVEFAIL	equals 1 if an error was detected during archiving the project.

Additionally, archives for all projects are created in the default archive folder. The name of the archives are the name of the project followed by the NAMESUFFIX= parameter.
CAUTION: The libname _tmpfsar is a SAS reserved name. You cannot use the name _tmpfsar for other libraries.

Details

The FSEXP14 macro spawns shell windows for archiving SAS Forecast Server 1.4 projects. If the shell does not close automatically after finishing one project, but, instead, it returns a command prompt, you need to type "exit" at the prompt to close the window and continue processing other projects.

NOTE: The FSEXP14 macro does not support multiple SAS Workspace Servers. It functions only if one SAS Workspace Server is defined.

Archive All SAS Forecast Server Projects: FSEXPALL Macro

The FSEXPALL macro exports all SAS Forecast Server projects to archived files.

Syntax

The FSEXPALL macro has the following form:

%FSEXPALL *(USER=, PASSWORD=, OUT= [, options])* **;**

Required Arguments

The following arguments must be used with the FSEXPALL macro. The required arguments are separated by commas.

USER= *username*
> specifies the administrative user name that you use to log on to SAS Forecast Studio. The user must be a SAS administrator.

PASSWORD= *password*
> specifies the administrative user password that you use to log on to SAS Forecast Studio.

OUT= *SAS-data-set*
> specifies the fully qualified name of the data set that contains information about the archived projects. The format is *library.dataset*.

Options

The following options can be used with the FSEXPALL macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*
> specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*
> specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

NAMESUFFIX= *string*
> specifies a suffix to the name of the archive. The suffix must make the archive name unique. If an archive with the same name exists, then archiving fails for that project. The default suffix is _fs_export.

Example

```
%fsexpall(out=work.projects,
        user=sasadm,
        password=sasadmpass,
        host=localhost:5099,
        nameSuffix=_fs_export21,
        );
```

Results

The FSEXPALL global macro variable indicates whether the FSEXPALL macro finishes success-
fully or encounters errors:
&FSEXPALL = SUCCESS | ERROR

The OUT= option produces a SAS data set that contains the following variables:

NAME	specifies the SAS Forecast Server project name.
CREATED	specifies the date/time when the project is created.
MODIFIED	specifies the date/time when the project is last modified.
CREATEDBY	specifies the user ID who created the project initially.
LOCKED	equals 1 if the project is locked (currently opened by another user).
CANOPEN	equals 1 if the user can open the project.
CANDELETE	equals 1 if the user can delete the project.
ISPUBLIC	equals 1 if the project has public access.
ARCHIVENAME	specifies the name of the archived project.
ARCHIVEFAIL	equals 1 if an error was detected during archiving the project.

Additionally, archives for all projects are created in the default archive folder. The name of the
archives are the name of the project followed by the NAMESUFFIX= parameter.

Archive a Single Project: FSEXPORT Macro

The FSEXPORT macro exports a single SAS Forecast Server project to an archive file.

Syntax

The FSEXPORT macro has the following form:

%FSEXPORT *(PROJECTNAME, ARCHIVENAME, DESCRIPTION, USER, PASSWORD [, options])* **;**

Required Arguments

The following arguments must be used with the FSEXPORT macro. The required arguments are separated by commas.

PROJECTNAME= *project-name*
> specifies the name of the SAS Forecast Server project. The name must be a valid SAS name.

ARCHIVENAME= *archived-project-name*
> specifies the name of the archived project.

DESCRIPTION= *text*
> specifies the project description. If a comma is present in the description string, the description must be enclosed in quotes.

USER= *username*
> specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*
> specifies the user password that you use to log on to SAS Forecast Studio.

Options

The following options can be used with the FSEXPORT macro. Options must follow the required arguments and are separated by commas.

ARCHIVEFOLDER= *host:port*
> specifies the folder on the WORKSPACESERVER= server where the archive is to be saved. If not specified, the default location is used.

HOST= *host:port*
> specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*
> specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

NOWARN= *YES | NO*

>   specifies whether to suppress errors if the SAS Forecast Server project does not exist. The default is NOWARN=NO.

Example

```
%fsexport( projectname=pd1,
           archiveName=ArchPD1,
           description=Project pd1,
           user=sasuser,
           password=saspass
           );
```

Results

The global macro variable fsexport indicates whether the FSEXPORT macro finishes successfully or encounters errors:
&FSEXPORT = SUCCESS | ERROR

Also, an archived project with the ARCHIVENAME= file name is created in the default archive folder.

Retrieve Project Information: FSGETPRJ Macro

The FSGETPRJ macro retrieves information about the SAS Forecast Server projects.

Syntax

The FSGETPRJ macro has the following form:

>   **%FSGETPRJ** *(OUT=, USER=, PASSWORD= [, options])* **;**

Required Arguments

The following arguments must be used with the FSGETPRJ macro. The required arguments are separated by commas.

OUT= *SAS-data-set*

>   specifies the name of the data set that contains the program results.

USER= *username*

>   specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*
> specifies the user password that you use to log on to SAS Forecast Studio.

Options

The following options can be used with the FSGETPRJ macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*
> specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*
> specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

Example

```
%fsgetprj(out=work.getprojects,
          user=sasuser,
          password=saspass
          ) ;
```

Results

The fsgetprj global macro indicates whether the FSGETPRJ macro finishes successfully or encounters errors:
fsgetprj = SUCCESS | ERROR.

The OUT= option produces a SAS data set that contains the following variables:

NAME	specifies the SAS Forecast Server project name.
CREATED	specifies the date/time when the project is created.
MODIFIED	specifies the date/time when the project is last modified.
CREATEDBY	specifies the user ID who created the project initially.
LOCKED	equals 1 if the project is locked (currently opened by another user).
CANOPEN	equals 1 if the user can open the project.
CANDELETE	equals 1 if the user can delete the project.
ISPUBLIC	equals 1 if the project has public access.

Import all Archived Projects: FSIMPALL Macro

The FSIMPALL macro imports all SAS Forecast Server archived files listed in the PROJECTDS= data set.

Syntax

The FSIMPALL macro has the following form:

%FSIMPALL *(PROJECTDS=, ARCHIVEFOLDER=, USER=, PASSWORD= [, options])* **;**

Required Arguments

The following arguments must be used with the FSIMPALL macro. The required arguments are separated by commas.

PROJECTDS= *SAS-data-set*

specifies the SAS data set containing the list of the SAS Forecast Server projects to import. It can be a fully qualified data set name in the form library.dataset. Typically, the PROJECTDS= data set is created using the OUT= option of the FSEXPALL macro or of the FSEXP14 macro.

The PROJECTDS= data set must be a SAS data set that contains the following variables:

NAME	specifies the SAS Forecast Server project name.
CREATED	specifies the date/time when the project is created.
CREATEDBY	specifies the user ID who created the project initially.
CANOPEN	equals 1 if the user can open the project.
CANDELETE	equals 1 if the user can delete the project.
ISPUBLIC	equals 1 if the project has public access.
ARCHIVENAME	The name of the archive.
ARCHIVEFAIL	equals 1 if an error was detected during archiving.

NOTE: only projects for which ARCHIVEFAIL = 0 will be unarchived.

ARCHIVEFOLDER= *project-name*

specifies the folder on the WORKSPACE= server containing the archived projects. The archives must be in subfolders named projectname/archivename.

USER= *username*

specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*

specifies the user password that you use to log on to SAS Forecast Studio.

Options

The following options can be used with the FSIMPALL macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*
> specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*
> specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

NOWARN= *YES | NO*
> specifies whether to suppress errors if the SAS Forecast Server project does not exist. The default is NOWARN=NO.

Example

```
%fsimpall(projectds=work.projects,
         archiveFolder=C:\SAS\ForecastStudio\Archives,
         user=sasdemo,
         password=Password1
         );
```

Results

The FSIMPALL global macro variable indicates whether the FSIMPALL macro finishes successfully or encounters errors:
&FSIMPALL = SUCCESS | ERROR

NOTE: If the archives contain projects that were created with a previous version of SAS Forecast Server, then these project are migrated to the current version.

Import an Archived Project: FSIMPORT Macro

The FSIMPORT macro imports a SAS Forecast Server archived file.

Syntax

The FSIMPORT macro has the following form:

> **%FSIMPORT** *(PROJECTNAME=, ARCHIVEPATH=, USER=, PASSWORD= [, options])* **;**

Required Arguments

The following arguments must be used with the FSIMPORT macro. The required arguments are separated by commas.

PROJECTNAME= *project-name*
> specifies the name of the SAS Forecast Server project. The name must be a valid SAS name.

ARCHIVEPATH= *project-name*
> specifies the location of the archived project.

USER= *username*
> specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*
> specifies the user password that you use to log on to SAS Forecast Studio.

Options

The following options can be used with the FSIMPORT macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*
> specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*
> specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

NOWARN= *YES* | *NO*
> specifies whether to suppress errors if the SAS Forecast Server project does not exist. The default is NOWARN=NO.

Example

```
%fsimport(projectname=prdat2,
          archivePath=C:/SAS/ForecastStudio/Archives/pd1/ArchPD1.far,
          user=sasuser,
          password=saspass
          );
```

Results

The FSIMPORT global macro variable indicates whether the FSIMPORT macro finishes successfully or encounters errors:
&FSIMPORT = SUCCESS | ERROR

Open a Project and Load Global Macro Variables: FSLOAD Macro

The FSLOAD macro opens an existing SAS Forecast Server project, and loads global macro variables that describe the project.

Syntax

The FSLOAD macro has the following form:

%FSLOAD *(PROJECTNAME=, USER=, PASSWORD= [, options])* **;**

Required Arguments

The following arguments must be used with the FSLOAD macro. The required arguments are separated by commas.

PROJECTNAME= *project-name*
> specifies the name of the SAS Forecast Server project. The name must be a valid SAS name.

USER= *username*
> specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*
> specifies the user password that you use to log on to SAS Forecast Studio.

Options

The following options can be used with the FSLOAD macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*
> specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*
> specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

Example

```
%fsload(projectname=pd1,
        user=sasuser,
        password=saspass
        ) ;
```

Results

The global macro variable FSLOAD indicates whether the FSLOAD macro finishes successfully or encounters errors:
&FSLOAD = SUCCESS | ERROR

In addition, there are a series of global macro variables that are populated after a SAS Forecast Server project is loaded. These macro variables describe the project, and enable additional SAS code to be written in a generic manner in order to use and explore the data that are contained in a SAS Forecast Server project. These macro variables are available to stored process programs. For more information about the macro variables, see Chapter 12, "Administration Tasks.".

Migrate all Projects to Current SAS Forecast Server Version: FSMIGALL Macro

The FSMIGALL macro migrates all registered projects to the current version of SAS Forecast Server.

Syntax

The FSMIGALL macro has the following form:

%FSMIGALL *(USER=, PASSWORD=, OUT= [, options])* **;**

Required Arguments

The following arguments must be used with the FSMIGALL macro. The required arguments are separated by commas.

USER= *username*
> specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*
> specifies the user password that you use to log on to SAS Forecast Studio.

OUT= *SAS-data-set*
> specifies the fully qualified name of the data set which will contains information regarding the archived projects. The format is library.dataset.

Options

The following options can be used with the FSMIGALL macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*
> specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*
> specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

Example

```
%fsmigall(user=sasdemo,
          password=Password1,
          out=work.migrated,
          ) ;
```

Results

The global macro variable FSMIGALL indicates whether the FSMIGALL macro finishes successfully or encounters errors:
&FSMIGALL = SUCCESS | ERROR

The OUT= option produces a SAS data set that contains the following variables:

NAME	specifies the SAS Forecast Server project name.
CREATED	specifies the date/time when the project is created.
MODIFIED	specifies the date/time when the project is last modified.
CREATEDBY	specifies the user ID who created the project initially.
LOCKED	equals 1 if the project is locked (currently opened by another user).
CANOPEN	equals 1 if the user can open the project.
CANDELETE	equals 1 if the user can delete the project.
ISPUBLIC	equals 1 if the project has public access.
ISMIGRATED	equals 1 if the project was successfully migrated.

Migrate a Project to Current SAS Forecast Server Version: FSMIGPRJ Macro

The FSMIGPRJ macro migrates an existing SAS Forecast Server project to the current version of SAS Forecast Server.

Syntax

The FSMIGPRJ macro has the following form:

%FSMIGPRJ *(PROJECTNAME=, USER=, PASSWORD= [, options])* ;

Required Arguments

The following arguments must be used with the FSMIGPRJ macro. The required arguments are separated by commas.

PROJECTNAME= *project-name*

specifies the name of the SAS Forecast Server project. The name must be a valid SAS name.

USER= *username*

specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*

specifies the user password that you use to log on to SAS Forecast Studio.

Options

The following options can be used with the FSMIGPRJ macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*

specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*

specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

Example

```
%fsmigprj(projectname=pd1,
         user=sasuser,
         password=saspass
         ) ;
```

Results

The global macro variable FSMIGPRJ indicates whether the FSMIGPRJ macro finishes successfully or encounters errors:
&FSMIGPRJ = SUCCESS | ERROR

Move a Project to a Different Location: FSMOVE Macro

The FSMOVE macro moves a SAS Forecast Server project to a new destination.

Syntax

The FSMOVE macro has the following form:

%FSMOVE *(SOURCEPROJECTNAME=, DESTINATIONPROJECTNAME=, DESCRIP-TION=, SOURCEUSER=, DESTINATIONUSER=, SOURCEPASSWORD=, DES-TINATIONPASSWORD=, ARCHIVEPATH=, REMOTEARCHIVEFOLDER= [, options])* **;**

Required Arguments

The following arguments must be used with the FSMOVE macro. The required arguments are separated by commas.

SOURCEPROJECTNAME= *source-project-name*
> specifies the name of the SAS Forecast Server project on the source host. The name must be a valid SAS name.

DESTINATIONPROJECTNAME= *destination-project-name*
> specifies the name of the SAS Forecast Server project on the destination host. The name must be a valid SAS name.

DESCRIPTION= *text*
> specifies the project description.

SOURCEUSER= *username*
> specifies the user name that you use to log on to SAS Forecast Studio on the source host.

DESTINATIONUSER= *username*
> specifies the user name that you use to log on to SAS Forecast Studio on the destination host.

SOURCEPASSWORD= *password*
> specifies the source user's password that you use to log on to SAS Forecast Studio.

DESTINATIONPASSWORD= *password*
> specifies the destination user's password that you use to log on to SAS Forecast Studio.

REMOTEARCHIVEFOLDER= *project-name*
> specifies the location of the archived project on DESTINATIONWORKSPACE=. For example, **\\sourceserver\SAS\ForecastStudio\Archives**.

Options

The following options can be used with the FSMOVE macro. Options must follow the required arguments and are separated by commas.

SOURCEHOST= *n*
>	specifies the source host and port of the SAS Forecast Server Mid-Tier. The default is local-host:5099.

DESTINATIONHOST= *value*
>	specifies the destination host and port of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

SOURCEWORKSPACE= *workspace-server-name*
>	specifies the name of the SAS Workspace Server to be used as source. It is required only if there are multiple workspace servers defined in the metadata server.

DESTINATIONWORKSPACE= *workspace-server-name*
>	specifies the name of the SAS Workspace Server to be used as destination. It is required only if there are multiple workspace servers defined in the metadata server.

NOWARN= *YES | NO*
>	suppresses errors if the SAS Forecast Server project does not exist. Possible values are YES | NO. The default is NOWARN=NO.

TMPARCHIVENAME= *value*
>	specifies the name of the temporary archived project. The default is _fs_tmp_archive. The name must not match an existing archive.

Example

```
%fsmove( sourceprojectname=prdat2,
        destinationprojectname=prdat3,
        description=copied project,
        sourceuser=sasuser,
        sourcepassword=saspass,
        destinationuser=sasuser2,
        destinationpassword=saspass2,
        remotearchive=C:\SAS\ForecastStudio\Archives,
        nowarn=NO
        );
```

Results

The FSMOVE global macro variable indicates whether the FSMOVE macro finishes successfully or encounters errors:
&FSMOVE = SUCCESS | ERROR

Rename a SAS Forecast Server Project: FSREN Macro

The FSREN macro renames a SAS Forecast Server project.

Syntax

The FSREN macro has the following form:

%FSREN *(PROJECTNAME=, NEWPROJECTNAME=, USER=, PASSWORD=, DESCRIP-TION, ARCHIVEFOLDER [, options])* **;**

Required Arguments

The following arguments must be used with the FSREN macro. The required arguments are separated by commas.

PROJECTNAME= *project-name*
> specifies the name of the SAS Forecast Server project. The name must be a valid SAS name.

NEWPROJECTNAME= *project-name*
> specifies the new name of the SAS Forecast Server project. The name must be a valid SAS name.

USER= *username*
> specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*
> specifies the user password that you use to log on to SAS Forecast Studio.

ARCHIVEFOLDER= *project-name*
> specifies the folder on WORKSPACESERVER= where the archived projects are saved (e.g. `c:\SAS\ForecastStudio\Archives`.

Options

The following options can be used with the FSREN macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*
> specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*
> specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

NOWARN= *YES | NO*

    specifies whether to suppress errors if the SAS Forecast Server project does not exist. The default is NOWARN=NO.

TMPARCHIVENAME= *value*

    specifies the name of the temporary archived project. The default is _fs_tmp_archive. The name must not match an existing archive.

DESCRIPTION= *text*

    specifies the project archive description.

Example

```
%fsren(projectname=prdat3,
       newprojectname=prdat4,
       description=new name,
       user=sasuser,
       password=saspass,
       archivepath=C:/SAS/ForecastStudio/Archives
       ) ;
```

Results

The FSREN global macro variable indicates whether the FSREN macro finishes successfully or encounters errors:

&FSREN = SUCCESS | ERROR

Open and Run a Project at a Given Stage: FSRUNPRJ Macro

The FSRUNPRJ macro opens an existing SAS Forecast Server project, and runs the project at a given stage.

Syntax

The FSRUNPRJ macro has the following form:

    %FSRUNPRJ *(PROJECTNAME=, USER=, PASSWORD=, METHOD=, [, options])* **;**

Required Arguments

The following arguments must be used with the FSRUNPRJ macro. The required arguments are separated by commas.

PROJECTNAME= *project-name*

>   specifies the name of the SAS Forecast Server project. The name must be a valid SAS name.

USER= *username*

>   specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*

>   specifies the user password that you use to log on to SAS Forecast Studio.

METHOD= *method-name*

>   specifies the run method.

>   Valid values are the following:
>   CREATE | DESTRUCTIVE-DIAGNOSE | DIAGNOSE | SELECT | FIT |FORECAST | REC-
>   ONCILE | OVERRIDES | CURRENT

Options

The following options can be used with the FSRUNPRJ macro. Options must follow the required
arguments and are separated by commas.

IMPORTDATA= *YES | TRUE | NO | FALSE*

>   specifies whether new data should be imported from the input data set. The default value is
>   NO.

HOST= *host:port*

>   specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is
>   localhost:5099.

WORKSPACE= *workspace-server-name*

>   specifies the name of the SAS Workspace Server to use. It is required only if there are multiple
>   workspace servers defined in the metadata server.

Example

```
%fsrunprj(projectname=pd1,
      user=sasuser,
      password=saspass,
      host=localhost:5099,
      method=FORECAST,
      importdata=NO
      ) ;
```

Results

The FSRUNPRJ global macro variable indicates whether the FSRUNPRJ macro finishes success-
fully or encounters errors:

&FSRUNPRJ = SUCCESS | ERROR

In addition, there are a series of global macro variables that are populated after a SAS Forecast Server project is loaded. These macro variables describe the project, and enable additional SAS code to be written in a generic manner in order to use and explore the data that are contained in a SAS Forecast Server project. These macro variables are available to stored process programs. For more information about the macro varaibles, see Chapter 12, "Administration Tasks."

Assign the Name of a Project Creator: FSSETCRB Macro

The FSSETCRB macro assigns the creator of a SAS Forecast Server project.

Syntax

The FSSETCRB macro has the following form:

%FSSETCRB *(PROJECT=, CREATEDBY=, USER=, PASSWORD= [, options])* **;**

Required Arguments

The following arguments must be used with the FSSETCRB macro. The required arguments are separated by commas.

PROJECT= *project-name*
    specifies the name of the SAS Forecast Server project. The name must be a valid SAS name.

CREATEDBY= *username*
    specifies the user name to be assigned ownership of the SAS Forecast Server project.

USER= *username*
    specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*
    specifies the user password that you use to log on to SAS Forecast Studio.

Options

The following options can be used with the FSSETCRB macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*
    specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*
> specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

Example

```
%fssetcrb(project=Project3,
         createdBy=sastrust,
         user=sasadm,
         password=sasadmpass,
         workspace=SASMain
         ) ;
```

Results

The FSSETCRB global macro variable indicates whether the FSSETCRB macro finishes successfully or encounters errors:
&FSSETCRB = SUCCESS | ERROR

NOTE: If the FSSETCRB macro is used on a project created with an older version of SAS Forecast Server, then the project is converted to the current version.

Change the Default Location for Projects: FSSETLOC Macro

The FSSETLOC macro changes the default location for SAS Forecast Server projects.

Syntax

The FSSETLOC macro has the following form:

> **%FSSETLOC** *(LOCATION=, USER=, PASSWORD= [, options])* **;**

Required Arguments

The following arguments must be used with the FSSETLOC macro. The required arguments are separated by commas.

LOCATION= *n*
> specifies the location of the projects.

USER= *username*
> specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*
> specifies the user password that you use to log on to SAS Forecast Studio.

Options

The following options can be used with the FSSETLOC macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*

> specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*

> specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

Example

```
fssetloc(location=c:\myprojects,
         user=sasuser,
         password=sasuserpass,
         );
```

Results

The FSSETLOC global macro variable whether the FSSETLOC macro finishes successfully or encounters errors:
&FSSETLOC = SUCCESS | ERROR

Enable Public Access: FSSETPUB Macro

The FSSETPUB macro enables public access to a SAS Forecast Server project.

Syntax

The FSSETPUB macro has the following form:

> **%FSSETPUB** *(PROJECT=, ISPUBLIC=, USER=, PASSWORD= [, options])* **;**

Required Arguments

The following arguments must be used with the FSSETPUB macro. The required arguments are separated by commas.

PROJECT= *project-name*

> specifies the name of the SAS Forecast Server project. The name must be a valid SAS name.

ISPUBLIC= *YES|NO*
>
> specifies if the project should have public access.

USER= *username*
>
> specifies the user name that you use to log on to SAS Forecast Studio.

PASSWORD= *password*
>
> specifies the user password that you use to log on to SAS Forecast Studio.

Options

The following options can be used with the FSSETPUB macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*
>
> specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*
>
> specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

Example

```
%fssetpub(project=Project3,
         ispublic=YES,
         user=sasadm,
         password=sasadmpass,
         workspace=SASMain
         ) ;
```

Results

The FSSETPUB global macro variable indicates whether the FSSETPUB macro finishes successfully or encounters errors:
&FSSETPUB = SUCCESS | ERROR

NOTE: If the FSSETPUB macro is used on a project created with an older version of SAS Forecast Server, then the project is converted to the current version.

Unregister a Project from the SAS Metadata Server: FSUNREG Macro

The FSUNREG macro unregisters an existing SAS Forecast Server project from the metadata server. The project files will not be deleted from the disk.

NOTE: Only an administrative user can deploy this macro.

Syntax

The FSUNREG macro has the following form:

%FSUNREG *(PROJECTNAME=, PASSWORD= [, options])* **;**

Required Arguments

The following arguments must be used with the FSUNREG macro. The required arguments are separated by commas.

PROJECTNAME= *project-name*
> specifies the name of the SAS Forecast Server project. The name must be a valid SAS name.

USER= *username*
> specifies the user name that you use to log on to SAS Forecast Studio. The user must be a SAS administrator.

PASSWORD= *password*
> specifies the user password that you use to log on to SAS Forecast Studio.

Options

The following options can be used with the FSUNREG macro. Options must follow the required arguments and are separated by commas.

HOST= *host:port*
> specifies the host and port number of the SAS Forecast Server Mid-Tier. The default is localhost:5099.

WORKSPACE= *workspace-server-name*
> specifies the name of the SAS Workspace Server to use. It is required only if there are multiple workspace servers defined in the metadata server.

Example

```
%fsunreg(projectname=prdat2,
        user=sasadm,
        password=sasadmpass
        );
```

Results

The FSUNREG global macro variable indicates whether the FSUNREG macro finishes successfully or encounters errors:
&FSUNREG = SUCCESS | ERROR

Examples: Forecast Server Batch Macros

Example 13.1: Separate Middle Tiers Migration of SAS Forecast Server 1.4 Projects to SAS Forecast Server 2.1

In this example you migrate all projects created with Forecast Server 1.4 to a Forecast Server 2.1 Mid-Tier host installation on a separate machine. Both Mid-Tier hosts are running Microsoft Windows. The installation directories are the default for all SAS products. Assume that the name of the machine hosting Forecast Server 1.4 Mid-Tier is **fs14**, and the name of the machine hosting Forecast Server 2.1 Mid-Tier is **fs21**. The project archive folder on **fs14** is `c:\SAS\ForecastStudio\Archives\`. The same folder can be accessed on **fs21** using the following path `\\fs14\SAS\ForecastStudio\Archives\`. The SAS administrator user ID is **sasadm** on both machines, and its password is **sasadmpass**.

You can follow these steps:

1. Set up both servers to use the SAS Forecast Server batch macros, if not done already.

   - Copy the *fsexp14.sas* file from `c:\Program Files\SAS\SAS 9.1\forecastmva\sasmacro` on **fs21** to `c:\Program Files\SAS\SAS 9.1\hpf\sasmacro` on **fs14**.

   - On both **fs14** and **fs21**, copy the sas.forecasting-remote.jar file from your SAS Forecast Server installation path `c:\Program Files\SAS\SASAPCore\apps\Forecasting\lib` to the SAS core misc area, `c:\Program Files\SAS\SAS 9.1\core\sasmisc`.

   - Copy the sas.apps.session.jar file from the SAS Analytics Platform Server installation path `c:\Program Files\SAS\SASAPCore\lib` to the SAS core misc area `c:\Program Files\SAS\SAS 9.1\core\sasmisc`.

2. Archive the projects on **fs14**

   - Open SAS in Display Manager mode on **fs14**.
   - Define the library where the OUT= data set is written. The library must be accessible by both hosts. In this example, you use the Archive folder on **fs14**

     ```
     libname migrate 'C:\SAS\ForecastStudio\Archives\';
     ```

   - Run the macro for exporting all projects by submitting the following SAS code.

     ```
     %fsexp14(
        out=migrate.projects,
        user=sasadm,
        password=sasadmpass,
        forecastingRemotePath=
        C:\Program Files\SAS\SAS 9.1\core\sasmisc\sas.forecasting-remote.jar,
     ```

```
                  host=localhost:5099,
                  nameSuffix=_fs_export14,
                  keepLog=1,
                  logFileFolder=c:\temp
                  );
```

The macro spawns shell windows whose purpose is to archive the projects. The *java.exe* executable must be in the search path of the OS. The NAMESUFFIX= parameter must be such that it makes the archive names unique. If an archive with the same name exists already, then the archiving process fails for that project. The KEEPLOG=1 parameter instructs to keep a log file for each project. The log files are kept in the folder specified in the LOGFILEFOLDER= parameter. By default, when KEEPLOG=0, only the log file for projects that failed is kept. If one project fails to archive, you might be required to type **exit** at the shell prompt to continue the process.

3. Import all projects to **fs21**

   - Open SAS in Display Manager mode on **fs21**
   - Define the library where the data set containing the PROJECTDS= data set is contained.

     ```
     libname migrate '\\fs14\SAS\ForecastStudio\Archives\';
     ```

   - Run the macro for importing all projects. This macro creates the project data folders and registers the projects with the SAS Metadata Server.
     ```
     %fsimpall(projectds=migrate.projects,
               archiveFolder=\\fs14\SAS\ForecastStudio\Archives,
               user=sasadm,
               password=sasadmpass,
               host=localhost:5099,
               );
     ```

   The %FSIMPALL macro automatically migrates the projects to the current version of SAS Forecast Server.

Example 13.2: In-place Migration of SAS Forecast Server 1.4 Projects to SAS Forecast Server 2.1

If you upgraded the SAS Forecast Server Mid Tier on the current machine to SAS Forecast Server 2.1, and want to migrate in batch all the projects that are currently registered with the SAS Metadata Server, then you can use the FSMIGALL macro. Alternatively, you can use the FSMIGPRJ macro to migrate one project at a time. If you do not migrate the projects, then the first time you open a project in the SAS Forecast Studio client, you are given the option to migrate the project.

To use the FSMIGALL macro, perform the following steps:

1. Open SAS in Display Manager mode on a SAS server machine.

2. Run the macro for migrating all projects by submitting the following SAS code:

```
%fsmigall(out=work.migration,
          user=sasadm,
          password=sasadmpass,
          workspace=SASMain,
          host=localhost:5099
          ) ;
```

3. Check the ISMIGRATED variable in the work.migration data set to verify that all projects have been successfully migrated.

For information about the arguments used in the FSMIGALL macro, see

Example 13.3: Create a SAS Forecast Server Project

In this example, you create a SAS Forecast Server project by using SAS code instead of the SAS Forecast Studio client. You will use the SASHELP.PRICEDATA data set to create a hierarchical project whose levels are defined by the variables regionName, productLine, and ProductName. The variable date is the time ID variable. You want to model the total sale as a function of price and discount, while using price1-price3 as reporting variables. The project is reconciled in a middle-out fashion starting from the productLine level, and the disaggregation method is "equal split of the difference". You accept the default values for all other project creation options.

You use the sasguest user ID to create the project, but you want it to have public access so that other users can open it and modify it.

To use the FSCREATE macro, perform the following steps:

1. Open SAS in Display Manager mode on a SAS server machine.

2. Run the macro for creating a project by submitting the following SAS code:

```
%fscreate(projectname=mypricedataprj,
          user=sasguest,
          password=Password1,
          workspace=SASMain,
          data=sashelp.pricedata,
          id=date,
          by=regionName productLine productName,
          hierarchy=YES,
          var=sale,
          input=price discount,
          reporting=price1 price2 price3,
          aggregate=NONE total(sale),
          disaggregation=EQUALSPLIT,
          reconciliation=YES,
          publicaccess=YES,
          );
```

For information about the arguments used in the FSCREATE macro, see "Create a New Project in Batch Mode: FSCREATE Macro" on page 160.

Example 13.4: Archive a SAS Forecast Server Project

In this example, you export a SAS Forecast Server project pd1 to an archive file by using the FSEX-PORT macro in a SAS session. You name the archive `ArchPD1`, and describe as "Project pd1". You have only one SAS Workspace Server, and the middle-tier server is the local machine; therefore, you do not need to specify the WORKSPACE= and HOST= parameters. To use the FSEXPORT macro, perform the following steps:

1. Open SAS in Display Manager mode on a SAS server machine.

2. Run the macro for exporting a project by submitting the following SAS code:

```
%fsexport( projectname=pd1,
        archiveName=ArchPD1,
        description=Project pd1,
        user=sasuser,
        password=saspass
        );
```

For information about the arguments used in the FS EXPORT macro, see "Archive a Single Project: FSEXPORT Macro" on page 174.

Chapter 14

Troubleshooting SAS Forecast Server

Contents

Gathering Information

Overview

When you are troubleshooting unexpected application behavior, it is important to isolate the problem and gather all the pertinent information about the unexpected behavior. The following are the general classes of information that can expedite resolution of a technical problem:

- environmental and configuration information

- detailed problem description

- log files

- other files or screen shots

- sample test data

You can use Table 14.1 to help you gather as much information as possible, so that SAS Technical Support will be better able to reproduce and fix your problem.

Table 14.1   Information Gathering Checklist

Task	Done
Does SAS Technical Support have the details of your operating environment?	[ ]
Have you provided a detailed description of the problem, including what it takes to reproduce the problem?	[ ]
Have you provided any sample data that would help reproduce the problem?	[ ]
Have you captured all the log files?	[ ]
Have you provided the full Java stack trace from the error page?	[ ]

Environmental and Configuration Information

If you request help from SAS Technical Support, then providing the following information about your installation can result in faster resolution of the problem:

- a copy of the SAS Forecast Server configuration files:
  Windows: **SAS_HOME\SASAPCore\apps\Forecasting\app.config**
  UNIX: **SAS_HOME/SASAPCore/apps/Forecasting/app.config**

- hardware platform, operating environment (including SAS version and SAS service pack/patch level), amount of physical memory, and number of processors

- JDK version

- application server version number and patch level

- application server command line parameters

- application server startup script
  Windows:
  SAS_HOME\SASAPCore\apps\Forecasting\bin\ForecastStudioSetup.bat
  UNIX:
  SAS_HOME/SASAPCore/apps/Forecasting/bin/ForecastStudioSetup.sh

- SAS Forecast Server version number and patch level

- JDBC driver

- server language and locale

NOTE: You must provide the preceding information only once, unless it has changed from previous reports.

Problem Description

Provide a scenario description that includes as much information as possible. Include a description of the general task that you are trying to accomplish, your role and permissions, and what has happened during the session. Provide details such as the following:

- Are you working with new data or updating existing data?

- How easy is the problem to reproduce?

- What browser and version are you using?

- Is the problem locale-specific? If so, which locales are having problems?

Sample Test Data

If possible, capture the information entered that caused the problem. In certain situations, SAS Technical Support might request your data load files so that they can better replicate your operating environment.

Log Files

When you are troubleshooting unexpected behavior in SAS Forecast Server, you can use the log files written by the SAS System. Typically, the system log files contain important data for diagnosing any problems. If you need to contact SAS Technical Support, then you should provide the system log to assist the staff in resolving the problem.

If you have problems connecting to the SAS server, then turning on the SAS log might help you. To view the SAS log, perform the following steps:

1. Click on SAS → Options → Results tab.

2. Check **Show SAS log**.

Java Stack Traces and Screen Shots

SAS Forecast Server attempts to catch and log any problem and route you to the application error page, where the detailed exception information can be captured and sent to SAS Technical Support. It can be very helpful if you copy and send the Java stack trace in the error page.

NOTE: The complete text of the Java stack trace is preferable to a screen shot of the error page, which often does not include the full Java stack trace.

Screen shots of the page or sequence of pages that precede the error can be quite helpful. If possible, capture the screen shots and send them with the Java stack traces to SAS Technical Support.

Cannot Log On to the SAS Forecast Studio Client

Problem:
If you cannot log on to the SAS Forecast Studio client, then there might be a problem with the SAS Analytics Platform Server.

Error:
You can get multiple errors when attempting to log on to a SAS Forecast Studio client. You can encounter the following types of logon states:

- No new user can log on to a SAS Forecast Studio client.

- You could log on to a SAS Forecast Studio client yesterday, but you cannot log on today.

- Some users can log on to a SAS Forecast Studio client, but other users cannot log on.

Solution:
Because the SAS Analytics Platform Server starts the SAS Forecast Server Middle-Tier, you should review the SAS Analytics Platform Server documentation for possible remedies. You can access the SAS Analytics Platform Server documentation by selecting SAS Analytics Platform Server as your product at the following Web address:
http://support.sas.com/documentation/onlinedoc/index.html

SASGUEST Cannot Log On to the SAS Forecast Studio Client

Problem:
User manager profile identity is incorrect. The sasguest user ID cannot log on from the application.

Error Message:

```
2004-11-23 16:40:52,111 [RMI TCP Connection(4)-10.28.11.224]
INFO  com.sas.apps.session.AppServerImpl -
com.sas.services.user.UserInitializationException:com.sas.services.
ServiceException: User SAS Guest is not connected to correct profile repository
(omi://<host1>.<domain>.com:8561) for application global.

2004-11-23 16:40:52,127 [RMI TCP Connection(4)-10.28.11.224]
INFO  com.sas.apps.session.AppServerImpl - Failed to log in userid sasguest
```

Solution:
The first time the SAS Analytics Platform Server is connected to the metadata server, the SAS Analytics Platform Server tries to open the Foundation Services deployment. If there is none, it will add one.

If you log on to the client before defining a three-tier configuration, then the deployment records that you are trying to authenticate based on a profile that is defined in the User Services section of the deployment that specifies "omi://localhost:8561" as the address of the metadata server OMI profile. To change the profile, perform the following steps:

1. Verify the configuration of the login.config file. The entry in AP/conf/login.config file depends on the previous installation of the metadata server.

   Example: PFS com.sas.services.security.login.OMILoginModule optional-host="D8359.na.sas.com"

   If the default value for host is *localhost*, then the host specifications do not match and SAS Forecast Studio will not work.

   On a machine where the metadata server is already installed and you used the default host as *localhost*, specify the following machine address:

   host="localhost"

   NOTE: If you continue to have a problem, then you might want to try the host=*host1.domain.com* setting to see which host address works for your configuration.

2. If you change the SAS Analytics Platform Server configuration later to be an actual network address like *host1.domain.com*, then you need to change the deployment profile because the BI authentication cannot know that *host1.domain.com* is *localhost*. To change the profile, perform the following steps:

   a) Launch SAS Management Console.

b) Expand **Foundation Services Manager**.

c) Expand **SAS Forecast Studio - Foundation Services** fully.

d) Right-click **User Services** and select **Properties**.

e) Select the **Service Configuration** tab and click **Edit Configuration**.

f) Select the **Profiles** tab.

g) Select the **global** profile and click **Edit**.

h) Change the machine name in the **Domain URL** field from *omi://localhost:8561* to *omi://host1.domain.com:8561* or whatever your machine name is. The default value for host is *localhost*, and this value does not work unless it is modified.

i) Click **OK** until the configuration is complete.

Cannot Launch SAS Forecast Studio from the SAS Analytics Platform Server Web Page

Problem:
After you click **Launch for Forecasting** on the SAS Analytics Platform Server Web page, the SAS Forecast Studio client does not launch. Instead, an XML file appears in the Internet Explorer window.

Error Message:
The following errors are observed in the SAS Analytics Platform Server Server window:

2005-08-30 15:17:43,796 [Thread-10] ERROR com.sas.analytics.forecasting.webapp.JNLPProvider - File sas.graph.nld.jar not found.

2005-08-30 15:17:43,796 [Thread-10] ERROR com.sas.analytics.forecasting.webapp.JNLPProvider - File sas.sg.datadef.jar not found.

2005-08-30 15:17:43,796 [Thread-10] ERROR com.sas.analytics.forecasting.webapp.JNLPProvider - File sas.sg.dataimpl.jar not found.

2005-08-30 15:17:43,796 [Thread-10] ERROR com.sas.analytics.forecasting.webapp.JNLPProvider - File sas.graph.j2d.jar not found.

Solution:
If an XML file appears in your browser, then the Java Web Start feature is not available on your client machine because the required JRE version is not installed on the client machine. You receive a warning that the required JRE version is not installed, and you are asked to specify the location of the required JRE version. You must install the required version of JRE on the client machine in order for SAS Forecast Server Java Web Start to work.

For more information about SAS Forecast Server system requirements, see Chapter 3, "System Requirements for SAS Forecast Server."

For more information about Java Web Start, see the following Web site:
http://java.sun.com/products/javawebstart/

Cannot Access Libraries from a Newly Added Workspace Server

Problem:
You added another workspace server, and you cannot access the libraries from the newly added workspace server.

Error Message:
The message "Errors were found in the report" appears, and no report is generated.

Solution:
If you added a new workspace server for SAS Forecast Server, then the SAS Forecast Server projects must be stored in a location that is accessible to all workspace servers (that is, on a shared drive). Storing projects on the workspace server local file system results in configuration issues when using stored processes. You need to configure the server where the stored process executes.

Cannot Access a SAS Library from SAS Forecast Server

Problem:
From within SAS Forecast Server, your SAS library is not listed as a possible selection in order for you to access the data set that you want as input for your project.

Solution:
To enable SAS Forecast Server to read the input data set, use SAS Management Console to define a library that specifies the SAS libref, engine, and path of the input data set. Use the Data Library Manager Plug-in of SAS Management Console to define a library that is pre-assigned to a server or servers, and specify the location of the input data set. To specify a library as pre-assigned for a server or servers, perform the following steps:

1. Open SAS Management Console as the SAS Administrator (for example, sasadm), and connect to a metadata repository.

2. Expand the Data Library Manager node, and select **SAS Libraries**.

3. Right-click the library that you want to pre-assign, and select **Properties**.

4. Click the **Options** tab.

5. Click **Advanced Options**.

6. Select the **Library is pre-assigned** check box. This window is accessible from the Library Options window of the New Library Wizard when you create a new data library.

7. Ensure that the library is assigned to the correct SAS server(s). The selected library is assigned whenever one of the selected servers starts.

8. Click **OK**.

Incorrect Version of SAS Installed for SAS Forecast Server

Problem:

The version of SAS installed on your system is not suitable for the version of SAS Forecast Server being run. SAS Forecast Server executes a syntax check on SAS High-Performance Forecasting software. If the syntax check fails, indicating that the feature being checked is not present, then an exception is sent to the client. The client displays the following error message, and the SAS Forecast Studio client then closes automatically.

Error Message:

```
Forecast Studio requires a minimum of SAS version-number.  Please close
Forecast Studio and contact your system administrator.
```

Solution:

If you receive the preceding error message, then contact your SAS representative to inquire about updating your version of SAS.

NOTE: The client is installed in a SAS Forecast Studio 2.1 folder, so it is easy to determine the version number of the client. The middle tier does not have such a directory structure. To identify the version number of the middle tier, navigate to the **!SASROOT\SASAPCore\apps\Forecasting** directory and view the app.config file with a text editor. The following text line shows the version number of the SAS Forecast Server Middle-Tier:

```
application.version=2.1
```

Cannot Find Correct Java Version

Problem:

After you complete the installation of Service Pack 4, the apserver.sh script might not be able to find the correct Java version.

Error Message:

```
apserver[64]:
/projects/fs/installse20/SAS_9.1/sasjre/1.4.2/bin/java:
not found
```

Solution:

You might need to update the script to reflect the new JRE 1.4.2 path. To update the apserver.sh script, perform the following steps:

1. Navigate to the location of the apserver.sh script. By default, the path is the following:
   !SASROOT/SASAPCore/bin

2. Locate the following command lines in the script:
   ```
   # was $JAVACMD
   !SASROOT/sasjre/1.4.2/bin/java
   ```

3. Change the preceding lines to the following:
   # was $JAVACMD
   !SASROOT/sasjre/1.4.2/jre/bin/java

   NOTE: !SASROOT is the path where you installed SAS.

4. Save these changes to the apserver.sh file.

Cannot Determine Which Version of SAS Forecast Server Is Running

The client is installed in a SAS Forecast Studio 2.1 folder, so it is easy to determine the version number of the client. The middle tier does not have such a directory structure. To identify the version number of the middle tier, navigate to the **!SASROOT\SASAPCore\apps\Forecasting** directory (default installation directory) and view the app.config file with a text editor. The following highlighted text shows the version number of the SAS Forecast Server Middle-Tier:

```
application.version=2.1
application.build.date=2007.12.05
application.build.number=1
application.version.major=1
application.version.minor=3
application.remote.class=com.sas.analytics.forecasting.rmi.
RemoteForecastingApplicationRmiImpl
application.local.class=com.sas.analytics.forecasting.rmi.
ForecastingApplicationRmi
application.startup.class=com.sas.analytics.forecasting.
ForecastingApplicationInitializer
application.war=sas.forecasting.war
application.war.link=Y
application.jnlp=main.jnlp
```

If you need to reference the version number of the client, then the default location of the client is in the installation directory:

C:\Program Files\SAS\SASForecastStudio

The SAS Forecast Studio client application is installed in a folder named for its version number.

Java Version Missing for Java Web Start

Problem:
Java Web Start does not work because the required version of JRE is not installed on the client tier.

Error:
You get a message indicating that the required Java version 1.4.2_09 could not be found. The message is something like "Missing version field in response from server when accessing resource …" This is most likely due to the proxy settings for Web Start. Start the Java Web Start Application Manager, and try changing the proxy settings to either **Use Browser** or **None**.

Solution:
You must have JRE 1.4.2_09 installed on the client machine. You need to either install the required JRE version or configure Web Start to use the required version.

JRE 1.4.2_09 is used as the Web Start run-time version, which does not need to be the same version as Web Start itself. You can use J2SE 5.0 for Web Start and launch the SAS Forecast Studio client by using the SAS Private JRE 1.4.2_09. If you use different JRE versions, then Web Start must be configured to include the JRE 1.4.2_09 version. This can be done by using the Preferences menu option in the Java Web Start Application Manager.

There is no automatic installation available for JRE 1.4.2_09 from Sun. You must first install a JRE version that contains Web Start. This prevents you from using the SAS Private JRE, because it does not contain Web Start. It is recommended that you install either JRE 1.4.2_09 from Sun or the latest JRE available from Sun at the following Web address:

http://java.sun.com/products/archive/j2se/1.4.2_09/index.html

SAS Forecast Server System Performance Tuning

For scalability, slow system performance, or failures caused by memory settings, you can change the default settings for the SAS Forecast Studio client, SAS Analytics Platform Server server, and Java Web Start in the following tiers:

- SAS Forecast Studio client

- SAS Analytics Platform Server middle tier

- SAS server tier

You can change the Xmx value to 1g (1024m) from the default setting of 512m in the .ini files, and save the new settings. You can increase the JVM memory for the server, middle tier, and client to -Xmx1g by adding this option to the command line for Java.

The Windows default locations for the .ini files are as follows:

- Client (SAS Forecast Studio):
  SAS_HOME\SASForecastStudio\2.1\forecaststdo.ini
  SAS_HOME\SASAPCore\apps\Forecasting\sas.forecasting.war
  (web.xml file)

- Middle tier (SAS Analytics Platform Server):
  SAS_HOME\SASAPCore\bin\apserver.bat
  SAS_HOME\SASAPCore\bin\apstart.ini

- Server (SAS): (JRE variables)
  !SASROOT\nls\en\sasv9.cfg

For more information about changing your system settings to improve system performance, see the section about best practices for configuring the middle tier in the *Web Application Administration Guide* of the SAS Intelligence Platform documentation set:
http://support.sas.com/onlinedoc/913/docMainpage.jsp

Do Not Archive Files Larger Than 2GB

Due to a Java 1.4 issue (see **http://bugs.sun.com/bugdatabase/view_bug.do?bug_id=4795136**), do not archive files larger than 2GB.

When unarchiving a project archive that contains files larger than 2GB, the unarchive process does not complete. This problem occurs if any data set in the archive is larger than 2GB.

To workaround this issue:

1. Remove files larger than 2GB from the project/data specification directory, and place them in a temporary directory. Use PROC CPORT if necessary.

2. Archive the project.

3. Unarchive the project, and move the large files from your temporary directory to the new project directory. Use PROC CIMPORT if necessary.

Part V

Glossary

Glossary

accumulation
> either of two processes that are used to convert a time series. (1) Accumulation converts a time series that has no fixed interval into a time series that does have a fixed interval (such as hourly or monthly). (2) Accumulation converts a time series that has a fixed interval into a time series with a lower frequency time interval (such as hourly into daily). Accumulation combines data within the same time interval into a summary value for that time period.

aggregation
> the process of combining more than one time series to form a single series. Aggregation combines data within the same time interval. For example, you can aggregate data into a total or average.

aggregation statistic
> the mathematical operation used to combine forecasts across levels in the hierarchy. The reconciliation method that you choose determines the levels where the aggregation statistic is used. See also reconciliation method.

autocorrelation
> the correlation between observations at different lags in a time series. Autocorrelation coefficient values range from -1 to +1. When the autocorrelation coefficient value at a given lag is positive, the observations that are separated by that lag tend to move together.

autocorrelation function (ACF) plot
> a plot of the autocorrelation coefficients across different values of time lags. This plot enables you to determine whether seasonality exists in the time series.

backtrace
> See stack trace.

bottom-up method of reconciliation
> a reconciliation method that uses the forecasts at the lowest level of the hierarchy to adjust forecasts for the higher levels in the hierarchy. See also middle-out method of reconciliation, reconciliation method, top-down method of reconciliation.

confidence limits
> the upper and lower values of a confidence interval. There is a percentage of confidence (typically 95%) that the true value of the parameter being estimated lies within the interval.

disaggregation method
> a method that specifies how the forecasts in the lower level of the hierarchy are reconciled when the reconciliation method is top-down or middle-out. The disaggregation method can reconcile the forecasts in either of the following ways: (1) by using the proportion that each lower-level forecast contributes to the higher-level forecast; or (2) by splitting equally the difference between the higher-level forecast and the lower-level forecasts. See also middle-out method of reconciliation, top-down method of reconciliation.

dummy variable
> a numeric variable with a value of either 1 or 0. Dummy variables are used to indicate

whether or not unusual events occur. The variable takes the value of 1 during the event and 0 otherwise.

event

an incident that disrupts the normal flow of any process that generates the time series. Examples of events are holidays, retail promotions, and natural disasters.

Subject Index

Syntax Index

Your Turn

We welcome your feedback.

- If you have comments about this book, please send them to **yourturn@sas.com**. Include the full title and page numbers (if applicable).

- If you have comments about the software, please send them to **suggest@sas.com**.

SAS® Publishing delivers!

Whether you are new to the workforce or an experienced professional, you need to distinguish yourself in this rapidly changing and competitive job market. SAS® Publishing provides you with a wide range of resources to help you set yourself apart.

SAS® Press Series

Need to learn the basics? Struggling with a programming problem? You'll find the expert answers that you need in example-rich books from the SAS Press Series. Written by experienced SAS professionals from around the world, these books deliver real-world insights on a broad range of topics for all skill levels.

support.sas.com/saspress

SAS® Documentation

To successfully implement applications using SAS software, companies in every industry and on every continent all turn to the one source for accurate, timely, and reliable information—SAS documentation. We currently produce the following types of reference documentation: online help that is built into the software, tutorials that are integrated into the product, reference documentation delivered in HTML and PDF—free on the Web, and hard-copy books.

support.sas.com/publishing

SAS® Learning Edition 4.1

Get a workplace advantage, perform analytics in less time, and prepare for the SAS Base Programming exam and SAS Advanced Programming exam with SAS® Learning Edition 4.1. This inexpensive, intuitive personal learning version of SAS includes Base SAS® 9.1.3, SAS/STAT®, SAS/GRAPH®, SAS/QC®, SAS/ETS®, and SAS® Enterprise Guide® 4.1. Whether you are a professor, student, or business professional, this is a great way to learn SAS.

support.sas.com/LE

§sas | THE POWER TO KNOW®