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SAS® Forecasting 4.1 for SAP APO

Installation Guide

SAS® Documentation

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Contents

CHAPTER 1

Introduction

About This Document

This document covers the installation & configuration of SAS Forecasting for SAP APO.

How to Use This Book

In this chapter, an overview of the individual components and architecture of SAS Forecasting for SAP APO is provided.

In Chapter 2 —Installation Pre-requisites: System requirements and prerequisites are listed.

In Chapter 3 — Installing SAS Forecasting for SAP APO: the installation of SAS Forecasting for SAP APOAPO is explained step by step.

Chapter 4 — Post Installation Steps: explains how to configure the software and how to verify its installation.

Appendix 1 —SAS Forecasting for SAP APO Installation and Configuration Worksheets: should be completed prior to starting an installation so all necessary information that may be required during the installation is known and available.

Appendix 2—SAS Forecasting for SAP APO Installation Checklist: provides a quick reference of all installation steps to help guide installers through the necessary sequence of steps and for determining readiness to install the SAS Forecasting for SAP APO solution.

Other Reference Guides

In addition to this SAS Forecasting for SAP APO Installation Guide, there are two additional guides available:

1. SAS Forecasting for SAP APO Reference Guide: provides more details on solution components, technical objects and relevant logs that can be used for debugging problems.
2. SAS Forecasting for SAP APO Users Guide: provides detailed instructions for utilizing the features of the add-in menu.

Introduction to SAS Forecasting for SAP APO

Overview

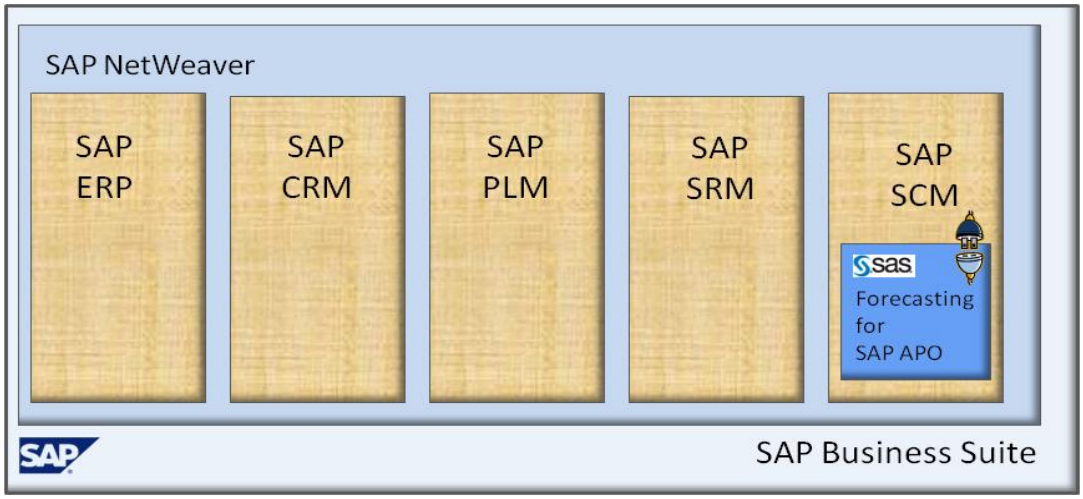
SAS Forecasting for SAP APO provides organizations ideal demand forecasting and planning by combining superior SAS forecasting with the strength of SAP Advanced Planning & Optimization (SAP APO) planning capabilities. The result is SAS' award-winning analytics "inside" APO Demand Planning (DP) for "On-Demand" statistical forecasts (providing an alternative to SAP's statistical forecast) to achieve:

- Improved forecast accuracy through an expanded set of forecasting models and SAS' ability to mathematically optimized parameters
- Enhanced scalability and improved performance allowing businesses to forecast at lower levels of their hierarchy
- Ease of use through simplified menus requiring less manual (user) intervention and knowledge in the step and creation of a statistical forecast
- Productivity enhancements for business planners through pre-built reports and ability to easily create custom reports
- What-if capabilities through the use of SAS Forecast Studio

This solution is also designed to meet the needs of businesses that have multiple user personas:

- Demand planners who need an easy to use interface that plugs into their current planning environment
- Professional forecasters who need and desire a more robust interface like SAS Forecast Studio which is capable of surfacing all the powerful forecasting features SAS provides.

SAS Forecasting for SAP APO seamlessly integrates with SAP-APO-DP through a SAS add-in to the SAP APO GUI. The add-in is used to call a SAS Web Service that reads history data from SAP LiveCache and writes the SAS statistical forecast back to SAP so that the results are displayed on the SAP APO Interactive Demand Planning transaction. SAP-APO-DP is a component of the SAP SCM (Supply Chain Management) Business Suite offering.



The SAP SCM offering is made up of the following components:

- SAP SPP: Service Parts Planning
- SAP EM: Event Manager
- SAP SNC: Supply Network Collaboration
- SAP F&R: Forecast & Replenishment Engine (Retail)
- SAP EWM: Extended Warehouse Management
- SAP APO: Advanced Planning and Optimization
  - Supply Chain Cockpit (SCC)
  - **Demand Planning (DP)**
  - Supply Network Planning and Deployment (SNP)
  - Production Planning and Detailed Scheduling (PP/DS)
  - Transportation Planning/Vehicle Scheduling (TPVS)
  - Global Available to Promise (ATP)

The add-in provided with the SAS Forecasting for SAP APO solution performs three primary functions:

1. **Forecast Options**: Allows a user to create or modify a forecasting profile with parameters that are utilized by the programming interface of SAS Forecast Server (SAS High Performance Forecasting also known as SAS/HPF) when generating the statistical forecast.
2. **Run Forecast**: Allows users to initiate creation of a statistical forecast using SAS. The SAS Forecasting Web Service is triggered to execute a stored process that executes the forecast on the SAS Server. The SAS stored process reads history values from SAP APO using a published SAP BAPI and the forecast results generated on the SAS Server are written back to SAP APO Live Cache also using a published SAP BAPI so that the results are visible by the user in the appropriate SAP Planning Book.
3. **Reports**: Allows users to view reports generated during the creation of the statistical forecast (HTML format) or allows users to view or create custom reports using SAS Web Report Studio.

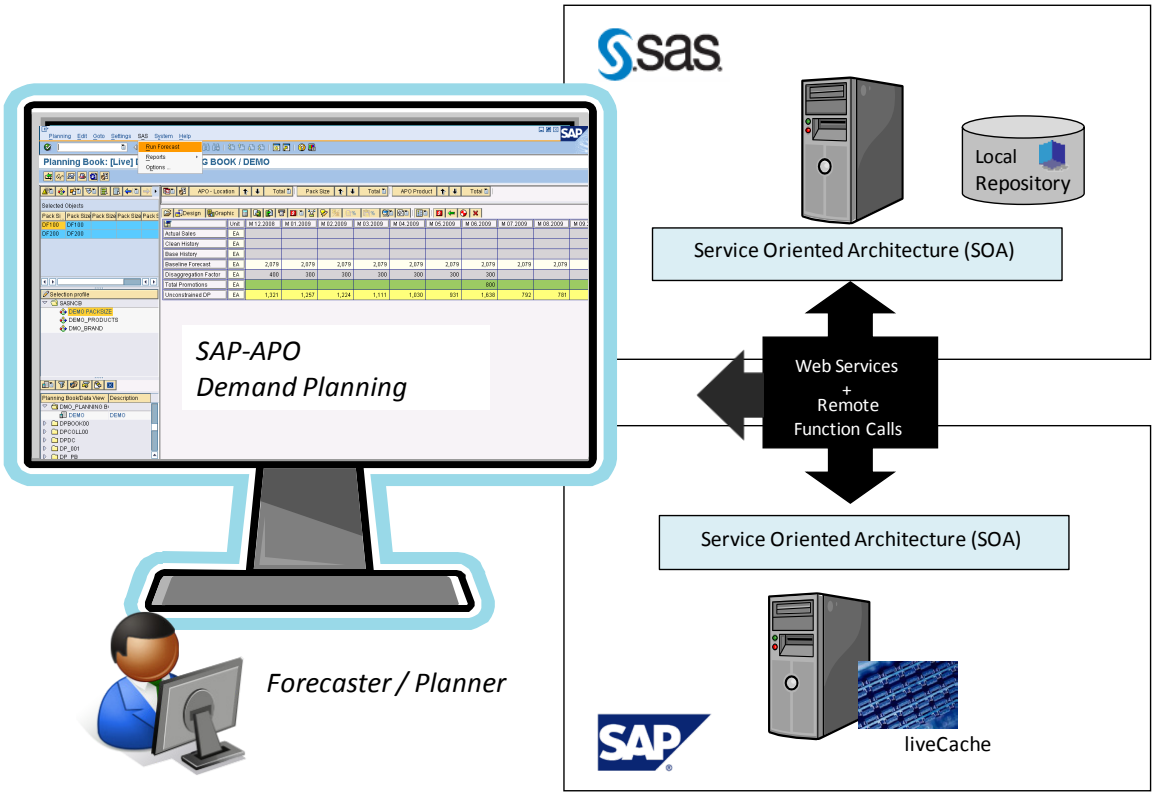
The SAS Forecasting for SAP APO solution provides many user changeable options but also allows installations to view and edit the Forecasting Stored Procedure and Web Service as needed to add to remove features.

Architecture

SAS Forecasting for SAP APO facilitates the data flow from SAP APO liveCache into a format (time series) that is acceptable by SAS Forecasting Server.

The figure below details the basic architecture of this data flow.

Figure 1: Basic Architecture: SAS Forecasting for SAP APO



From the SAS Forecasting Add-in menu, SAS Forecasting is triggered using a web service. On the SAS Server, this web service is implemented as a stored procedure. The SAS stored procedure:

1. Reads forecasting options specified using the “options” add-in menu
2. Extracts requested data from SAP liveCache (using SAP BAPI through Remote Function Calls - RFC)
3. Formats liveCache data into time series format
4. Evaluates time series data (Diagnosis) and selects candidate list of forecast models (if this option is selected)
5. Produces html (reports) based on output of Diagnosis (if this option is selected)
6. Produces Statistical Forecast
7. Produces html (reports) based on output of Forecast (if this option is selected)

8 Formats output of SAS forecast for write back to liveCache

9 Writes data to liveCache (using SAP BAPI through Remote Function Calls – RFC)

When the stored procedure has completed all steps, the user is notified in SAP APO that the forecast has been successfully created and the SAS forecast result appears in the appropriate Planning Book.

Components

SAS Forecasting for SAP APO is a software bundle which includes:

- SAS BI Server 9.3
- SAS Data Integration Server 9.3
- SAS Forecast Server 4.1
- SAS Data Surveyor for SAP 4.3
- One SAS/ACCESS engine of choice
- SAS Enterprise Guide (unlimited users within scope limitation)

In addition to the software bundle, the solution also includes the following solution components:

- SAS Add-in Menu for SAP APO
- SAP Proxy Object & Logical Port on SAP APO
- SAS Forecasting Web Service on HPF Server

SAS Add-in Menu for SAP APO

The SAS Add-in Menu provides a pull-down menu interface that allows a user to request the SAS Forecasting Web Service from the SAP APO Interactive Demand Planning Transaction. This component is coded in SAP Standard Business Add-in (BAdI). This BAdI is used to manage the SAS Forecasting profile. This menu also initiates the Reports generated by HPF Server and SAS Web Report Studio.

SAP Proxy Object & Logical Port on SAP APO

The SAP Proxy Object is used to consume the Web Service deployed on SAS Server. This Proxy object is being called in the BAdI. Logical Port is defined for the Proxy class which communicates with the SAS Server on which the Web Service has been deployed.

SAS Forecasting Web Service

The SAS Forecasting Web Service executes on the SAS Server and extracts the Historical data using SAP Standard BAPI based on the parameters defined in the SAS Forecasting Profile in SAP APO. The Web Service transforms the SAP Historical data into time series format and writes back the forecasted results into SAP LiveCache.

SAP Technical components Naming Conventions

Included with the solution components mentioned above, SAS Forecasting for SAP APO also provides SAP Technical objects like transparent tables, Data Elements, Domains & Search helps. These items are organized in the SAP APO with the appropriate naming conventions.

The technical object names provided by this SAS solution begin with the text '/SAS/'. This naming structure is for easy identification of all the SAS Technical Objects installed in SAP APO system.

The naming conventions of different technical objects are as given below (Figure 2).

Figure 2. Naming conventions

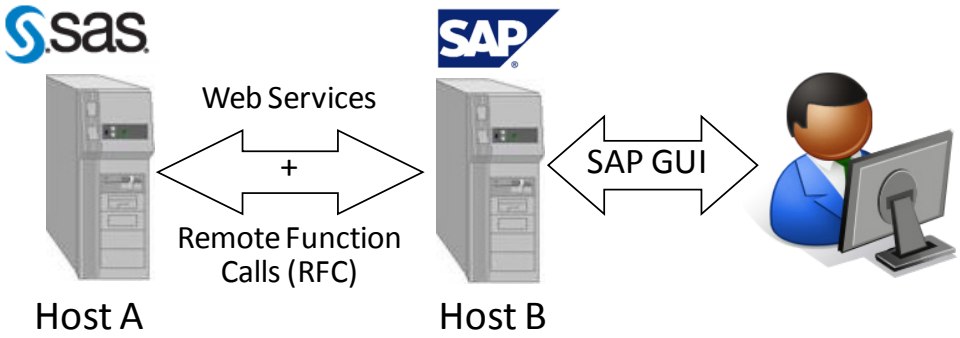
Technical Object	Naming Prefix
Transparent Table	/SAS/APOT_
Data Element	/SAS/APODE_
Domain	/SAS/APODOM_
Search Help	/SAS/APOSH_

Configuration

SAS Forecasting for SAP APO is configured for triggering the forecasting process to be run on the SAS HPF Server.

Figure 3 illustrates the basic configuration for SAS Forecasting for SAP APO where all the SAS components are installed on the SAS host whereas SAP BAdI, Proxy Object & Logical Port are on the same host as the SAP APO Application Server.

Figure 3: Basic Configuration of SAS Forecasting for SAP APO



If a basic configuration cannot be used, other configurations are available. In general, the recommendation is to use as few machines as possible to minimize network traffic and offer better system performance. Based on additional work load, installations may choose to install various SAS components (i.e. SAS Metadata Server) on separate physical servers.

CHAPTER 2

Installation Prerequisites

Overview

This chapter outlines the prerequisites to install and run SAS Forecasting for SAP APO. Some of these prerequisites require the involvement of other staff, such as the SAP system administrator.

System Requirements

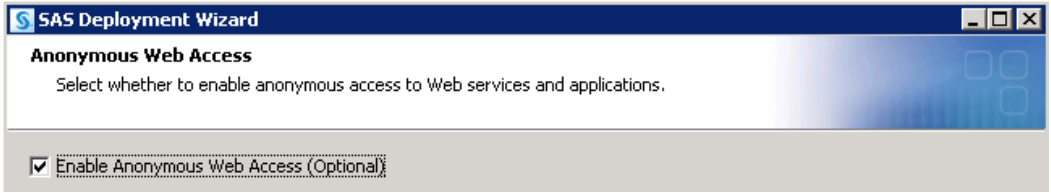
The installer requires operating system user IDs and passwords and SAP user IDs and passwords. For SAS multi-machine installation, appropriate access to the network and all machines must be included. For Windows NT, administrator privilege is required.

Required SAS Products

Following SAS products much be installed with SAS Forecasting for SAP APOAPO.

- SAS BI Server 9.3
- SAS Data Integration Server 9.3
- SAS Forecast Server 4.1
- SAS Data Surveyor for SAP 4.3 (includes SAS/Access to R/3)
- SAS Enterprise Guide

During installation, make sure to enable Anonymous Web Access.



Refer to the installation instructions of the specific product for further information.

Part of the installation activities for SAS Data Surveyor for SAP 4.3 includes installing transport files on the SAP APO system. This is detailed in the Post-Installation Instructions for SAS/Access 4.3 Interface to R/3. Here are some recommendations on which transport files should be installed when only considering accessing the SAP APO system with SAS Forecasting for SAP APO solution.

Must have:

- SAPKA93130INSAS

May need (depending on whether SAS will be utilized to access BW objects on the SAP APO system:

- SAPKB93030INSAS (only if accessing infoCubes and DSO with the Data Surveyor for SAP)
- SAPKB93031INSAS (only if the BI 7 authorizations are used)

May not need:

- SAPKA93031INSAS
- SAPKA93032INSAS
- SAPKH93030INSAS

SAP Supported Releases

- SAP SCM 4.1 or higher

SAPGUI Supported Releases

- SAP SCM GUI 6.40 or higher

User IDs

The user IDs must have appropriate authorizations to access data and use communication methods. See “Authorization Profiles” section in the SAS ACCESS Installation Guide for more information about customizing the authorization.

To install and run SAS Forecasting for SAP APO, the following SAP user IDs are required:

- **RFC user —** This is a SAP user ID that is used by SAS ACCESS & Data Surveyor for the communication link between the SAS RFC Server and the SAP System Application Server. Typically, there are several RFC user IDs (one per person).
- **SAP System Administrator —** For the installation of SAP programs and function modules, for the configuration of Logical Port, RFC destinations and variant for batch operations, and for setting up authorizations for user IDs to use the SAS/ACCESS Interface to R/3 software, a SAP System Administrator ID is required. This user ID is only used for the installation.

Configuration of Data Surveyor on SAS Server

Configurations in SAS Management Console

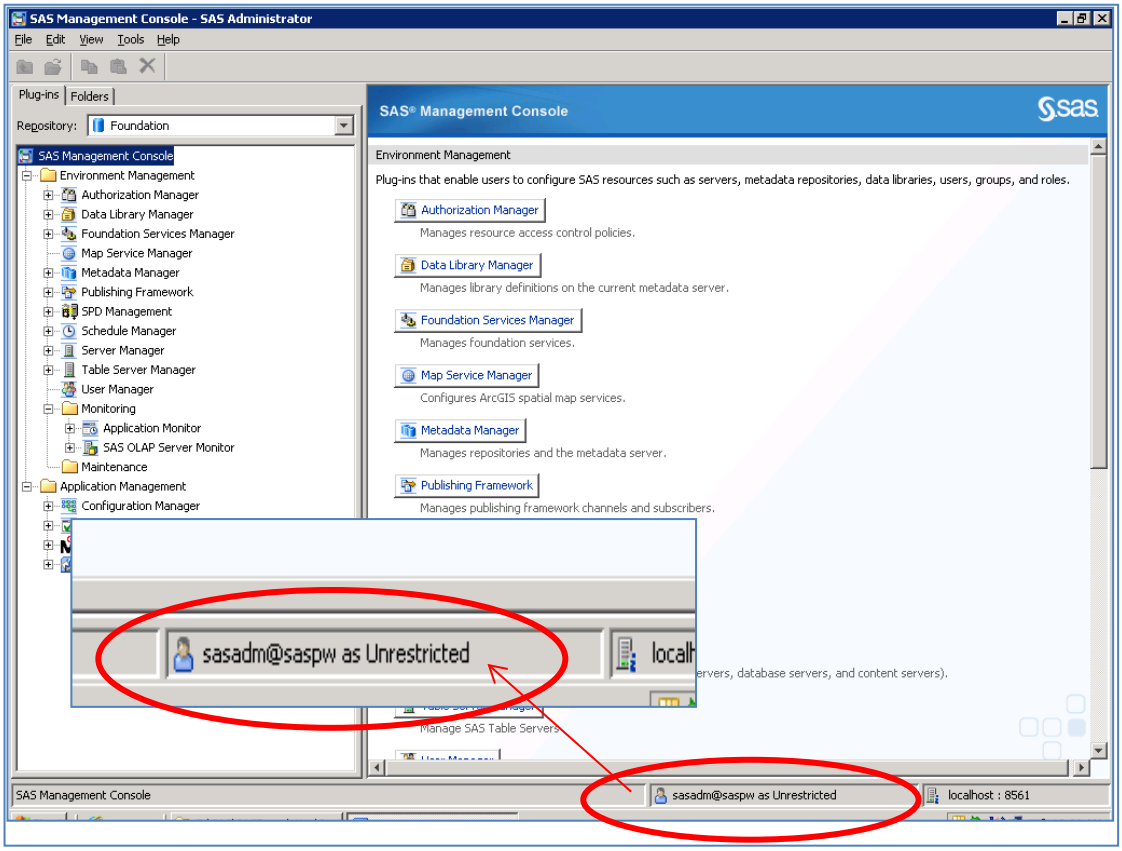
During post-installation various resources, servers and metadata must be configured in SAS Management Console.

Define a User

To define a user for the SAS Solutions Adapter for SAP:

1 Open SAS Management Console with the Administrator Connection profile. In the metadata connection profile, select the appropriate Project (Figure 4).

Figure 4. SAS Management Console – Administrator Profile

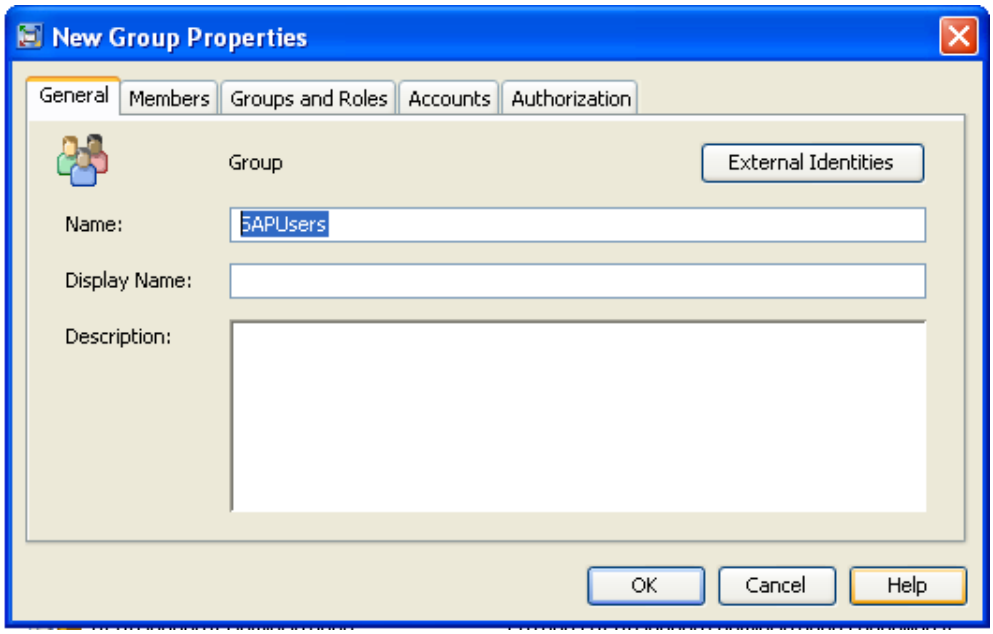


2 Select **Foundation** in the **Repository** field to connect to the metadata server at the foundation level. You must have administrator access to complete this task.

3 In the left pane of SAS Management Console, right-click **User Manager** and from the pop-up menu, select **New ▶ Group**. The New Group Properties dialog box opens.

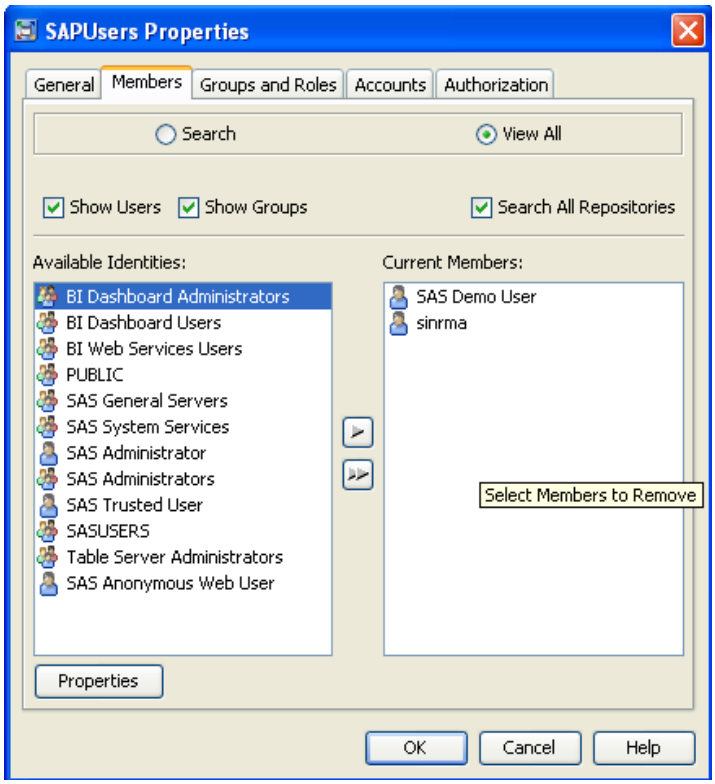
In the **Name** field, type SAPUsers (or a group name of your choice) and then select the **Members** tab (Figure 5).

Figure 5. New User Group Properties



4 In the **Available Identities** list, select the users who will need to access the SAP Server (**SAS Demo User or SINRMA as illustrated in Figure 6)** and move the selection to the **Current Members** list.

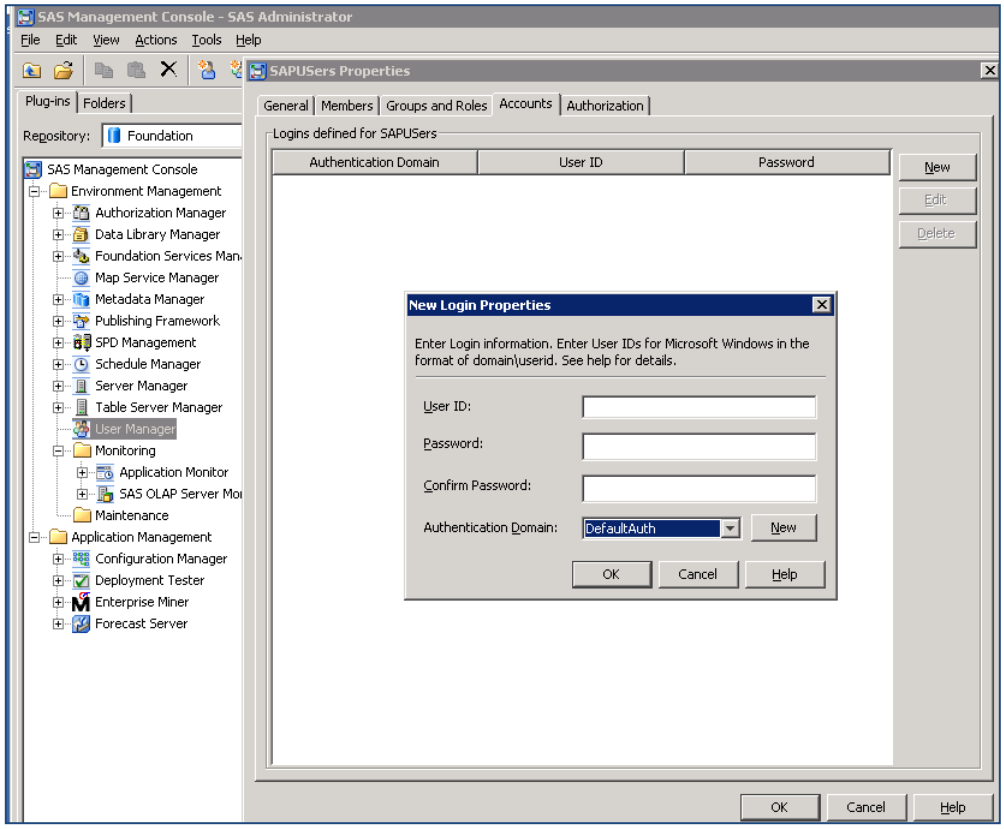
Figure 6. SAPUsers Properties



5 Select the **Accounts** tab (Figure 6).

6 Click **New**. The New Login Properties dialog box opens (Figure 7).

Figure 7. New Login Properties



7 In the New Login Properties dialog box:

   a Enter the user ID for the SAP server that will be used by the SAS Web Service.

   b Enter the password for the User ID.

   c Select **SAPAuth** from the **Authentication Domain** menu. If this option is not already available on the menu, click **New**, enter **SAPAuth** as the name of the new authentication domain, and then enter a short description. Click **OK** to save the new authentication domain.

   d Click **OK** to save the new login properties.

   e Click **OK** to save the user definitions.

Define a SAP Library and SAP Server

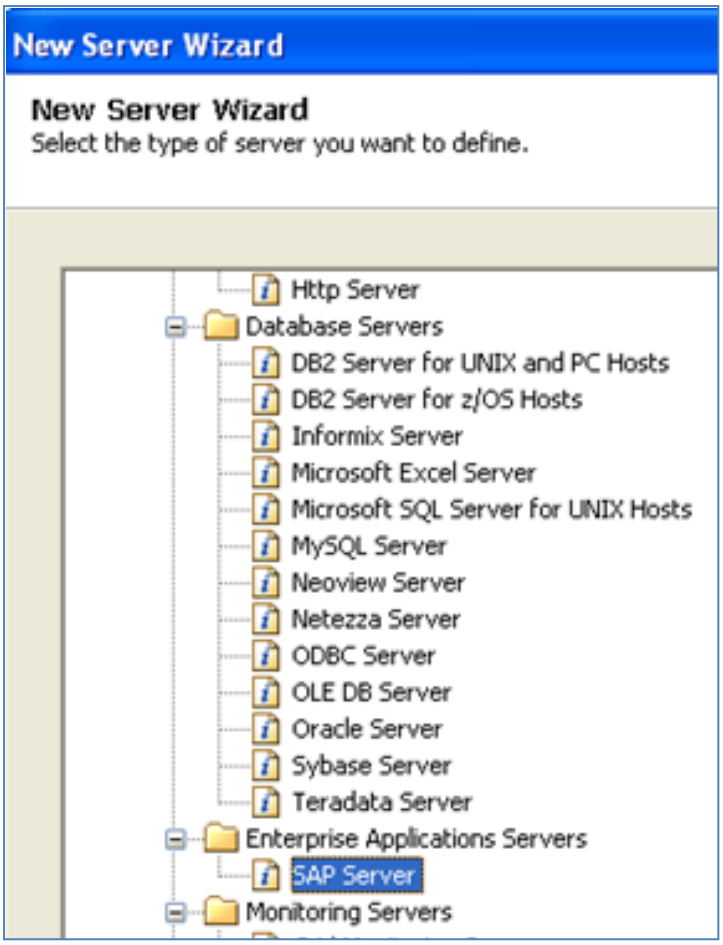
To define a SAP library and SAP server:

1 In the **Repository** field, select **Foundation** repository or select a repository that is solely dependent on the Foundation repository to connect to the metadata server at the foundation level.

2 In the left pane, expand **Server Manager**.

3 Right-click **Server Manager** and then select **New Server**. The New Server Wizard opens (Figure 8).

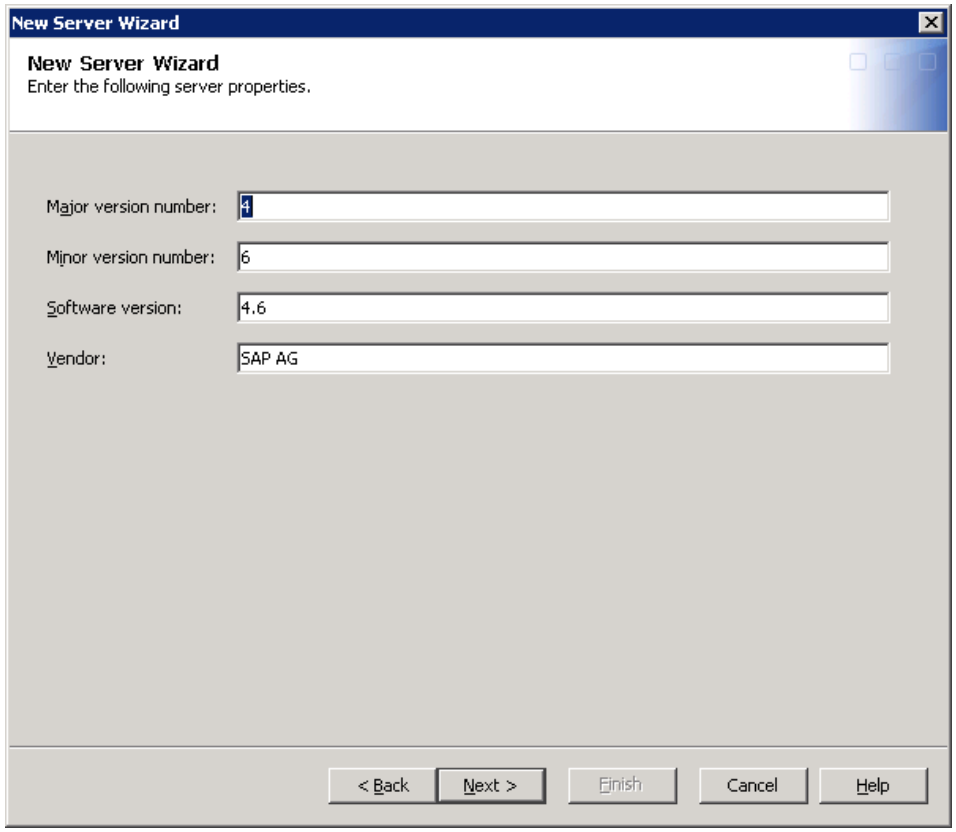
Figure 8. Server Manager Properties



4 Select **SAP Server** from the Enterprise Applications Servers folder and click **Next**.

5 Enter a name and description for the server and click **Next**.

Figure 9. New Server Wizard

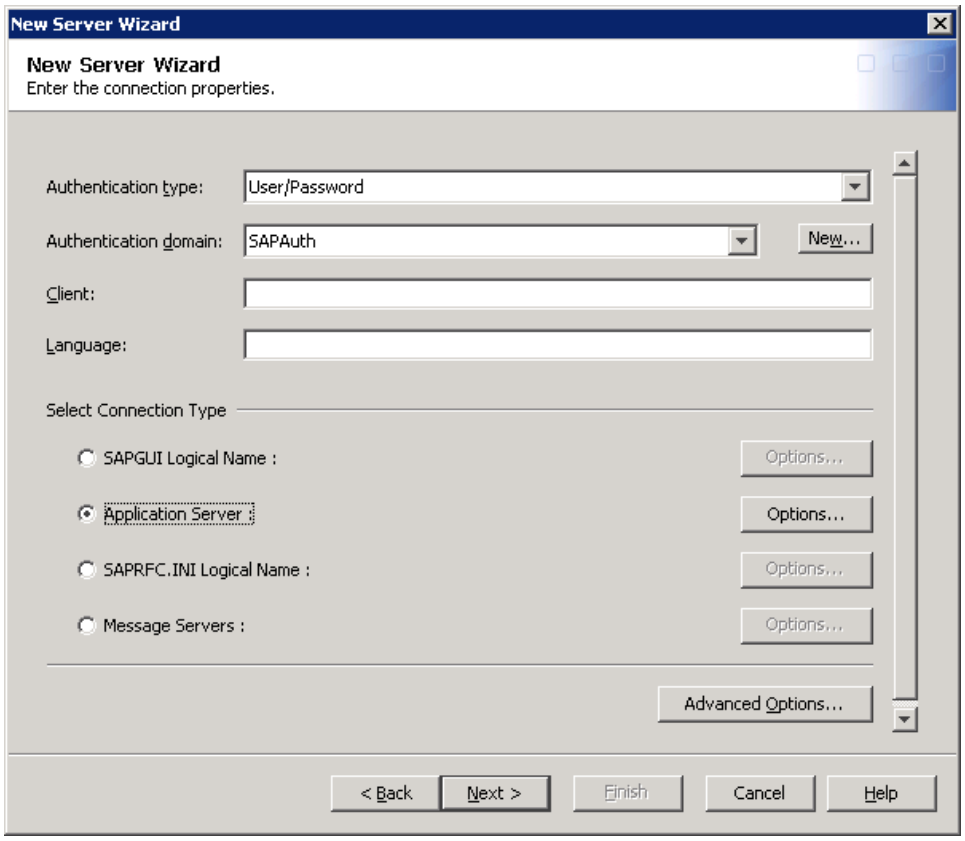


6 (Optional) Enter the version numbers for your SAP software and click **Next** (Figure 9.)

7 Select **SAPAuth** from the **Authentication domain** list (Figure 10)

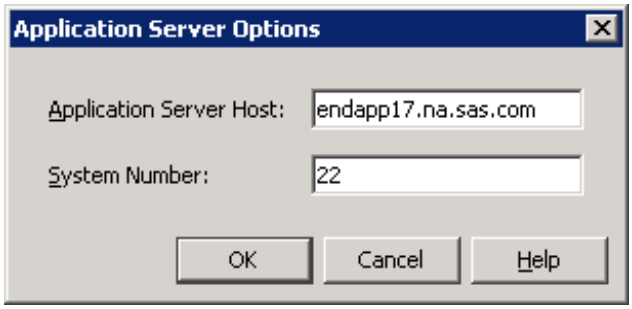
8 Specify the SAP client and SAP language (Figure 10)

Figure 10. New Server Wizard



9 Select the **Application Server** connection type and click **Options**. The Application Server Options dialog box opens (Figure 11).

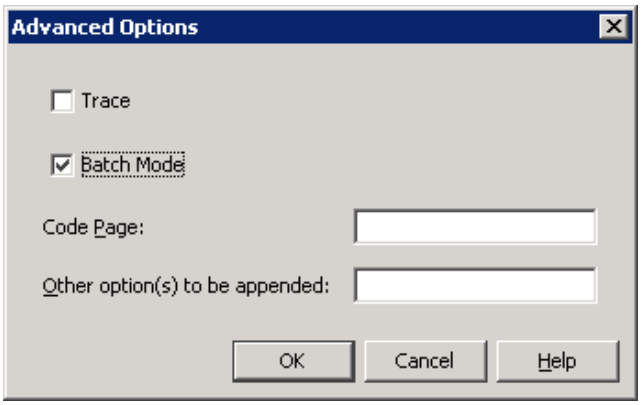
Figure 11. SAP Application Server properties



10 Specify the values for the application server host and system number and click **OK**.

11 Click **Advanced Options**. If this button is not visible, scroll down the New Server Wizard page. If you have defined batch servers or processes, you might need to specify some of the advanced options that are available (Figure 12).

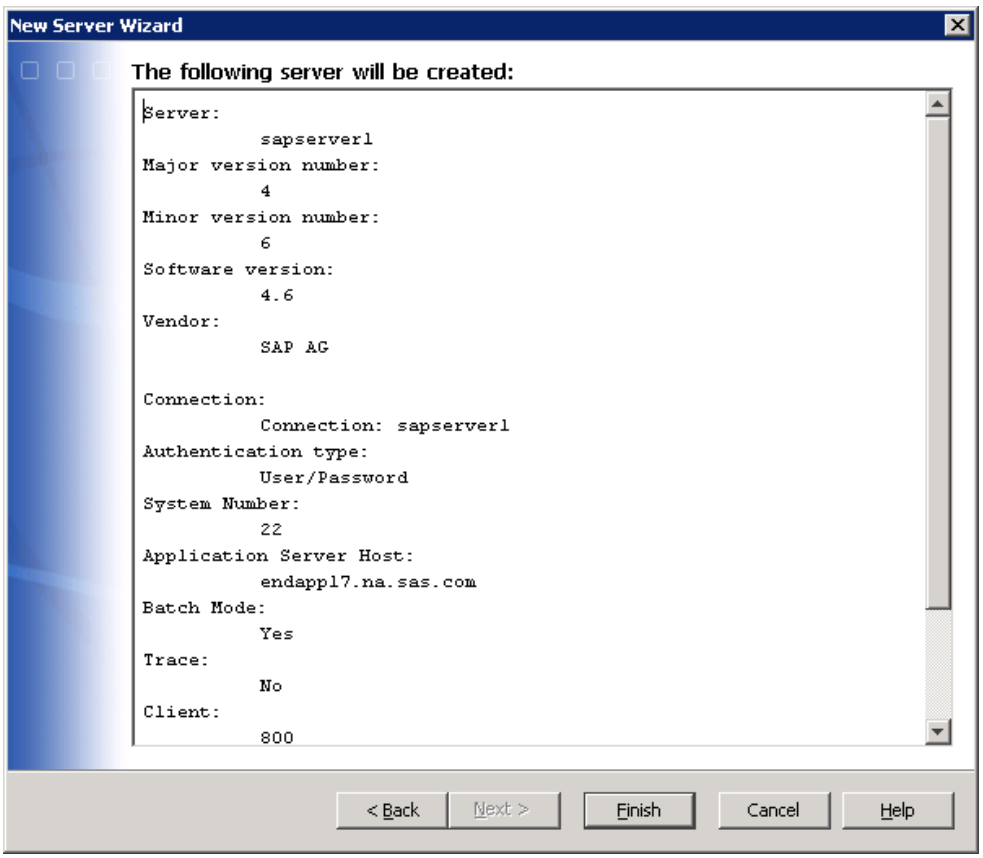
Figure 12. SAP Application Server properties



12 In the Advanced Options dialog box, specify values for the options and click **OK**.

13 Click **Next (Figure 13).**

Figure 13. SAP Server Wizard Summary



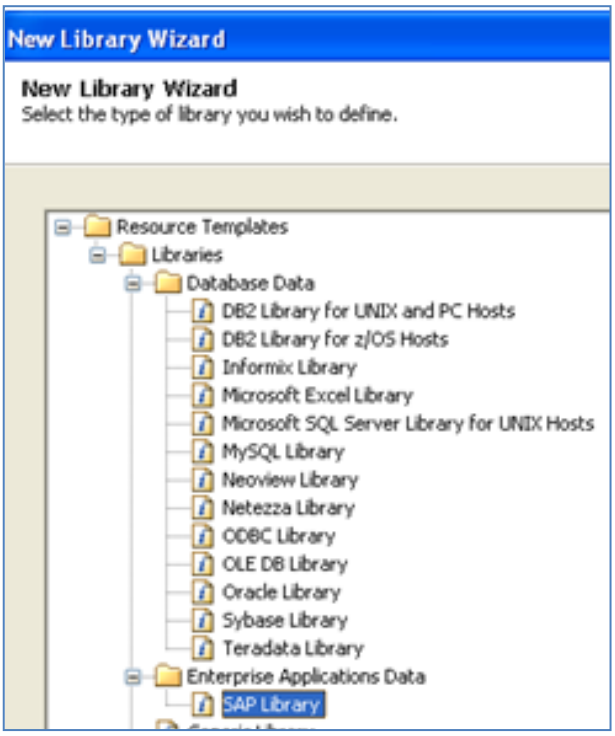
14 Review the summary information and click **Finish** to save the new SAP server and return to the main screen of SAS Management Console.

15 Change the connection profile to the Non-Admin SAS User or any External User. Do not use sasadm connection profile.

16 In the left pane of the SAS Management Console, expand **Data Library Manager**.

17 Right-click **Libraries** and select **New Library**. The New Library Wizard opens (Figure 14).

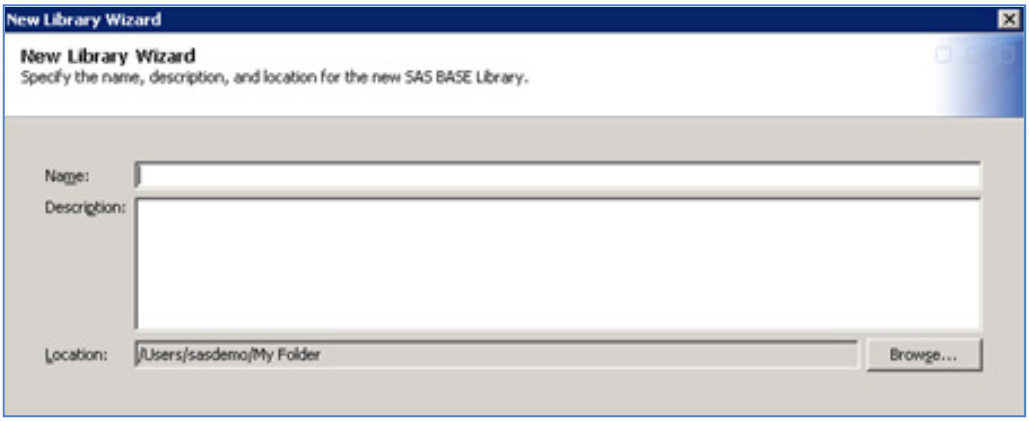
Figure 14. New Library Wizard



18 Select **SAP Library** from the **Enterprise Applications Libraries** folder and click **Next**.

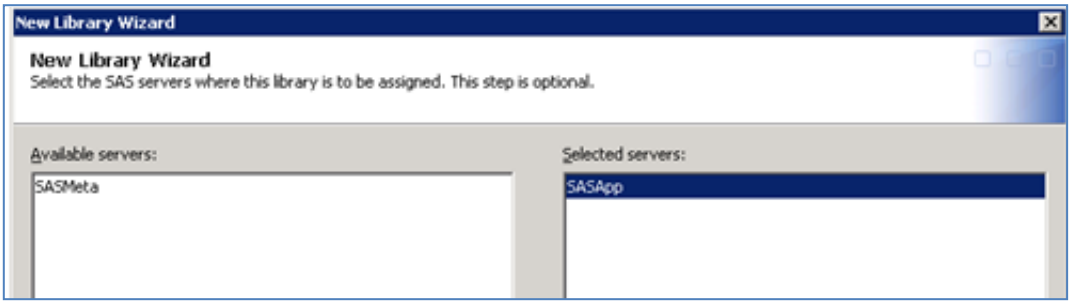
19 Enter a name and description for the SAP library and click **Next** (Figure 15).

Figure 15. New Library Wizard



20 Select the required SAS server and click **Next**. (Figure 16.)

Figure 16 SAS Server for the New Library



21 In the **Libref** field, type **SAPEng**. SAPEng is the default value that the imported metadata uses and you can provide any name complying to SAS LIBNAME standards. Click **Next** (Figure 17).

Figure 17. SAP Library Name

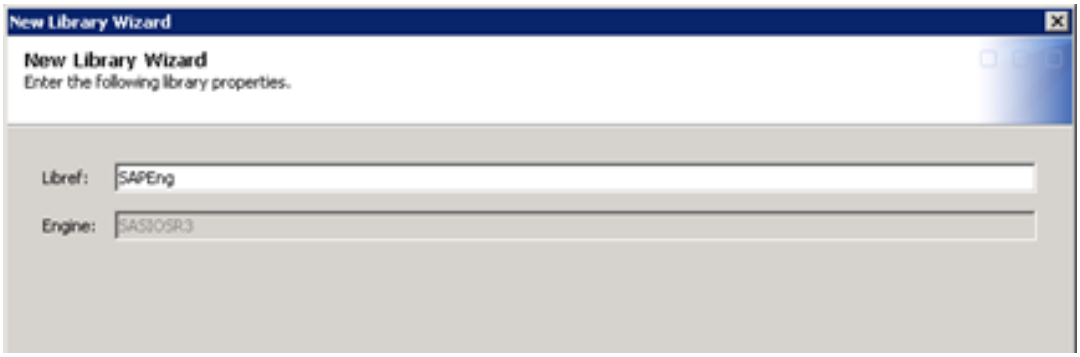
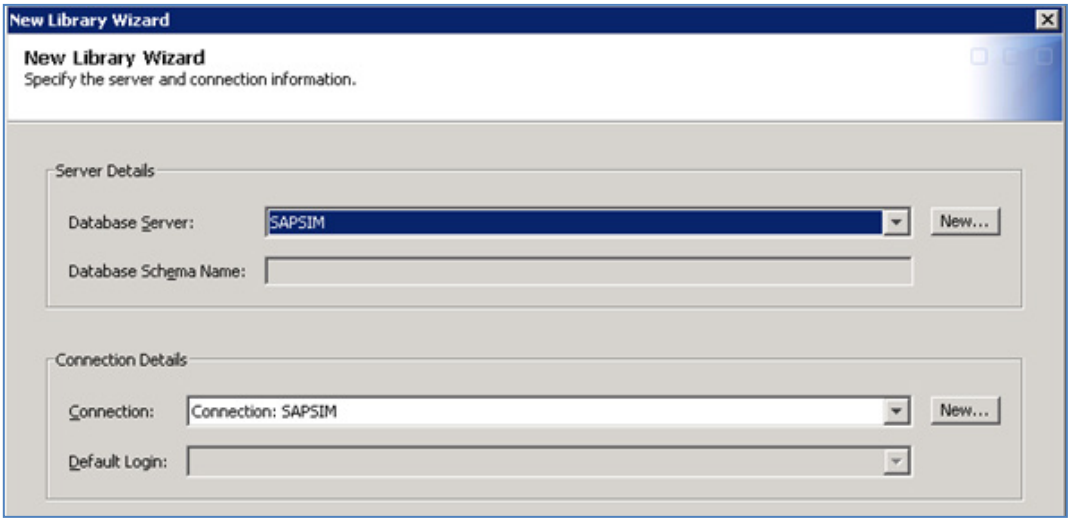


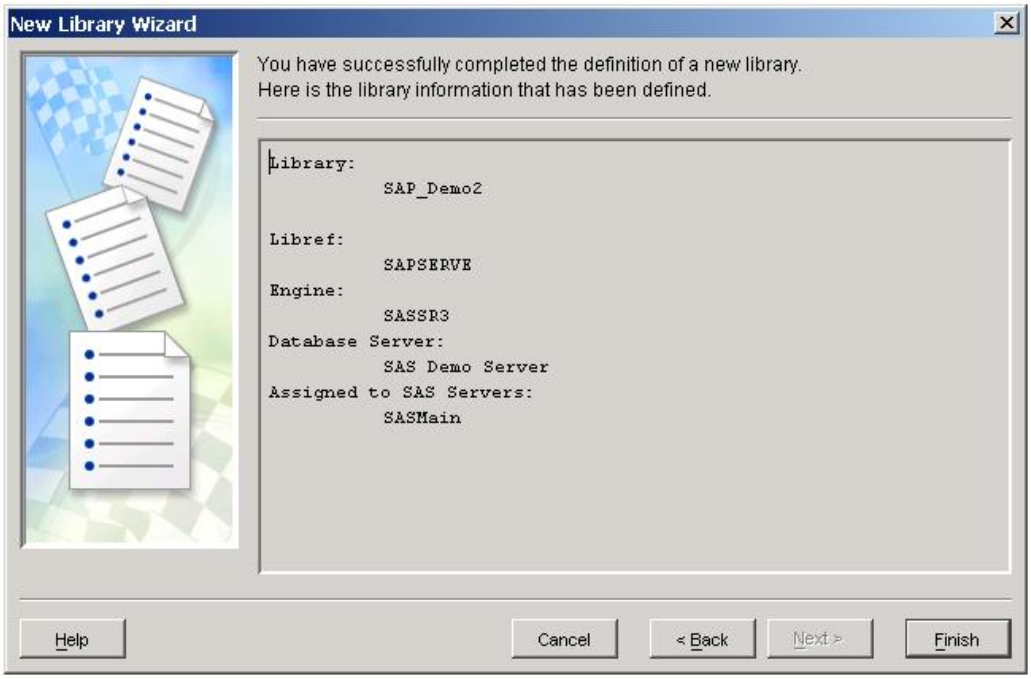
Figure 18. SAP Server properties for the SAP Library



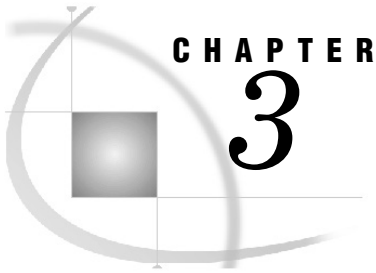
22 In the **Database Server** field, select a database server that contains parameters that connect to the SAP server. If an appropriate database server is not already

available in the menu, complete the steps 1 to 15 to create one. Click **Next (Figure 19).**

Figure 19. SAP Library Wizard Summary



23 Review the summary of the new library definition and click **Finish**.



CHAPTER 3

Configuring SAS Forecasting for SAP APO

Overview

Before you can use the SAS Forecasting for SAP APO, you would need to install transport files, provided by SAS installer, to SAP system. In addition, you would also need to configure SAS system to register stored process for SAS Forecasting for SAP APO in Metadata server and publish them as web services.

Installing SAP Components on SAP SCM System

The following steps are required on the SAP System:

1. Import the SAP transports into your SAP system.
2. Activate BAdI implementation for SAS Forecasting Menu.

Prerequisites for SAP Component Installation

A valid SAP user ID and password is required. The user must have permission to transport files and for RFC destination maintenance. It is *strongly recommended* to get assistance from your SAP System Administrator to perform these tasks.

Importing SAP Transport files

SAP Transport files are included in SAS Forecasting for SAP APO Installation Package. After completing the installation steps mentioned in the Overview section of this chapter, the SAP transport files are available in the folder

"<SASHOME>/SASFoundation/9.3/forcstsapmva/sasmisc/Install/saptrans.zip"

On Windows, <SASHOME> typically is

"C:\Program Files\SASHome"

These transport files include all of the components such as ABAP programs and function modules, menu enhancements needed to run SAS Forecasting for SAP APO.

The SAP transports have to be imported on each SAP application server that is going to be accessed by SAS. If an SAP system is upgraded, the delivery transports have to be imported again.

Two sets of transports are included, one for releases prior to SAP SCM 5.0 and one for SAP SCM 5.0 and above. You must import the transport files that apply to your system (Figure 20).

Figure 20. SAS Forecasting for SAP APO Transport Files

Transport	Purpose	Install if:
SAPKF92020INSAS	SAS Forecasting Add-in for SAP APO v4.1 - SCM 5.0 or higher	SAP SCM 5.0 and above
SAPKF92011INSAS	SAS Forecasting Add-in for SAP APO v4.1 - GUI Definition	GUI Status to be modified(Optional)
SAPKF92030INSAS	SAS Forecasting Add-in for SAP APO v4.1 - SCM version is lower than SCM 5.0	SAP SCM version is lower than SCM 5.0

To upload the transport files to your SAP SCM system, follow the instructions below. The instructions are based on the usage of the tp program (a utility for transport between SAP systems) on the operating system level.

1 Log in as SAP System Administrator to the SAP application server.

2 Move the transport files into the appropriate directories on your SAP SCM system.

For SAP application servers on Windows

Copy the SAPAPOTransports.zip file supplied in the installation package to your SAP application server and extract the self-extracting .zip file into the transport directory (for example, <drive>:\usr\sap\trans). The files for all transports will be put into the cofiles and data subdirectory.

For SAP application servers on UNIX

Copy the SAPAPOTransports.tar file supplied in the installation package to your SAP application server and extracts the files into the transport directory (for example, /usr/sap/trans).

Assuming the tar file is downloaded to the user's HOME directory; follow these procedures to extract the files into the cofiles and data subdirectory in /usr/sap/trans.

cd /usr/sap/trans tar –xvf $HOME/SAPAPOTransports.tar

3 Go to the transport program directory.

For Windows:

<drive>: cd \usr\sap\trans\bin

For UNIX:

cd /usr/sap/trans/bin

4 Load the transport into the transport buffer with the following command. Replace <*target sid*> with the system ID for your SAP system.

tp addtobuffer SAPKF92020INSAS *<target sid>*

Note: Make sure you are using the correct profile for the transport control program tp. In some cases it might be necessary to use the parameter pf= to specify the TPPARAM file.

Note: Because the transport file uses a long name, the nbufform=true TP option must be set. The option can either be maintained in the SAP system using transaction STMS, or it can be specified as a parameter to the tp command. Additionally the TP option tp_version= must be set to at least 264 to allow the long names.

Considering these two notes, the tp commands might require additional parameters. Replace <*sid*> with the system ID for the SAP system.

Important: The tp commands listed on several lines in the following examples should be entered on a **single** command line. Be sure to include a space before adding the text from each of the following lines.

For Windows:

```
tp addtobuffer SAPKF92020INSAS <sid>
pf=\usr\sap\trans\bin\TP_DOMAIN_<sid>.PFL –D”nbufform=true” –D”tp_version=264”
–D”setunicodeflag=true”
```

For UNIX:

```
tp addtobuffer SAPKF92020INSAS <sid>
pf=/usr/sap/trans/bin/TP_DOMAIN_<sid>.PFL –D”nbufform=true” –D”tp_version=264”
–D”setunicodeflag=true”
```

5 Import the transport.

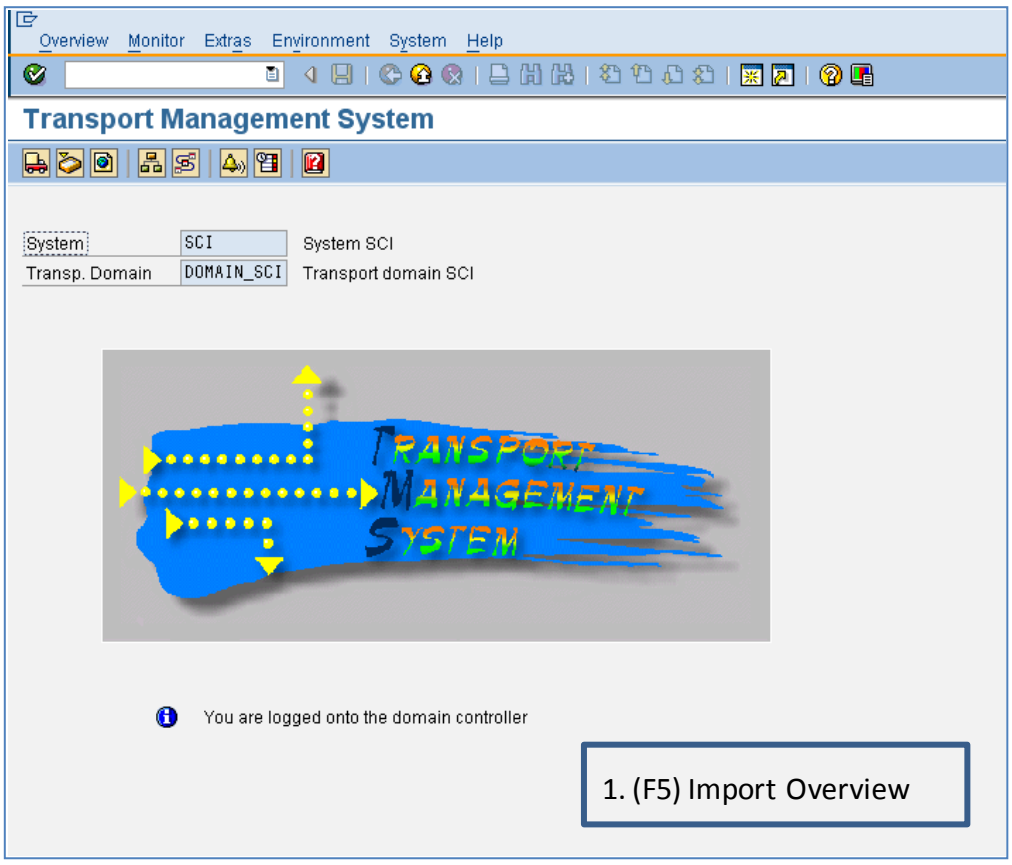
There are two methods to import the transport into the SAP SCM system which are show below:

- Using the STMS Transaction in SAP
- Using the tp command on the SAP Application Server

A. Using the STMS transaction in SAP

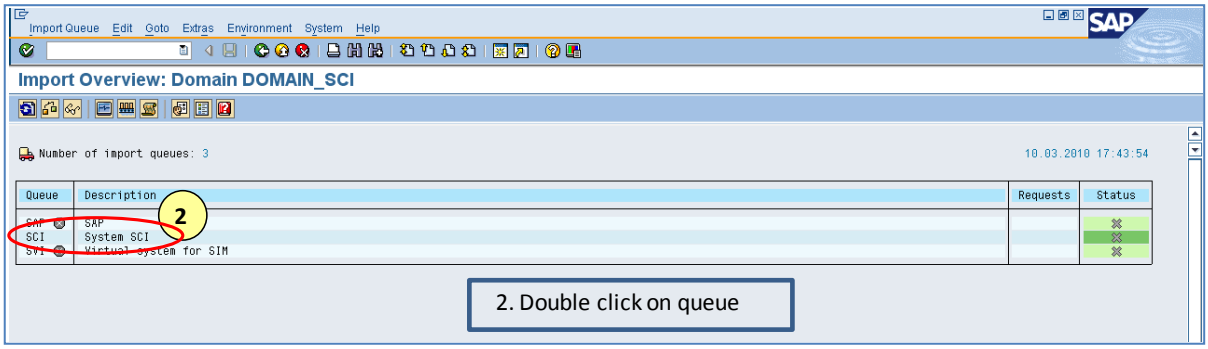
- Start Transaction STMS. Press F5 for Import Overview. (Figure 21.)

Figure 21. STMS transaction in SAP



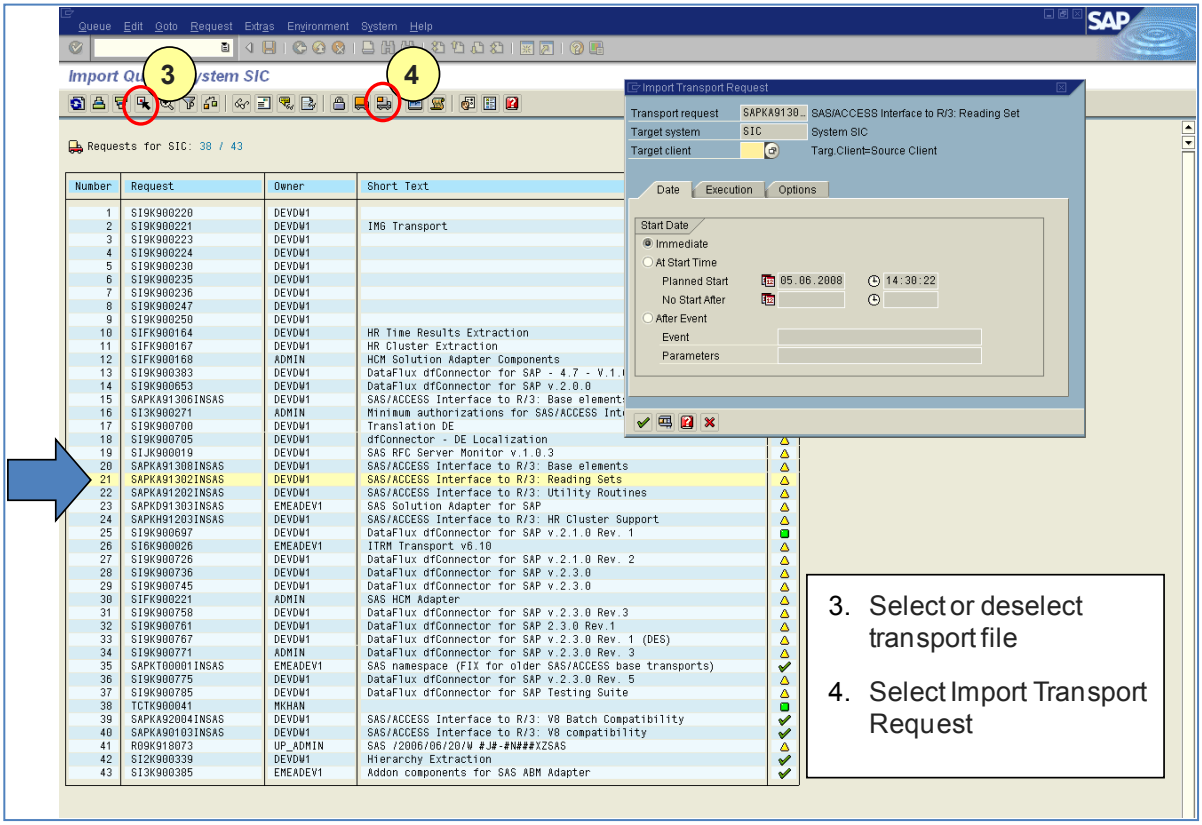
- Go to (double click) the Import Queue in the transaction STMS (Figure 22).

Figure 22. Import Overview – Select Queue



- Select the transports to be imported into the SAP SCM System.
- Import the transports into the SAP SCM System (Figures 23).

Figure 23. Import Overview – Select Queue



B. Using the tp command on the SAP Application server

Test your connection to the target system and then import the transport with the following commands. Replace *<target sid>* with the system ID for your SAP system.

tp connect *<target sid>* tp import SAPKA92001INSAS *<target sid>* U2

Note: The U2 option allows the originals to be overwritten if the user has previously installed these ABAP objects.

Note: Make sure you are using the correct profile for the transport control program tp. In some cases it might be necessary to use the parameter pf= to specify the TPPARAM file.

Note: Because the transport file uses a long name the nbufform=true TP option must be set. The option can either be maintained in the SAP system using transaction STMS or it can be specified as a parameter to the tp command. Additionally the TP option tp_version= must be set to at least 264 to allow the long names.

Note: The transports contain only client-independent ABAP objects. The tp import can therefore use any existing client that is correctly set up for imports. Verify that the ABAP program RDDIMPDP is correctly scheduled in the client you use for the import.

Considering these notes, the tp commands might require additional parameters. Replace <*sid*> with the system ID for the SAP system.

For Windows:

```
tp import SAPKA92001INSAS <sid> pf=\usr\sap\trans\bin\TP_DOMAIN_<sid>.PFL –
D"nbufform=true" –D"tp_version=264"
```

For UNIX:

```
tp import SAPKA92001INSAS <sid> pf=/usr/sap/trans/bin/TP_DOMAIN_<sid>.PFL –
D"nbufform=true" –D"tp_version=264"
```

For Windows and Unicode SAP Server:

```
tp import SAPKA92001INSAS <sid> pf=\usr\sap\trans\bin\TP_DOMAIN_<sid>.PFL –
D"nbufform=true" –D"tp_version=264" –D"setunicodeflag=true"
```

Check the exit code. If you receive an error of 8 or higher, the import failed. You must resolve the problem and re-import the transport. Check the transport logs for more information.

6 Repeat steps 4 and 5 for each of the transports applicable to your SAP installation.

Configuring SAS Components on SAS Server

Installing the SAS Web Service on the SAS Server

To install the SAS Web Service on your SAS system, follow the instructions below. The instructions are based on the usage of the SAS standard method of creating Web Service.

1 Create a work folder for SAS Forecasting for SAP APO, where all users in SAPGroup (described later in the section) have read and write access.

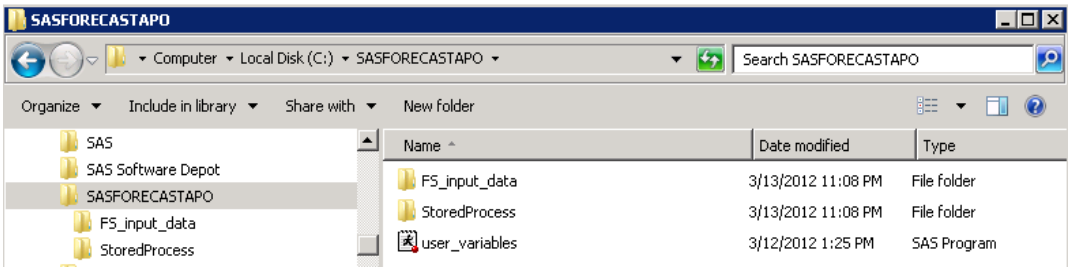
For the purpose of this documentation, we will use C:\SASFORECASTAPO as the work folder for SAS Forecasting for SAP APO.

2 Create a folder "FS_input_data" under C:\SASFORECASTAPO. This folder will be used to store data read from SAP system.

3 Create a folder "StoredProcess" under C:\SASFORECASTAPO. This folder will be used to store the definitions (SAS code) of stored processes required for SAS Forecasting for SAP APO to work.

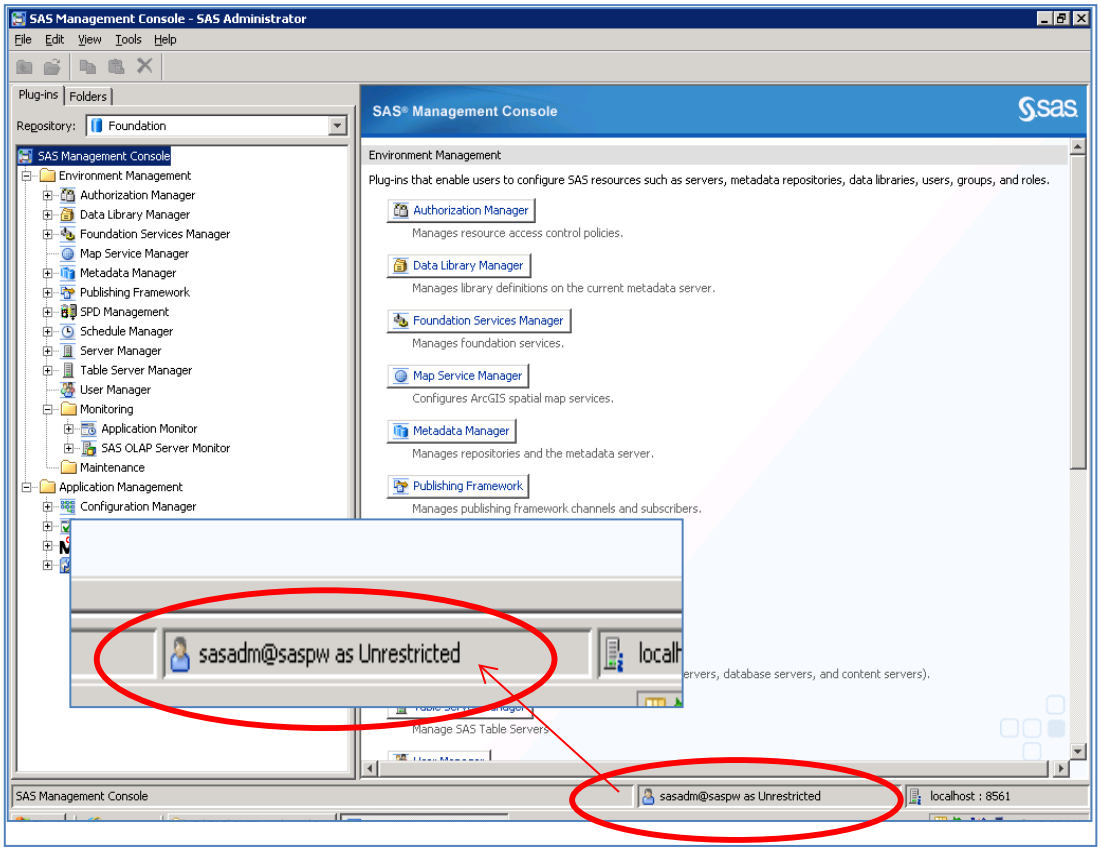
4 Copy “user_variables.sas” from <SASHOME>/SASFoundation/9.3/forcstsapmva/sasmisc/Install to C:\SASFORECASTAPO.

At this point your directory structure should look like this



5 Open SAS Management Console with the Administrator Connection profile (as shown in Figure 24). In the metadata connection profile, select the appropriate project.

Figure 24. SAS Management Console

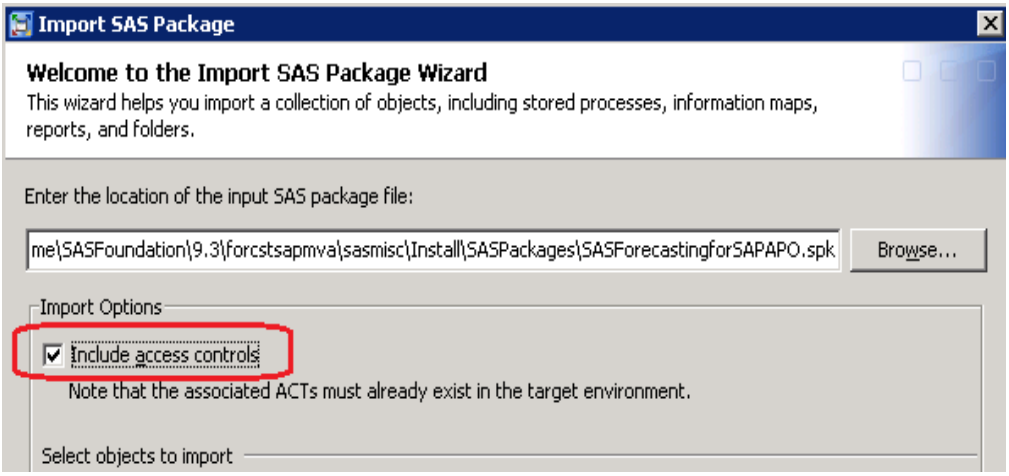


6 Import the SASForecastingforSAPAPO.spk Package into the SMC under products folder using Metadata import wizard (Figure 25).

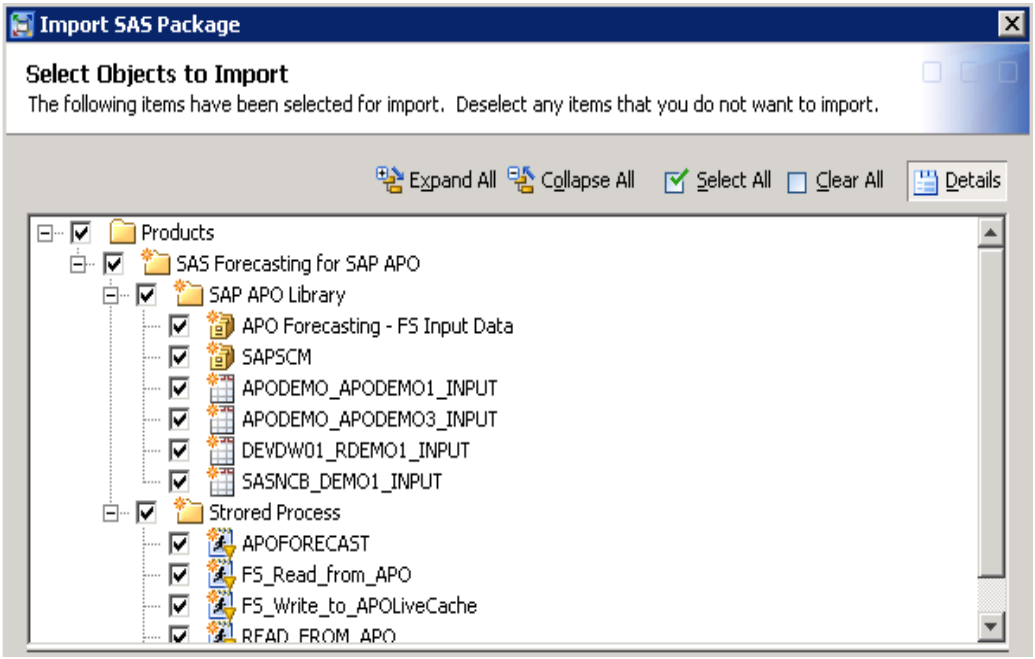
Figure 25. Import SAS Package

The SAS package can be found under <SASHOME>/SASFoundation/9.3/forcstsapmva/sasmisc/Install/SASPackages

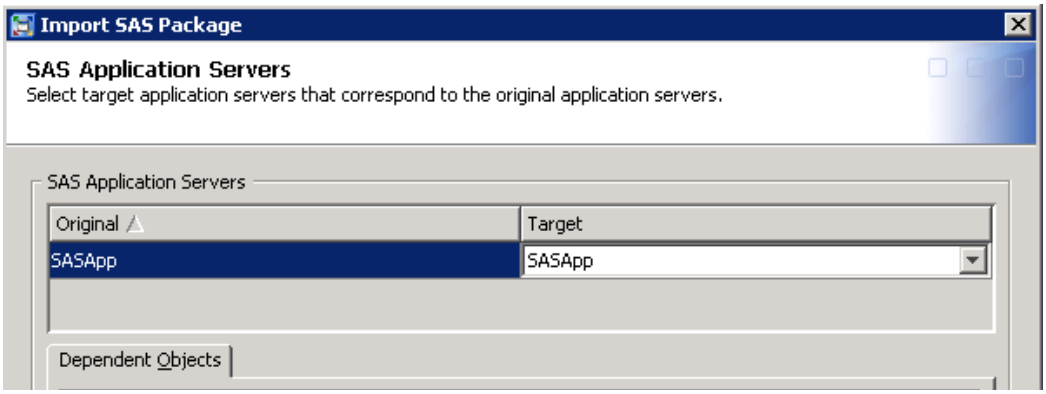
In the Import wizard, once the package is selected from the above location, select the option “Include access controls” Press Next.



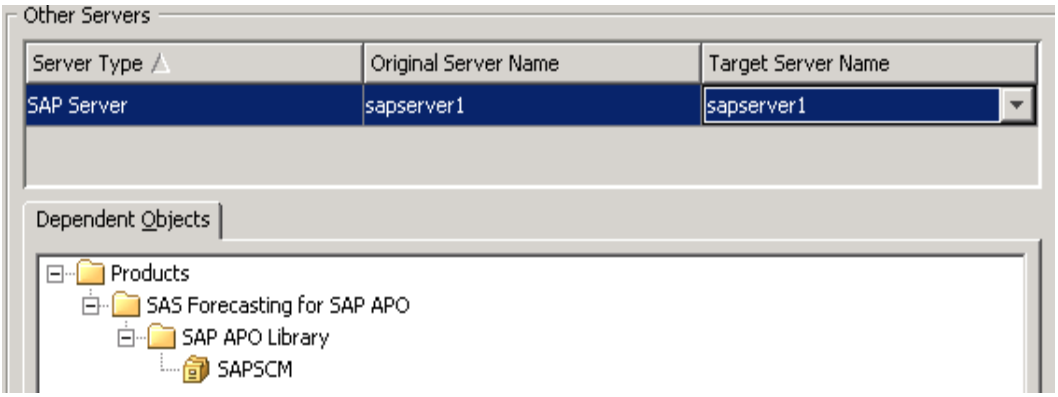
The Import wizard will show the objects to be imported. Press Next.



Select the target SAS Application server as "SASApp" in the Import wizard and press Next.

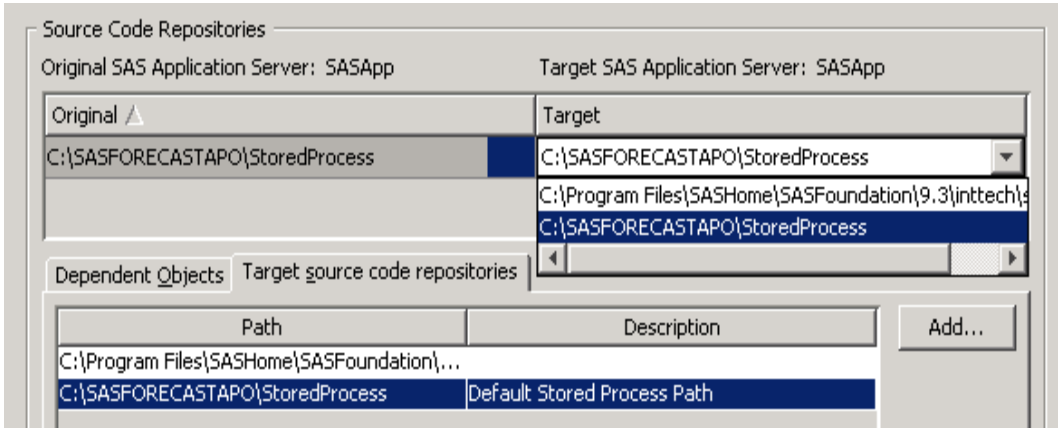


Select the target SAP SCM (APO) server which has been configured as explained the step "Configuration of Data Surveyor on SAS Server" under Chapter 3. After selecting the Target Server press Next.

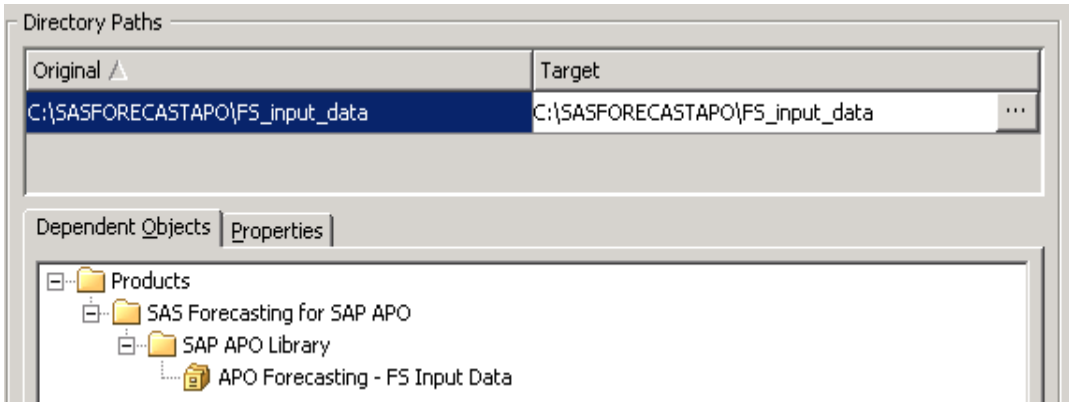


In the next screen, Import Wizard shows the Stored Process location. Press the Add button and create the path that points to the store process folder location in step 3 above (i.e. C:\SASFORECASTAPO\StoredProcess)

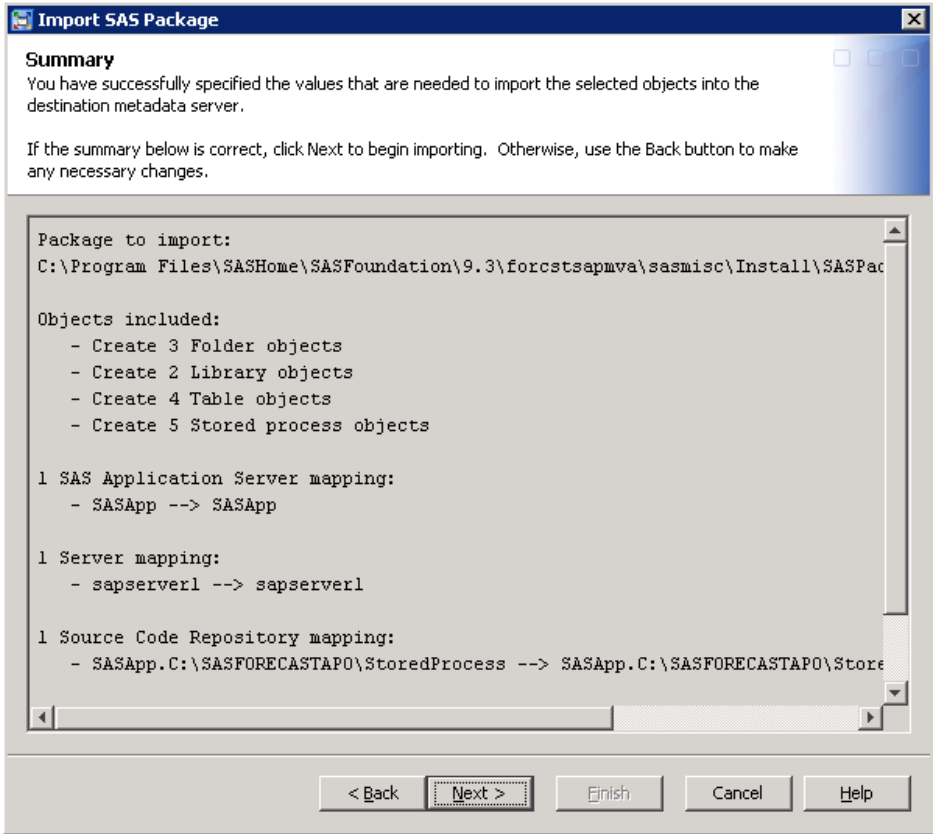
Press Next button once the Target path is selected.



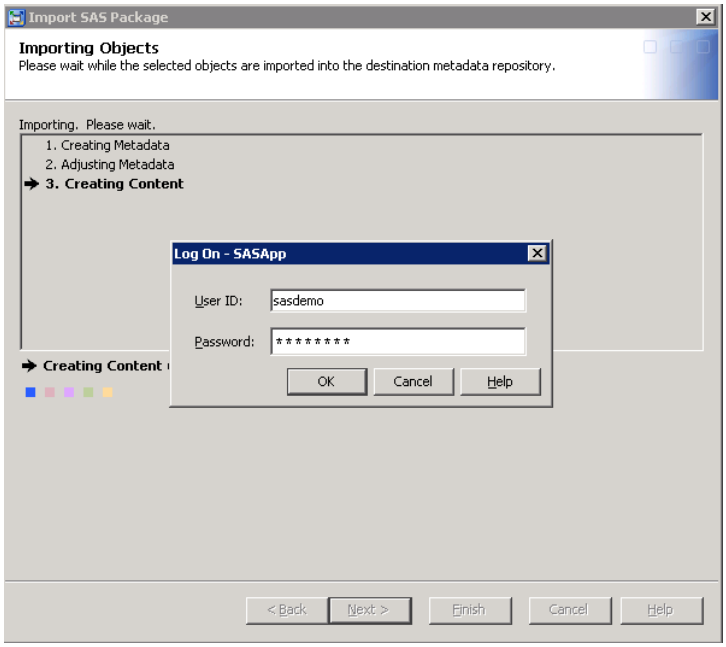
Next screen shows the path of the Directory for the Library “APO Forecasting - FS Input Data”. This directory is created as part of the Installation and no action is required. Press Next.



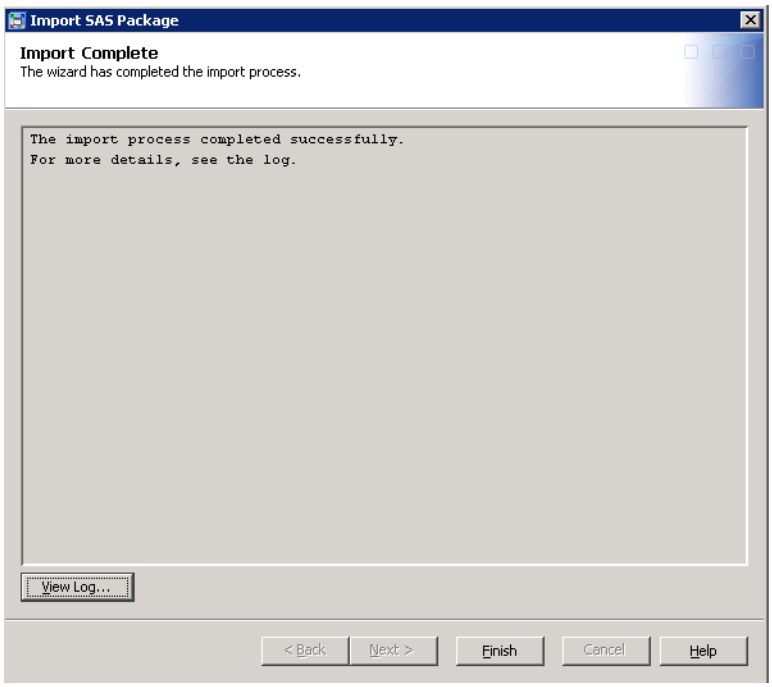
The summary screen is displayed as shown below. Press Next.



Import Wizard need credentials before importing the stored processes, enter the credentials and press OK button.

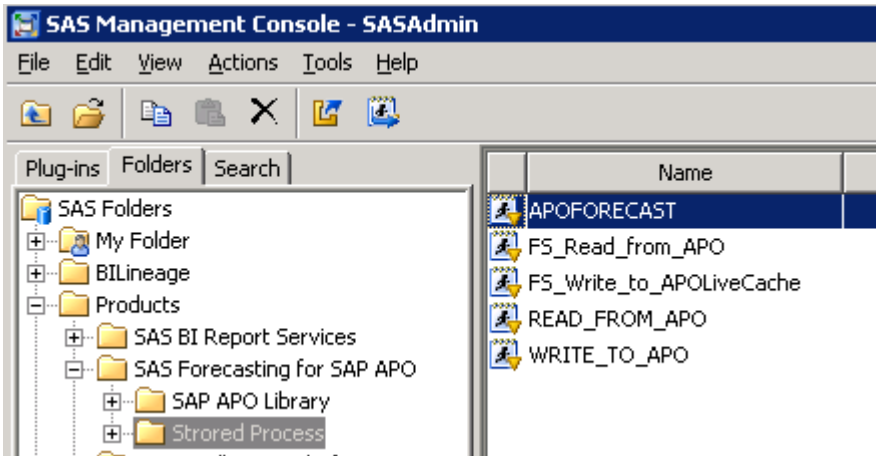


Once the import wizard finishes importing, success message is displayed. If you get any errors, press the button “View Log” to see the error message and take appropriate action to rectify the error.



Once the package is successfully imported, you can see stored process created under Stored Process folder under the Metadata tree (Figure 26).

Figure 26. View Deployed stored processes



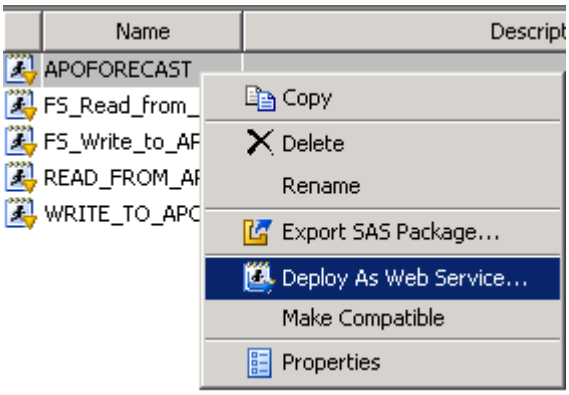
7 After successfully importing the package, you need to deploy following three stored processes as web services

APOFORECAST

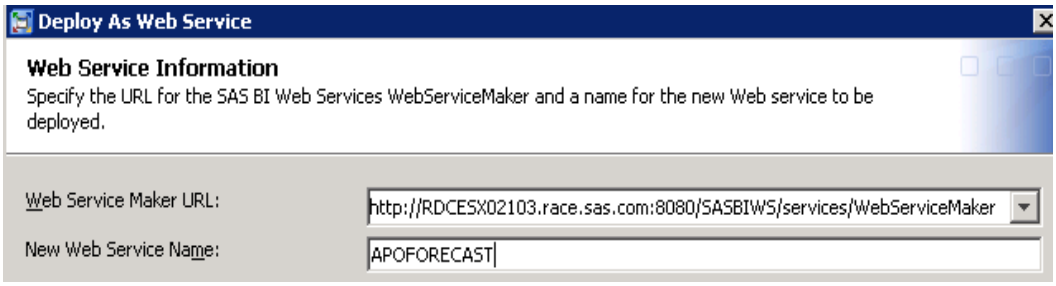
READ_FROM_APO

WRITE_FROM_APO

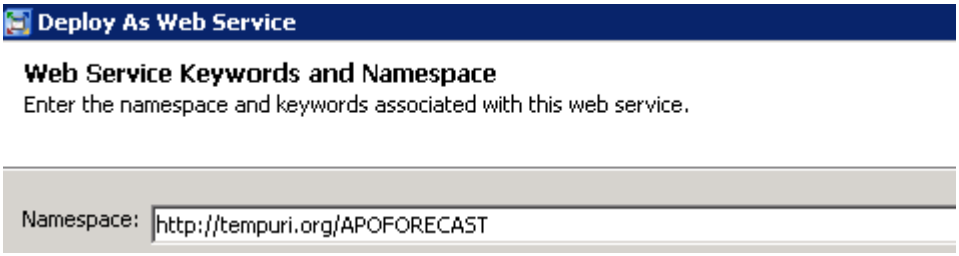
Right click on APOFORECAST stored process and select “Deploy as Web Service”



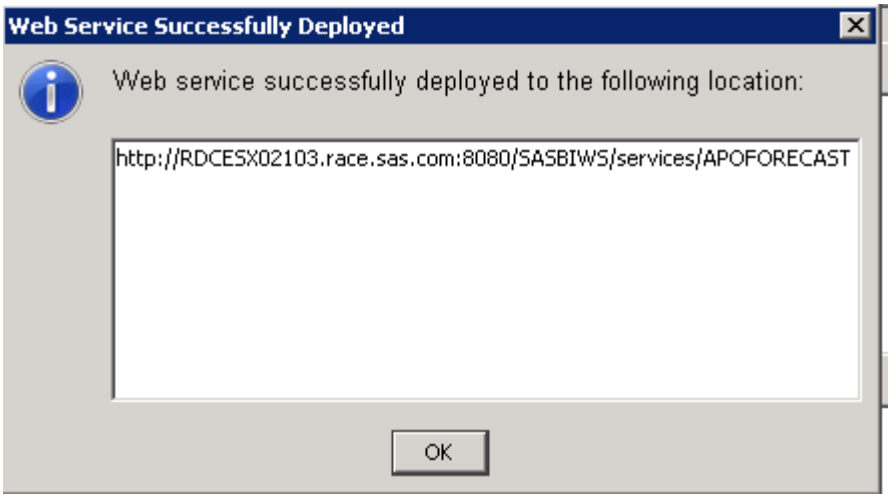
Pick the default web service maker URL and type the web service name as APOFORECAST (in capital letters)



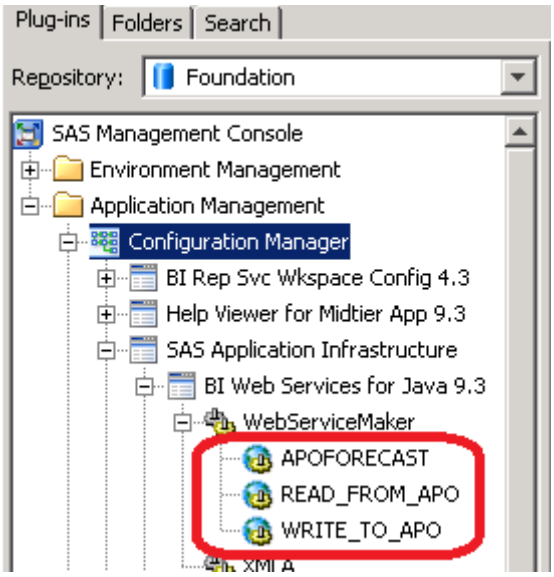
Press Next and select the default namespace

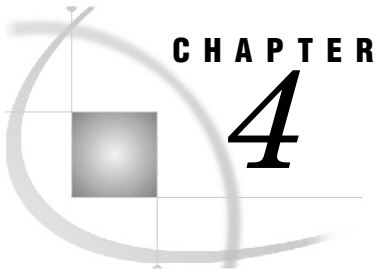


Press Next and then press Finish. A success message should pop up.



Repeat the process for READ_FROM_APO and WRITE_FROM_APO. Validate that all three stored processes are published correctly as described in the diagram below:





CHAPTER 4

Post-Installation Steps

Overview

This chapter explains the post-installation steps to be carried out both on SAP SCM and SAS Servers.

Post-Installation steps on SAP SCM System

1. Activate BAdI implementation for SAP Forecasting Add-in for SAP APO.

   SAP Forecasting for SAP APO has one basic implementation for the SAS Add-in Menu and the Web Service triggering options. The SAS Forecasting Menu will be functional only if the BAdI is activated. If you want to activate the SAS implementation for Forecasting Add-in Menu follow these steps:

   - Go to the transaction SE19 in SAP SCM System
   - Enter /SAS/APO_ADDON_BADI as the implementation.
   - Select the Activate button, or select Implementation ▶ Activate from the menu.

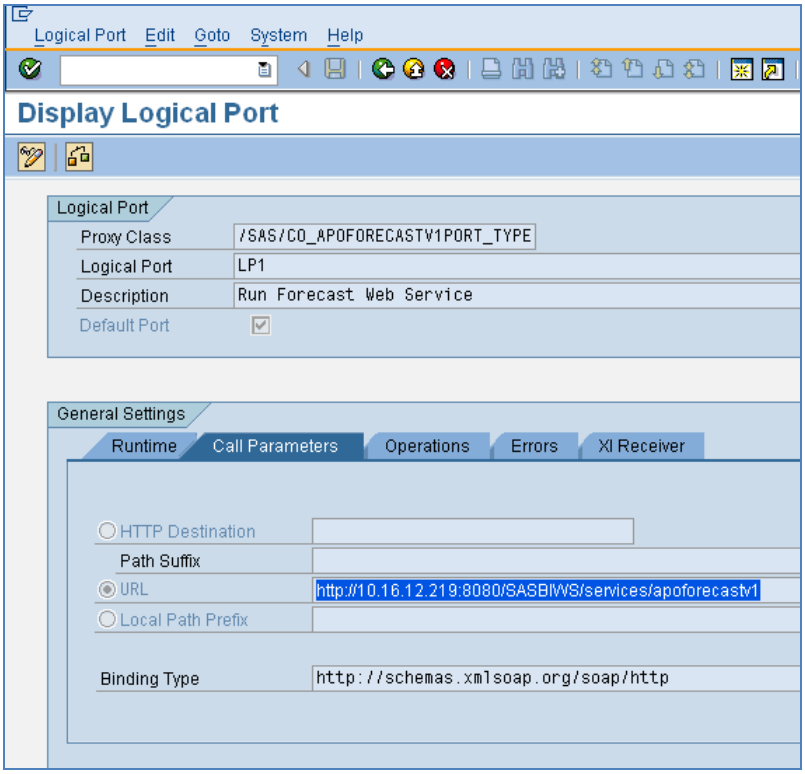
2. Set up the Logical Port for accessing the SAS Web Service.

   a. For SAP SCM systems version lower than 5.0

      - Goto the transaction lpconfig in SAP SCM System.
      - Enter /SAS/CO_APOFORECASTV1PORT_TYPE as the Proxy Class, LP1 as Logical Port and check the Default port.

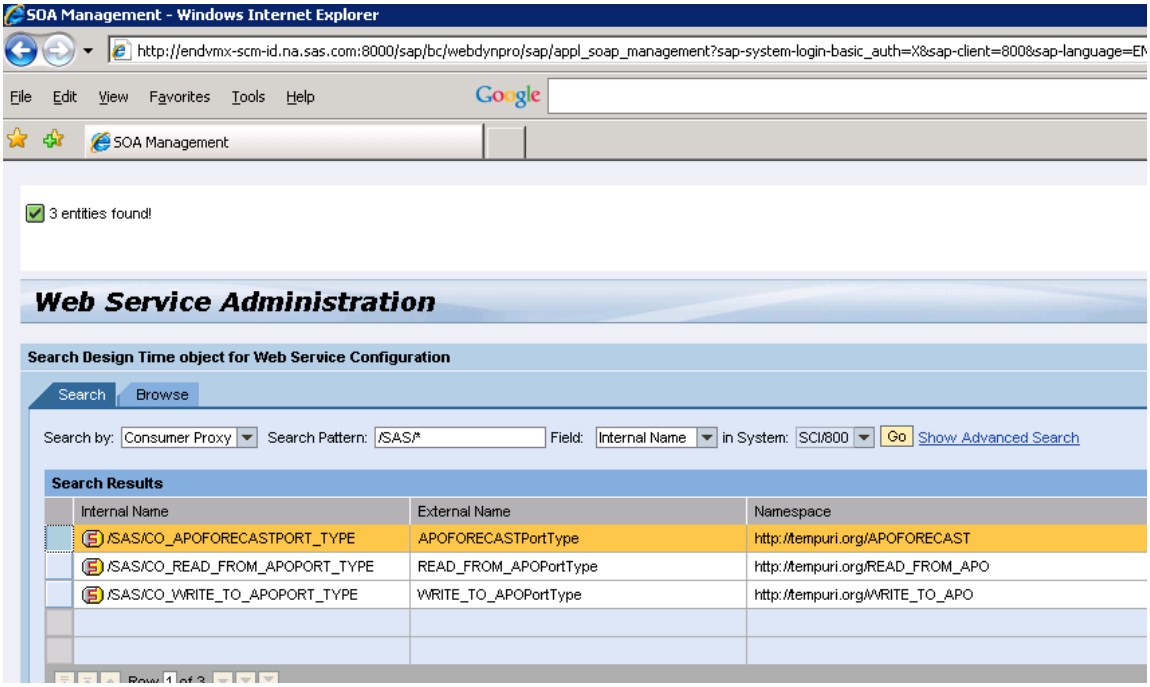
        Change the Web Service URL under “Call Parameters” tab as per your SAS Environment (Figure 27).

Figure 27. Display Logical Port

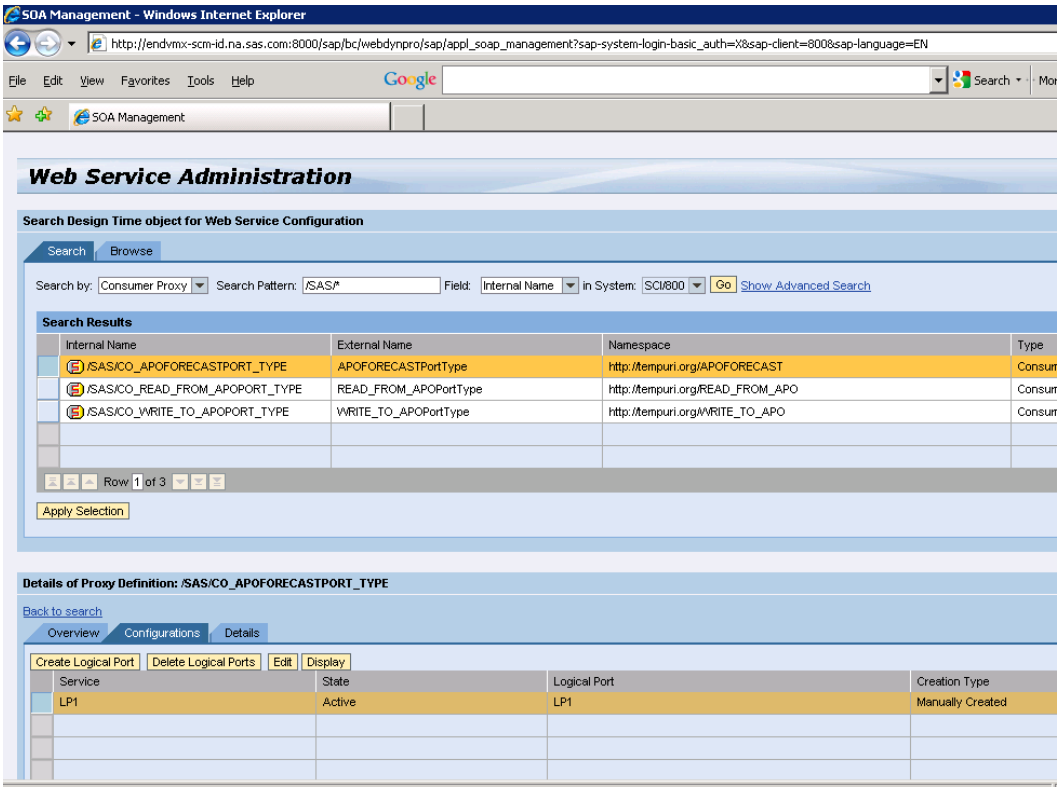


b For SAP SCM systems version 5.0 or higher

i. Start the SOA Manager with TCODE soamanager.
ii. From the main screen of the SOA Manager,
    1. SAP NW 7.1
        a. Go to the Application and Scenario Communication tab.
        b. Select Single Service Administration.
    2. SAP NW 7.0
        a. Go to the Business Administration tab
        b. Select Web Service Administration
iii. Specify or search for the consumer proxy, the internal name is /SAS/CO_APOFORECASTPORT_TYPE
iv. Select the consumer proxy from the overview and choose Apply Selection to display design-time information about the consumer proxy.



v. Go to the Configurations tab.
vi. To create a new logical port, choose Create Logical Port. A dialog box is displayed.
vii. Select Manual Configuration for the configuration type.



viii. Specify a name of the new logical port, for instance SAS_ WEBSERVICE

ix. If you are creating the default logical port, select the Logical Port is Default checkbox.
x. Select the Apply Settings button. The new logical port is displayed for editing in the SOA Manager.
xi. Choose the Messaging tab.
xii. In the DropDown Message ID Protocol select “Suppress ID Transfer”.
xiii. Choose the Transport Settings tab.
xiv. Enter the URL of the DIS server in the URL Access Path field.
xv. Enter the computer name of the DIS server in the Computer Name of Access URL field.
xvi. Enter the port number in the Port Number of Access URL field.
xvii. Save

Post-Installation steps in SAS

Configure the SAS Forecasting Environment

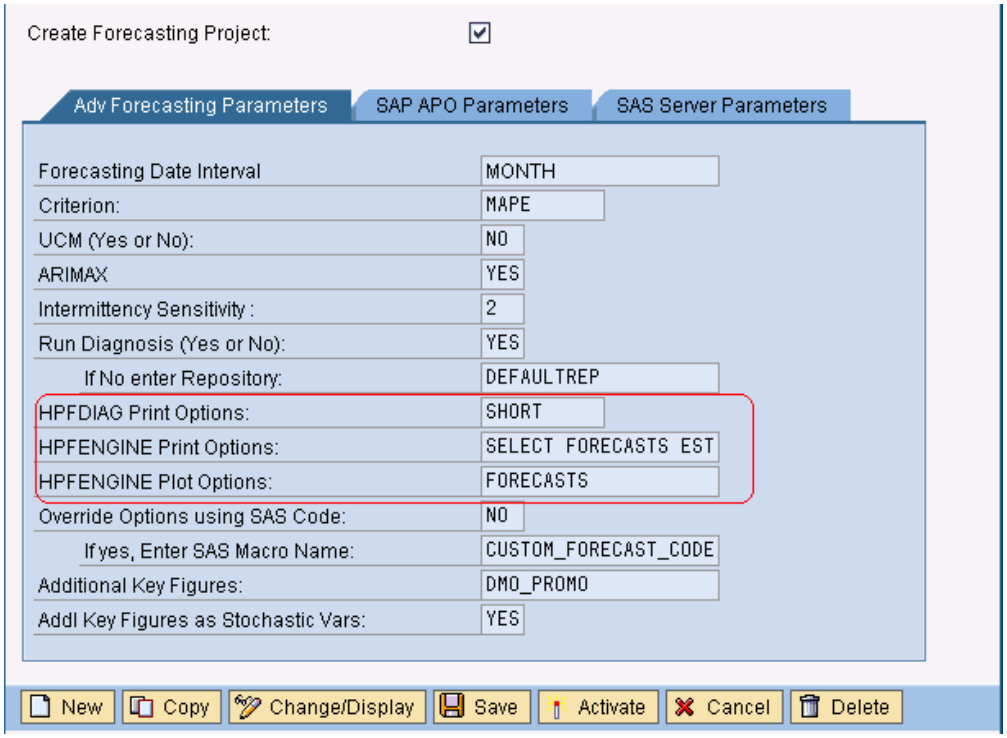
Before you can use SAS Forecasting for SAP APO, you need to modify user_variables.sas file and stored process files to suit your environment.

1. Open C:\SASFORECASTAPO\user_variables.sas file in a text editor and fix values according to your SAP and SAS installation environments.
2. If you have specified a work directory for SAS Forecasting for SAP APO other than C:\SASFORECASTAPO, you need to modify all SAS programs under StoredProcess folder in your work directory. Open each program and fix the location of user_variables.sas according to your environment.

Setting up Remote Access to HTML Library

The Forecasting Profile allows users to request HTML output be created during the Diagnosis and Forecasting steps performed by the SAS Web Service. Figure 28 highlights the Forecasting Profile options that generate HTML output. The HTML created is stored in the SAS Content Server.

Figure 28. Forecasting Profile – Options that generate HTML



Registering Stored Process in SAS Forecast Studio

Prerequisites:

The guide lines given below requires that the installation of Forecast Server is done correct by following the steps described in the “SAS Forecast Server Administrator's Guide”. If the installation is done correctly the default stored processes can be accessed from within Forecast Studio

Since stored processes in SAS consist of SAS programming statements some knowledge of SAS programming is required to create your own stored processes. Furthermore, more advanced use of the possibilities requires knowledge of the SAS macro programming facility.

A SAS program that should be used as a STP has to begin with the following:

***ProcessBody;**
%stpbegin;

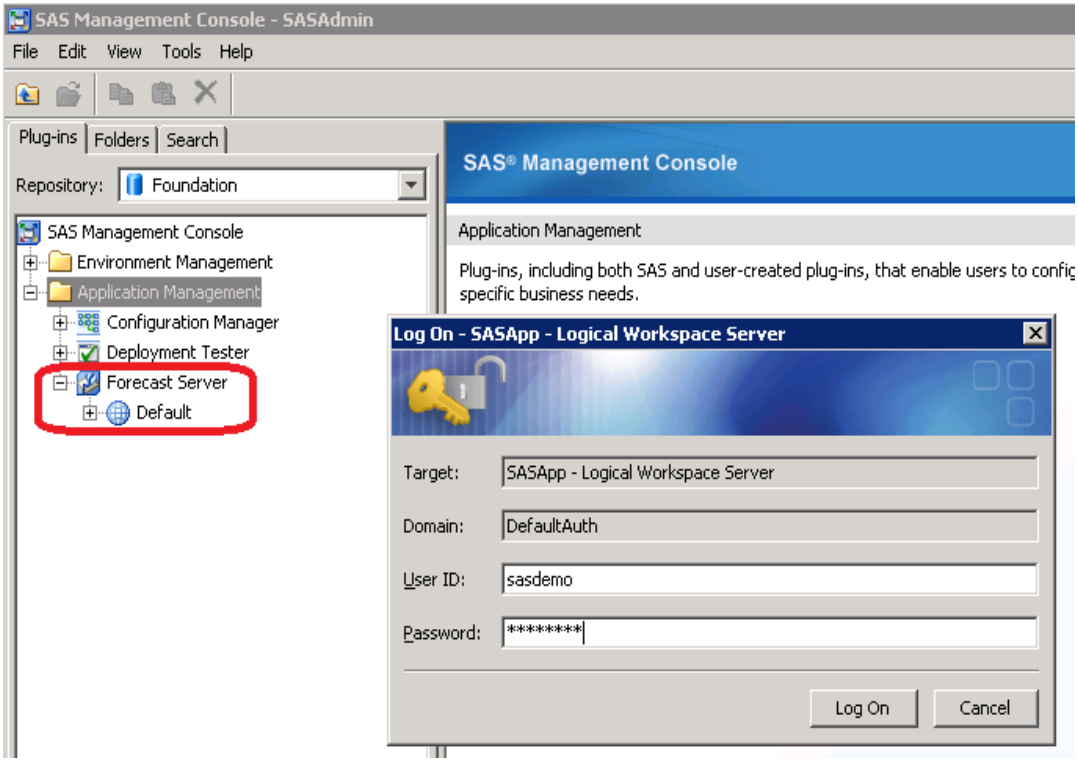
From this point on regular SAS programming statements follow. The stored process has to end with the following:

%stpend;

As part of SAP APO Add-in, two stored processes have been provided which can be used in the SAS Forecast Studio. One Stored Process to create a Forecast Studio Project from SAP APO data and the other Stored Process is to write back the SAS Results to SAP APO LiveCache.

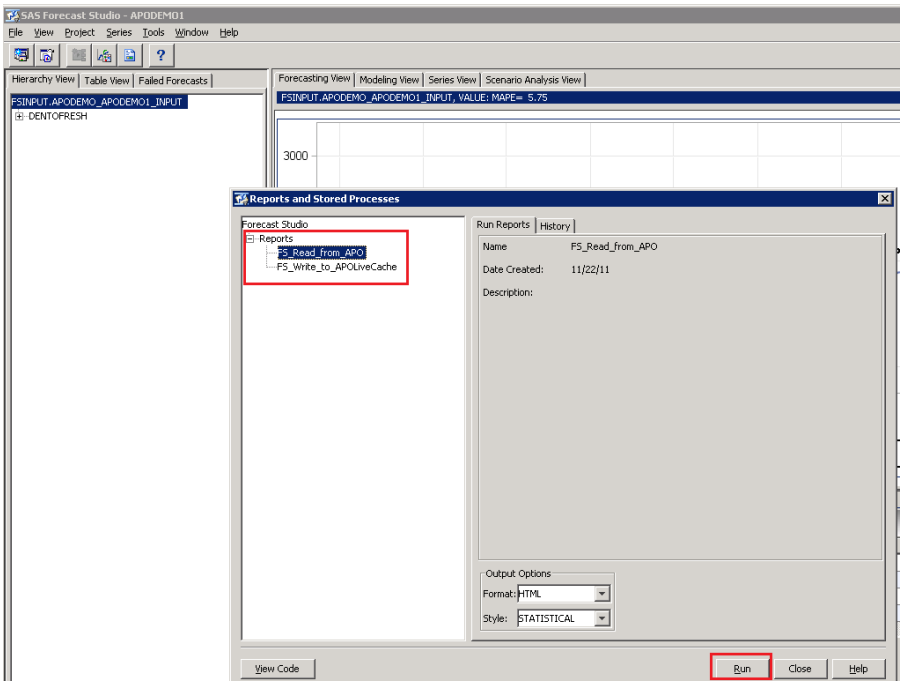
The following steps need to be followed in order to register the Stored Processes in the SAS Management Console.

Open the SAS Management Console and expand the Application Management tree down to the Forecast Server node as shown in the below Figure.

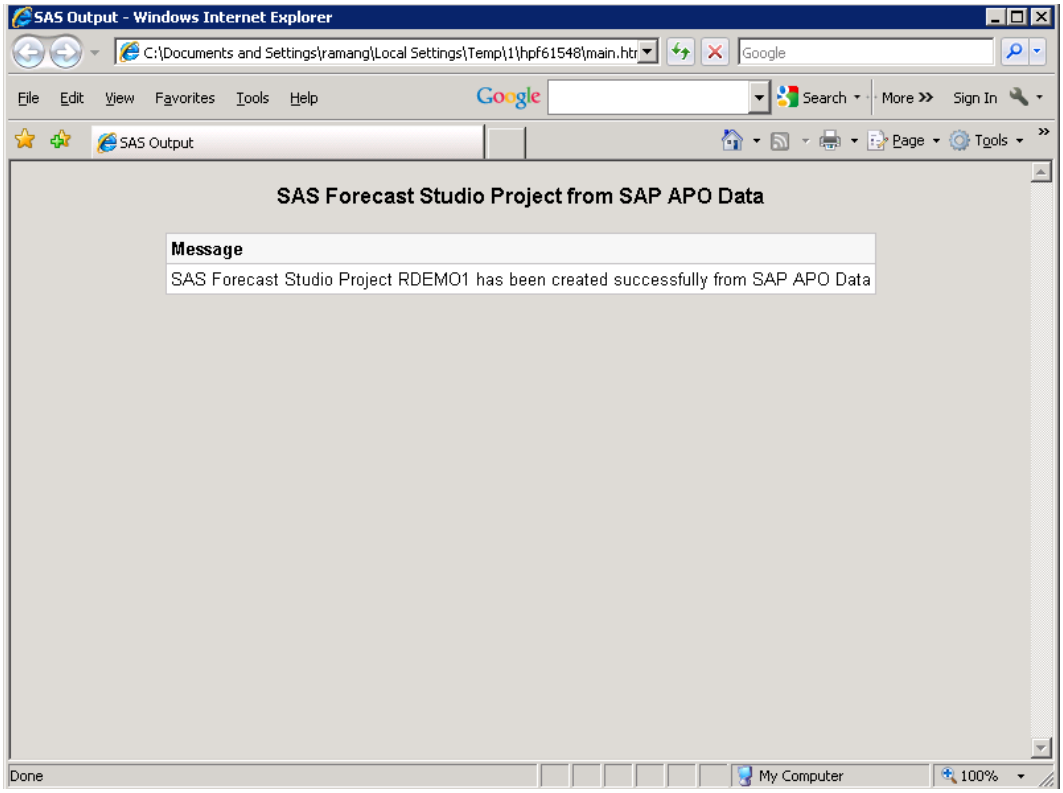


The system prompts the login dialog for the workspace server. Drill down the Forecast Server node to the node “Reports” under the Default Node. Right click the Reports Node and select the option “Search” which will automatically identify the Stored Processes created for the usage in SAS Forecast Studio.

Open Forecast Studio and run your newly created STP. Open the Forecast Studio project you created. Select ‘Tools’ ▶ ‘Reports and Stored Processes’. Select your newly created STP and click Run.



After some processing the STP will create a HTML report that looks like this



The HTML file is stored in the location C:\Documents and Settings\<your username>\Local Settings\Temp with a filename starting with 'hpf' – for instance 'hpf17586.html'. In case the STP does not work as expected you can access the log file

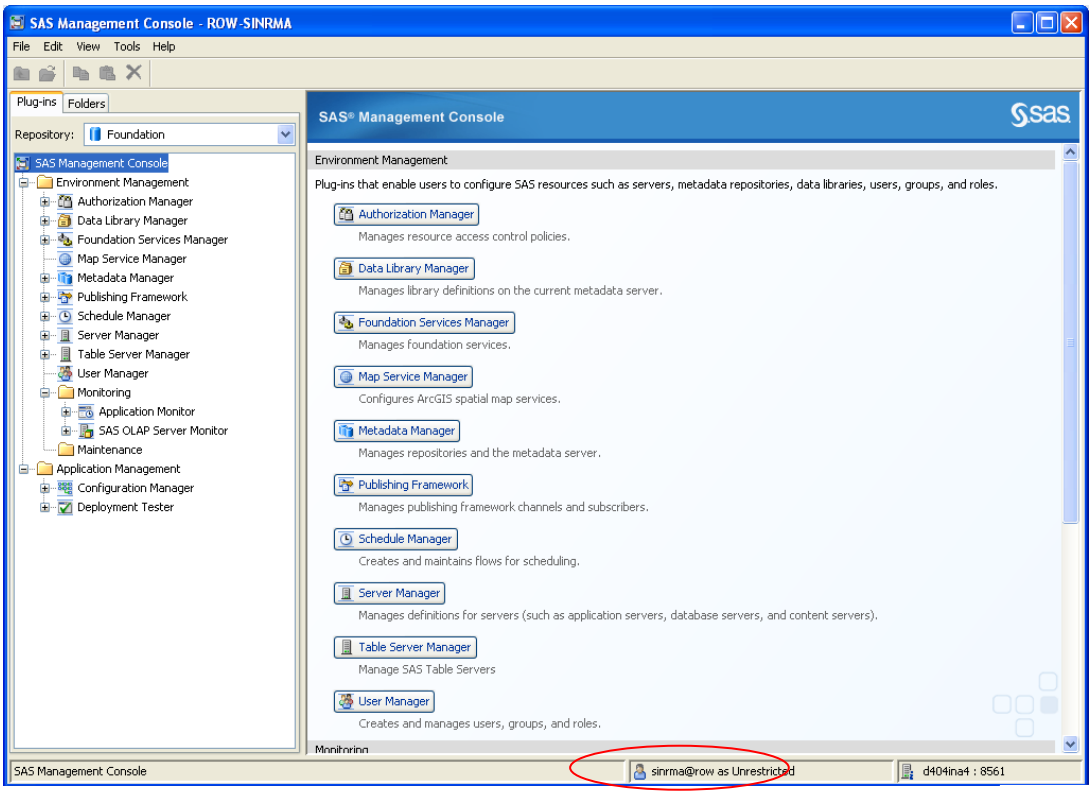
stored in the same location with the same filename as the report extended with '-log' – for instance 'hpf17586-log.html'.

Test the Installation

Test the SAP Connection on SAS Server

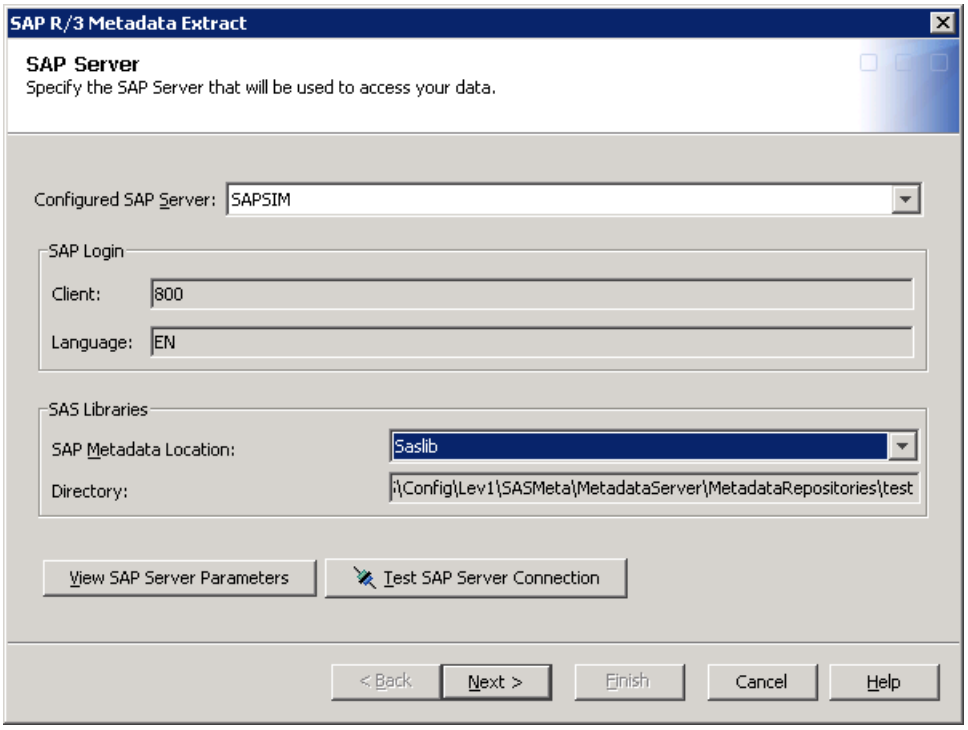
1. Open SAS Management Console with the connection profile of Non-Admin SAS User or any External User. Do not use sasadm connection profile (Figure 29).

Figure 29. SAS Management Console – Non-Admin SAS User



2. Select **Tools▶Extract From R3**. The SAP R/3 Metadata Extract dialog box opens (Figure 30).

Figure 30. SAP R/3 Metadata Extract



3. In the **Configured SAP Server** field, select the name of the SAP server that you defined in SAS Management Console.

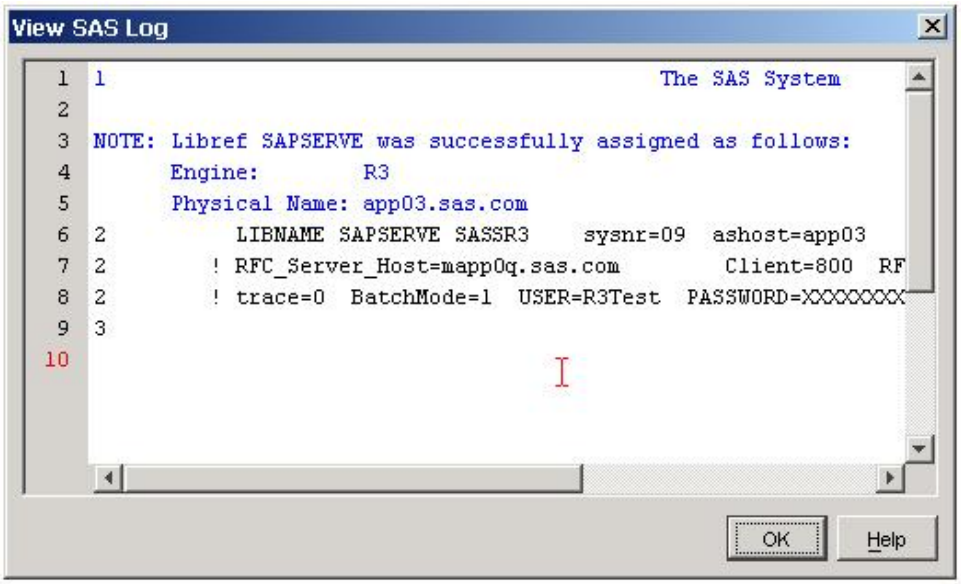
4. Click **Test SAP Server Connection**. If the connection is successful, then the following message is displayed (Figure 31):

Figure 31. Connection Successful

Note: If the connection is not successful, the SAS log indicates the problem. For example, RFC server errors might indicate that the RFC server is not running, or an invalid user ID might indicate that the password is incorrect. For more information about troubleshooting connection problems, see the SAS/ACCESS Interface to R/3 installation documentation that is included in your installation package.

5. To view the SAS log, click **Yes**. The View SAS Log dialog box opens and displays the LIBNAME statement that is generated using the specified parameters (Figure 32).

Figure 32. View SAS Log



Click **OK** to exit the SAS log.

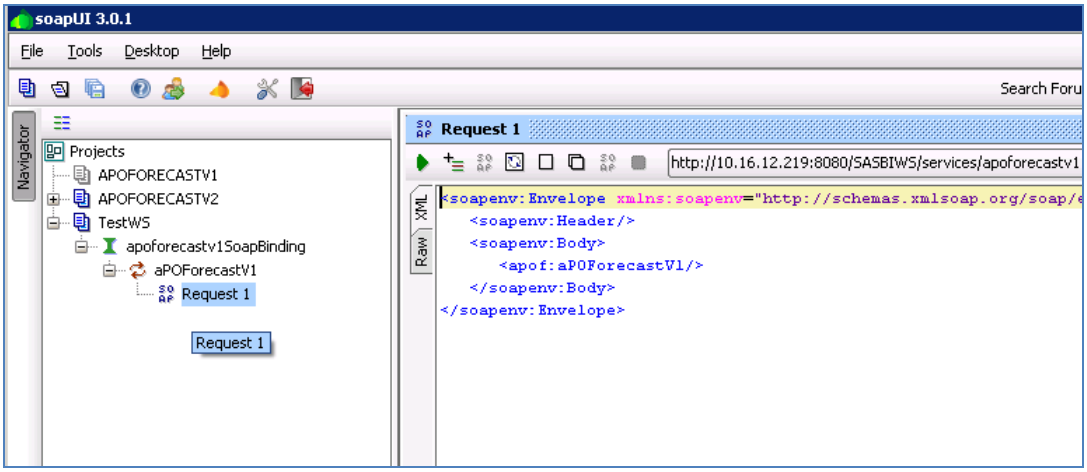
6. In the SAP R/3 Metadata Extract dialog box, click **Cancel**.

Test the SAS Forecasting Web Service on SAS Server system

You can the SAS Forecasting Web Service on SAS Server using any Open source Web Service Sofware (eg: soapUI. http://www.soapui.org/)

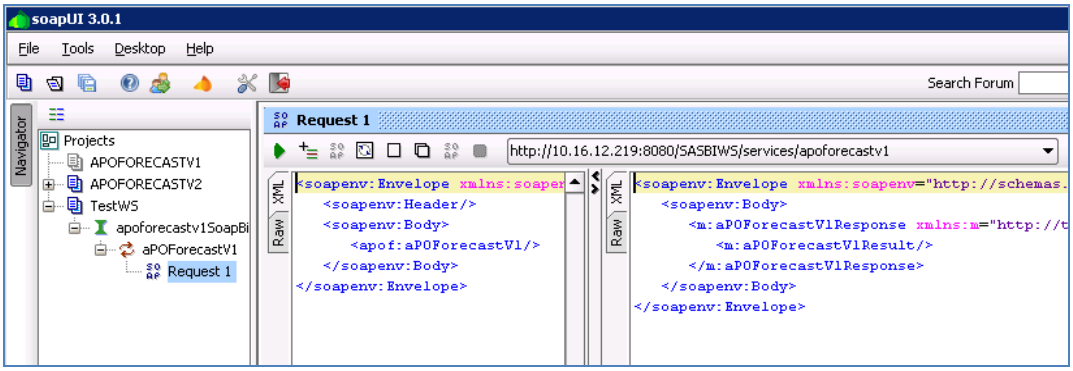
1. Open the soapUI application.
2. Create a project using the WSDL file used for the SAS Forecasting Web service as shown below (Figure 33).

Figure 33. SOAPUI



2. Execute the Web service by pressing the button 
3. The response of the Web service as shown below on the right hand side pane. If there are no any error messages, the SAS Web Server is running fine (Figure 34).

Figure 34. SOAPUI – Web Service run without errors



Test the SAS Forecasting Web Service from the SAP SCM System

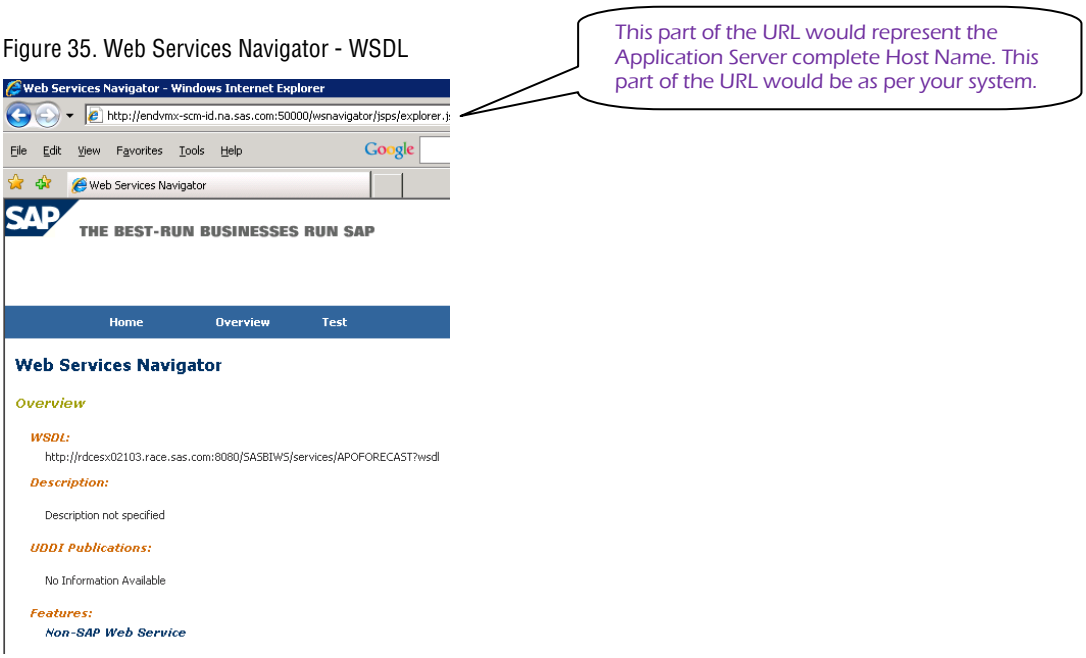
1. Login to the SAP Web service Navigator

   Typical path of the SAP WS Navigator would be given as below.

   "http://endvmx-scm-id.na.sas.com:50000/wsnavigator/enterwsdl.html"

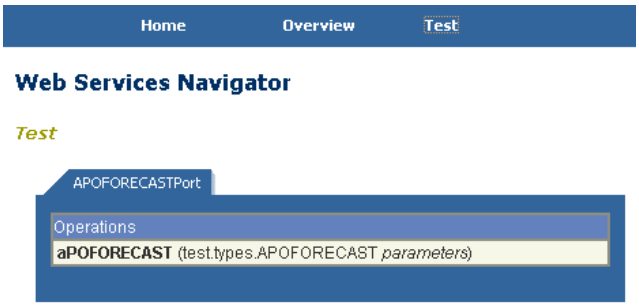
2. Enter the WSDL path and proceed further as shown below (Figure 35).

Figure 35. Web Services Navigator - WSDL



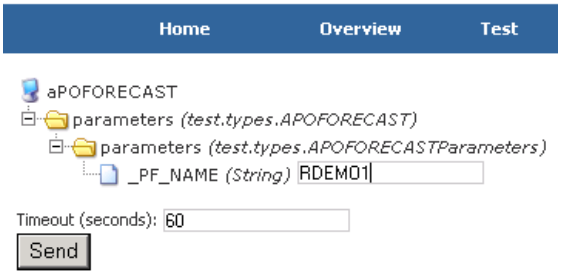
3. Click Test and click on the Web Service (Figure 36).

Figure 36. Web Services Navigator - Test



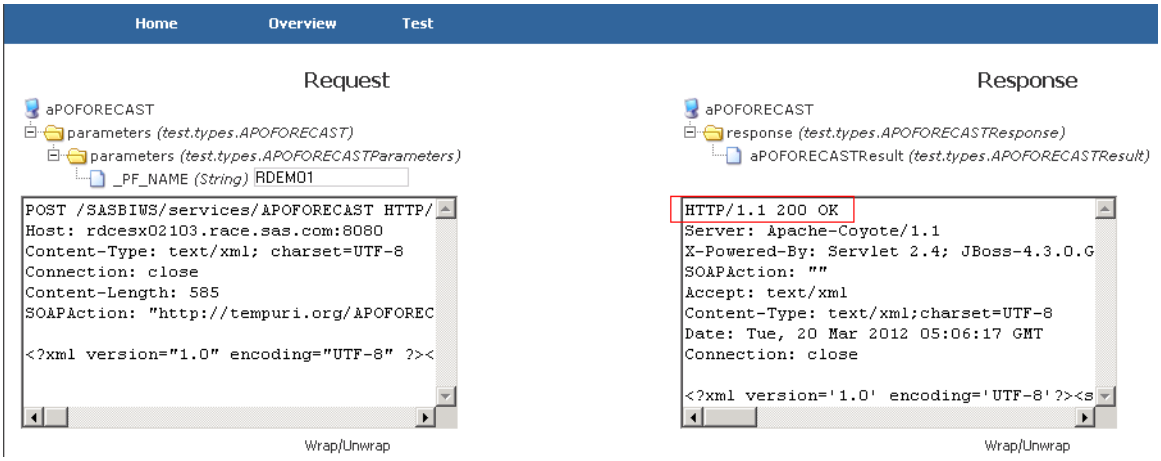
4. Press Send button, which will trigger the SAS Forecasting web service (Figure 37).

Figure 37. Web Services Navigator - Send



5. The result is displayed by returning OK code. The status “OK” denotes that SAS Forecasting Web service is ready to process the request from SAP SCM System (Figure 38).

Figure 38. Web Services Navigator – Return Code



The above tests confirm the successful installation and configuration.

In order to trigger the SAS Forecasting from the SAP APO Interactive Demand Planning

Transaction, you need to maintain the SAS Forecasting Profile in SAP APO system. Hence create at least one active profile in the APO system before running the SAS Forecast.

Please refer to the SAS Forecasting Add-in User Guide for steps to create SAS Forecasting Profile.

Please contact our SAS Representative for any other issues.

APPENDIX 1

Installation and Configuration Worksheets

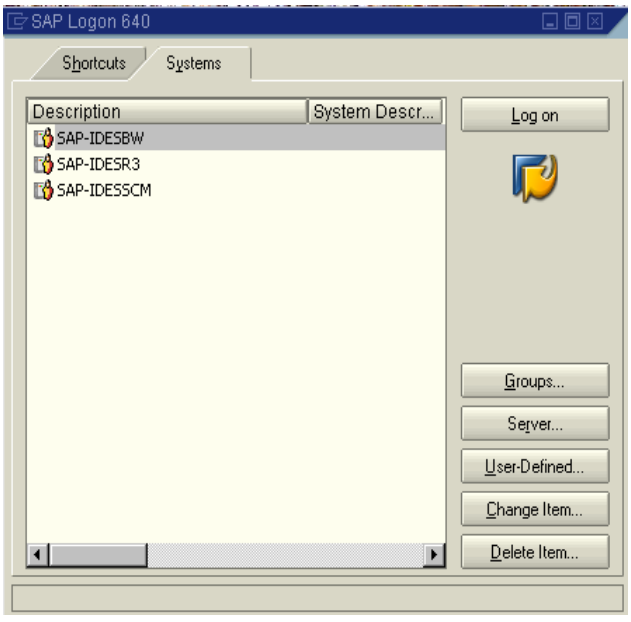
SAP System Worksheet

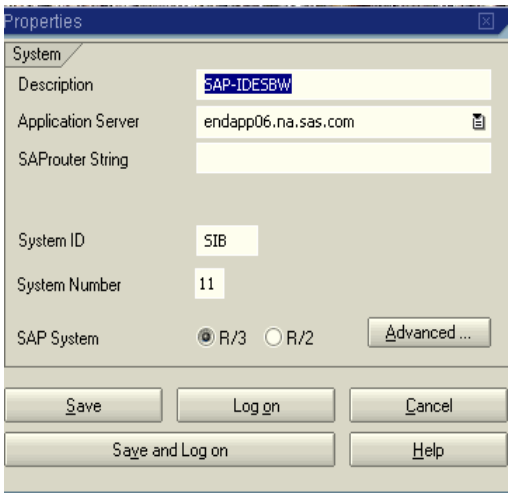
Provide details about the SAP systems that will be connected to SAS.

(One worksheet for each SAP System)

1. **SAP System Name:** _____
2. **SAP System Description:** _____
3. **Application Server:** _____
4. **System ID:** ____ 5. **System Number:** ____ 6. **Client Number:** ____

Note: Some of the key SAP information can be obtained from SAP GUI (Select Change Item button for properties).





7. **IP Address:** _____
8. **Release Level of SAP SCM:** _____ _____
9. **SAP Kernel Release:** _____
10. **SAP Maintenance Release:** _____

11. **Release Level of SAP GUI:** _____

12. **Is this a UNICODE system?** ____ Yes _____ NO
13. **System Usage (check which applies):** ___Development ___Test ___Production
14. **Hardware Platform:** _____ 15. **Operating System:**_____
16. **Enable Batch Processing:** _____Yes _____ No
17. **Destination group name (for SAS):** _____
18. **Transport Files imported to SAP system** (check if completed) - :
    a) **SAS Data Surveyor for SAP Transport Files (1 SET REQUIRED)**

    For SAP SCM Systems prior to SAP NetWeaver 7.0 (Kernel 6.40 or lower):
    ___ SAPKA93120INSAS** (for all SAP Systems to be accessed by SAS)
    ___ SAPKB92020INSAS (SAP BW Data Access)
    ___ SAPKA93022INSAS (for all SAP Systems to be accessed by SAS)
    For SAP SCM Systems prior to SAP NetWeaver 7.0 and higher:
    ___ SAPKA93130INSAS** (for all SAP Systems to be accessed by SAS)
    ___ SAPKB93030INSAS (SAP BW Data Access)
    ___ SAPKA93032INSAS (for all SAP Systems to be accessed by SAS)

    b) **SAS Forecasting for SAP APO "add-in" (pick 1 of the following)**
    ___ SAPKF92929INSAS (SAP SCM 5.0 and above)
    ___ SAPKF92030INSAS (SAP SCM version is lower than SCM 5.0)

    Optional: Use if SAP GUI Status is to be modified with SAS on menu bar
    ___ SAPKF92011INSAS

**Must be installed first

19. **SAP USERID** with appropriate access to the following transactions
    SAP USERID: _____
    SAP Password: _____

    Transport Management System

    ___ STMS (SAP Transport Management System)

    ABAP Functions and Programs:

    ___ SE37 (Function Builder – to test BAPIs)

    ___ SE38 (ABAP Editor)

    ___ SE80 (ABAP Development Workbench)

    ___ lpconfig (Display/Create Logical Port)

    ___ SE11 (ABAP Dictionary)

    View Tables and Table Maintenance

    ___SE16 (Display a table)

    ___ SE30 (Maintain Tables)

    ___SE31 (Maintain Tables)

    ___ SE13 (Dictionary: Technical Settings)

Job Maintenance

___SM37 (Can be used to display the job status)

RFC Destinations

___ SM59 (Configuration of RFC Destination)

Web Service Debugging

___ SMICM
This transaction is required to view the parameters values(eg: Time Out, Keep Live connection Parameters) for the Internet communication Manager

___ RZ10
This transaction is required to view the parameter values for the complete APO System.

___ SXMB_ADM
This transaction is required to understand the ICM_HTTP_TIMEOUT Parameter.

___ SICF (Maintain Services ….or the following links …)

SAP Netweaver Web Transactions

This part of the URL would represent the Application Server complete Host Name. This part of the URL would be as per your system.

- Webservices Navigator :
  The link can be "http://endvmx-scm-id.na.sas.com:50000/wsnavigator/enterwsdl.html"
- SOA Manager
  The link can be "http://endvmx-scm-id:8000/sap/bc/webdynpro/sap/appl_soap_management?sap-client=800&sap-language=EN"

We cannot trouble-shoot the Web Services on the SAP Side unless we have access to the above transactions/links.

If the above links are working then we need not access to SICF.

Authorizations, Profiles, and Users (not required – but sometimes helpful)

___ SU01 (Maintain Users)

___SU03 (Maintain Profiles)

__PFCG (Maintain Authorizations – previously SU03)

20. **SAP Server ID (Windows/Unix ID):** _____
(Password): _____

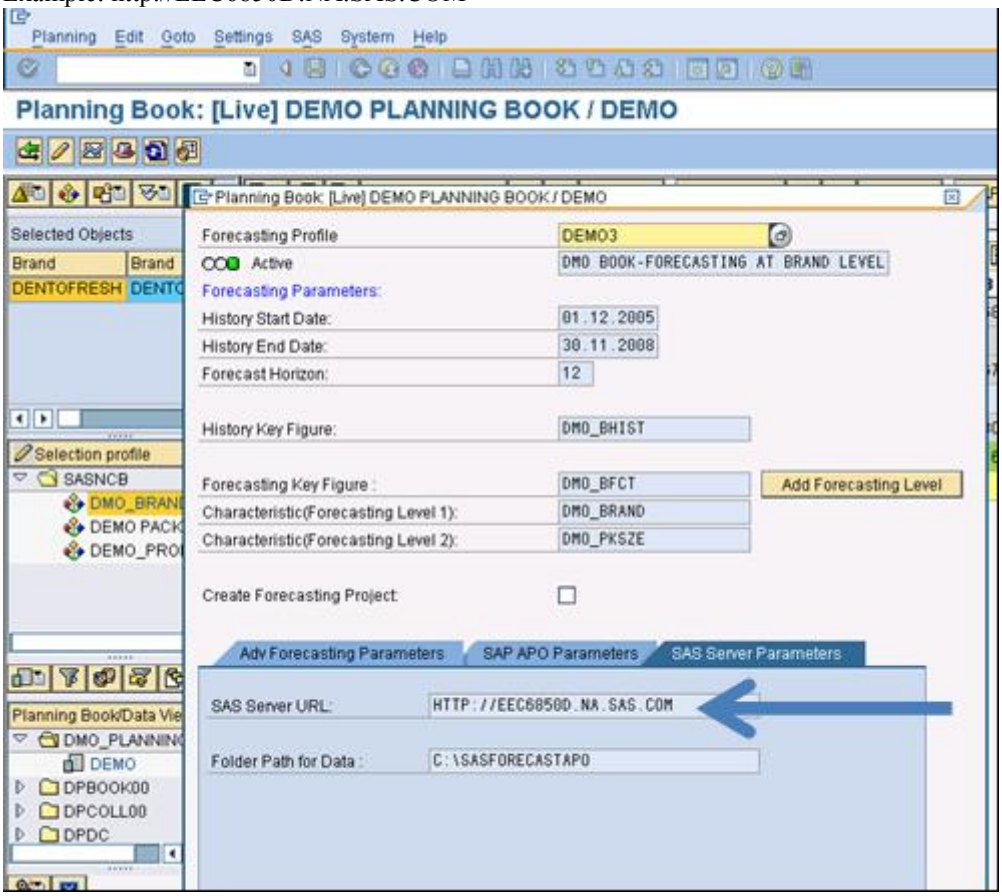
SAS Environment – Worksheet

(Suggest replacing Example screen shots with actual system screen shots)

1. **SAS IP Address:** _____

2. **SAS Server URL:** _____

   Example: http://EEC6850D.NA.SAS.COM



3. **SAS USERIDs** (complete for each userid setup/available):

   - **SASADM@saspw**

     Password: _____

   - **SASADM**

     Password: _____

   - **SASdemo**

     Password: _____

   - **Additional SAS USERID:** _____

     Password: _____

   - **Forecast Studio USERID**:_____

     Password: _____

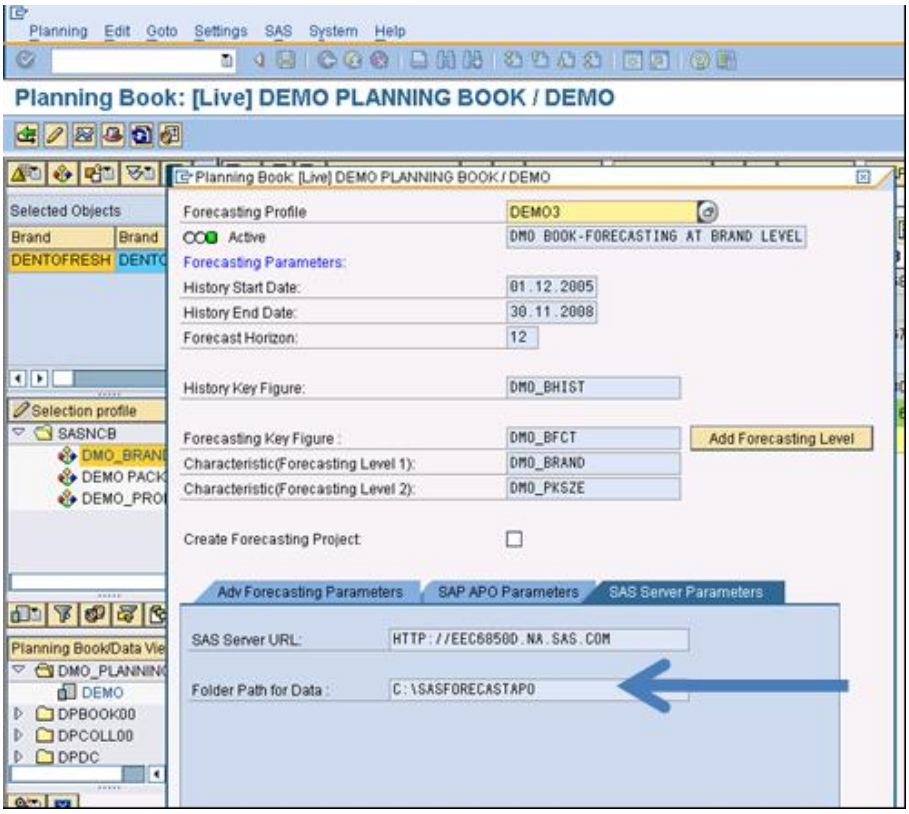
4. **Copy of SAS Installation Disks (**Directory - SAS Software files download / copy location):

   _____

5. Directories/Folders for SAS Items

Location for Work Files (data files and stored process):

Example: C:\SASFORECASTAPO



6. Web Service/ Stored Process Details:

   a. Name of Stored Process: _____

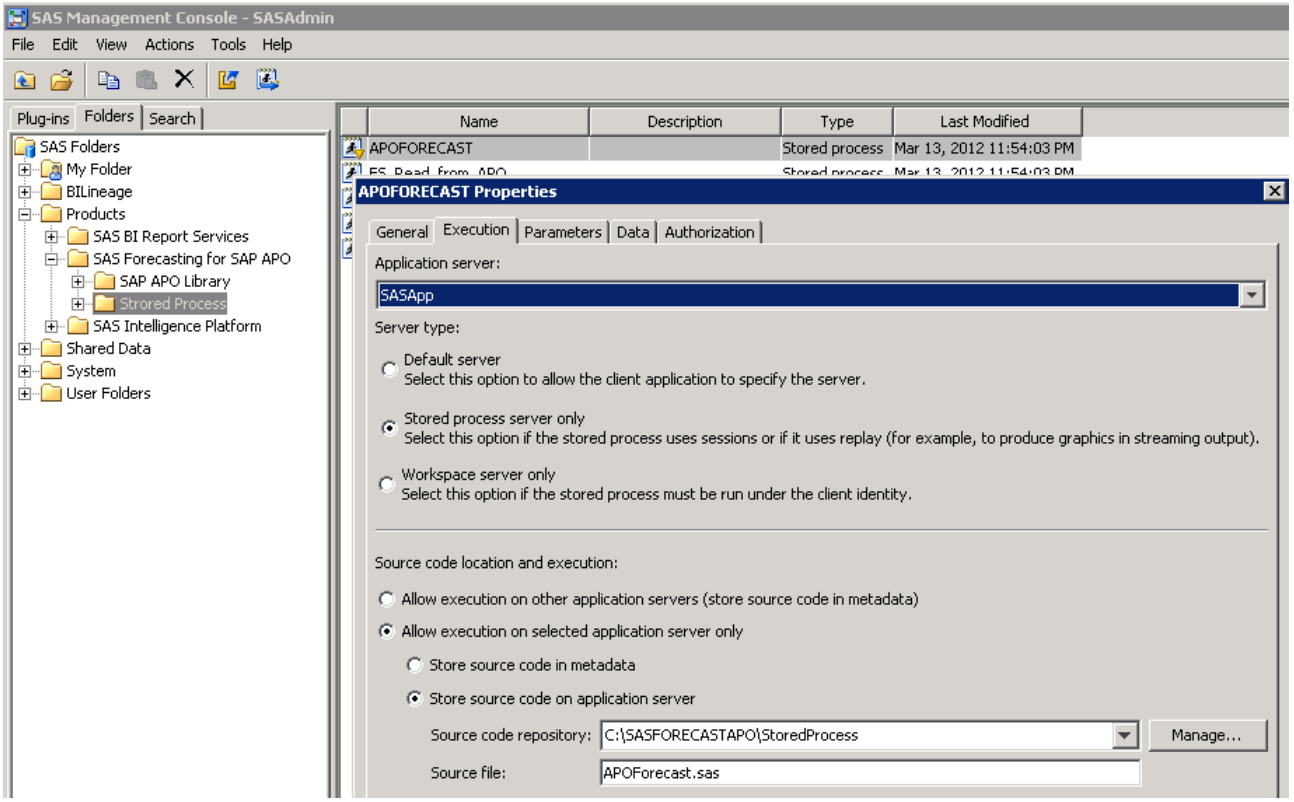
   b. Name/Location of SAS Program:

      Location: _____

      Program Name: _____

Example

- Stored Process: APOFORECAST
- Location SAS Program: C:\SASFORECASTAPO\StoredProcess
- Program Name: APOForecast.sas
- Web Service: APOFORECAST



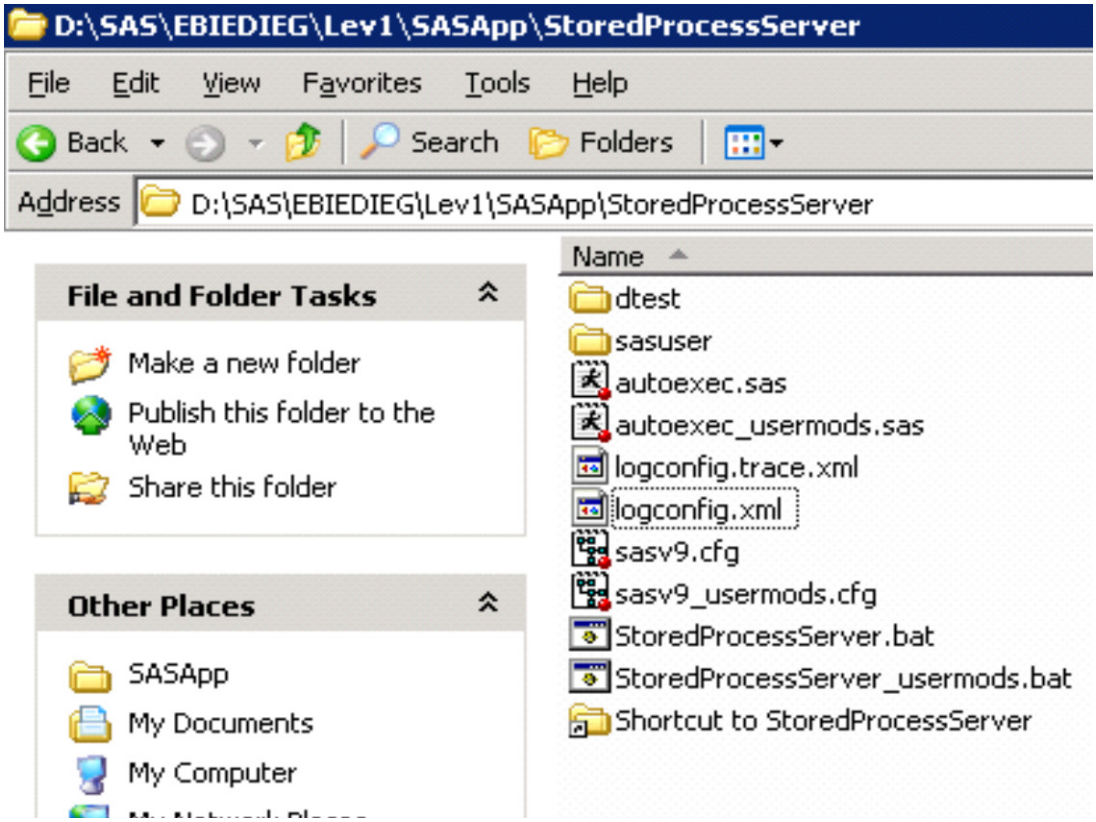
   c. Name / Location of Stored Process Server "log"

      Name: _____

      Location (Directory): _____

Is there a log called SASAPP_STPServer_2009-08-XX_6000.log (the actual file name will have the date it was created in the name – but will start with the SAP_APP_STVServer) in directory \sas\EBIEDIEG\Lev1\SASAPP\StoredProcessServer

This is the typical location for the log – my system was configured to store the log in a separate directory -- if the log is not in the directory show below – please open logconfig.xml .



This statement in logconfig.xml will tell us where it is stored:

```
<!-- Rolling log file with default rollover of midnight -->
   <appender class="RollingFileAppender" name="TimeBasedRollingFile">
      <param name="Append" value="true"/>
      <param name="ImmediateFlush" value="true"/>
      <rollingPolicy class="TimeBasedRollingPolicy">
         <param name="fileNamePattern"
value="D:\SAS\EBIEDIEG\Lev1\Logs\SASApp_STPServer_%d_%S{pid}.log"/>
```

While in this file – please check that debug is specified in this line:

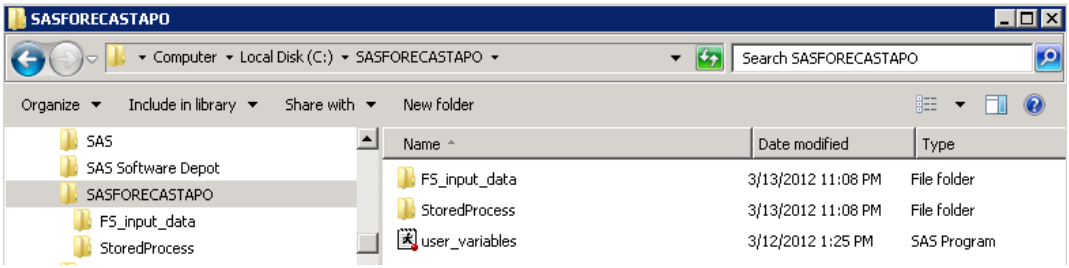
```
<!-- Application message loggers -->
   <logger name="App">
      <level value="Debug"/>
         </logger>
```

7. Libname statement for SAP system:

Example:

libname SAPSCM SASIOSR3 sysnr=**00** ashost="170.251.70.243" BatchMode=**1** destgroup=SAS1 trace=**0** language=EN Client=**001** USER=capellj password="jzapata1" ;

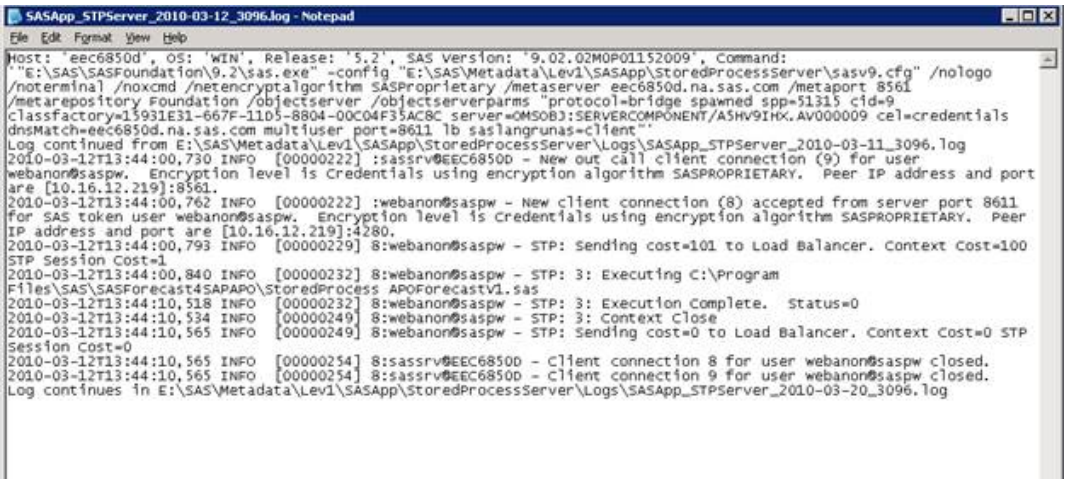
Open user_variables.sas to get the libname details:



8. Attach copies of the following:

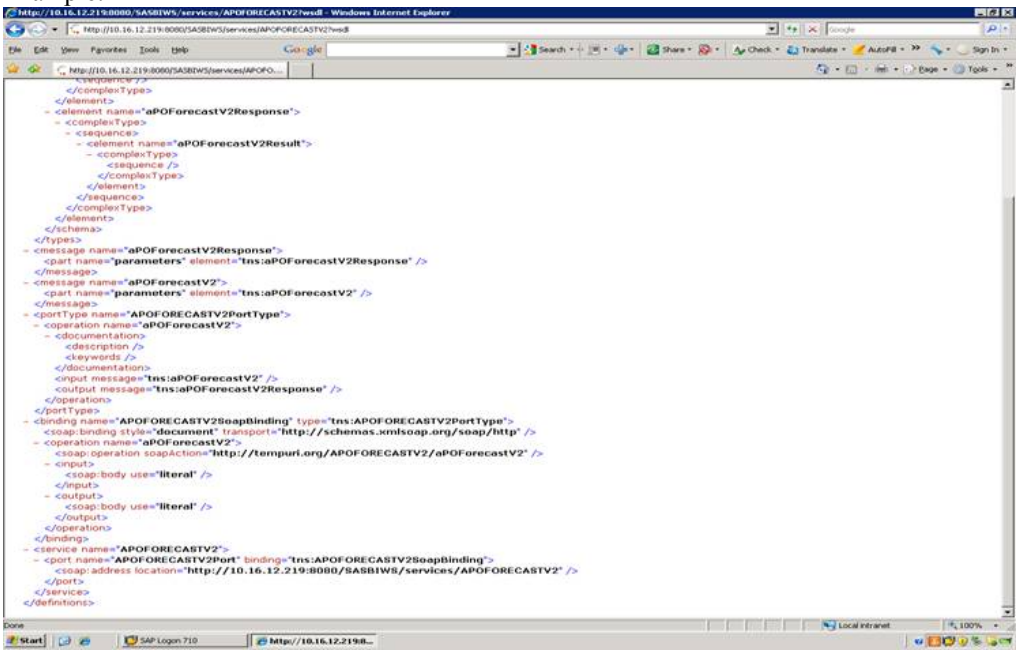
a. Stored Process Server log (successful execution)

Example:



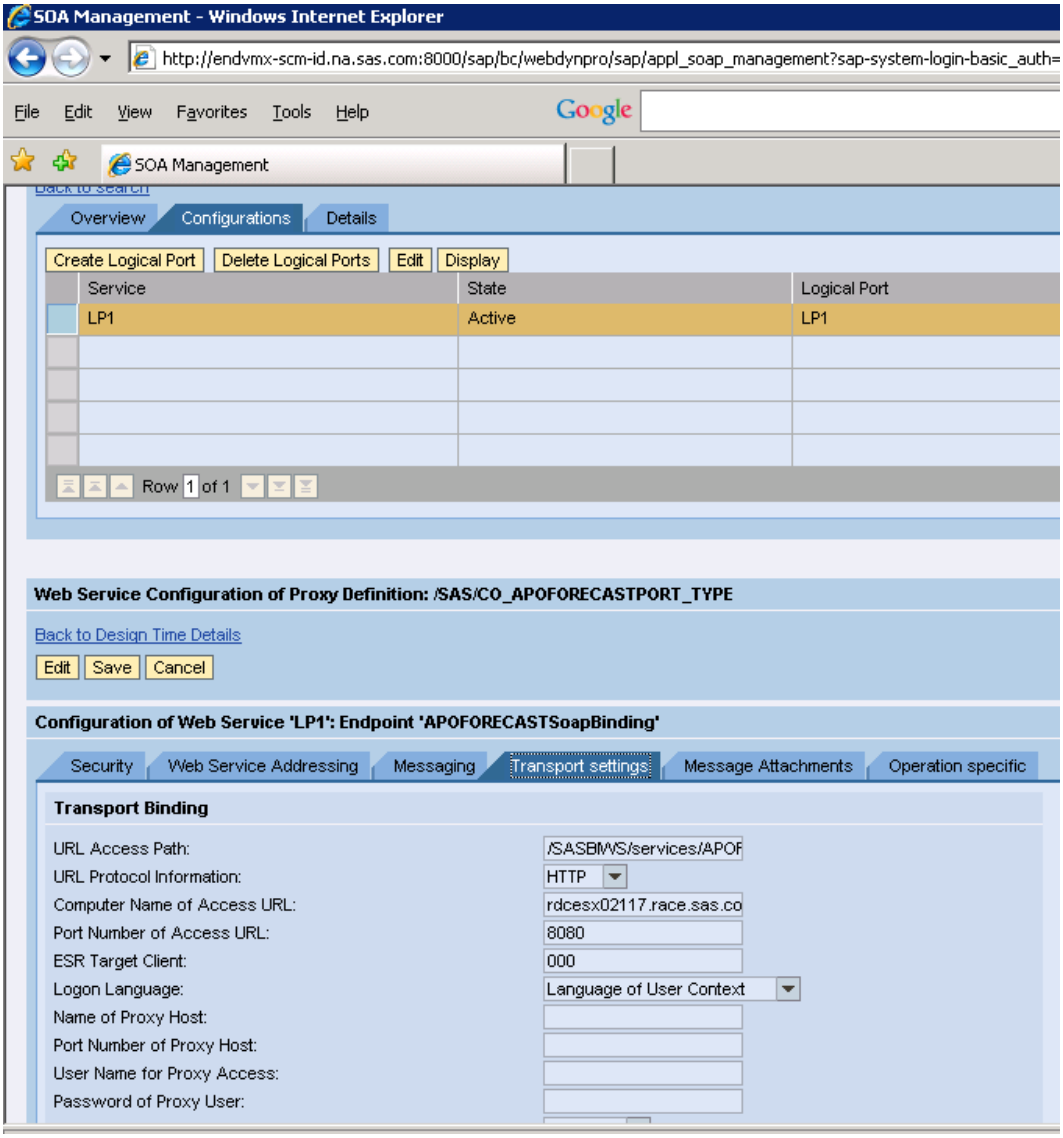
b. Copy of WSDL file (update IP address with your SAS Server address):
http://170.251.74.34:7801/SASBIWS/services/APOFORECAST.wsdl

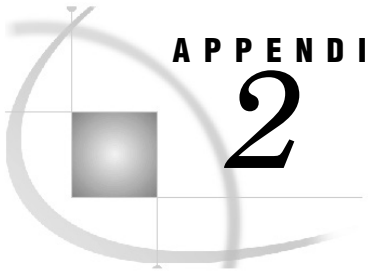
Example:



c. Screen Shot of the ipconfig / SOAMANAGER information (showing your Proxy Class, Logical Port and URL)

Example:


SOA Management - Windows Internet Explorer
http://endvmx-scm-id.na.sas.com:8000/sap/bc/webdynpro/sap/appl_soap_management?sap-system-login-basic_auth=
File Edit View Favorites Tools Help
Google
SOA Management
Overview
Configurations
Details
Create Logical Port
Delete Logical Ports
Edit
Display
Service
State
Logical Port
LP1
Active
LP1
Row 1 of 1
Web Service Configuration of Proxy Definition: /SAS/CO_APOFORECASTPORT_TYPE
Back to Design Time Details
Edit
Save
Cancel
Configuration of Web Service 'LP1': Endpoint 'APOFORECASTSoapBinding'
Security
Web Service Addressing
Messaging
Transport settings
Message Attachments
Operation specific
Transport Binding
URL Access Path:
/SASBIWS/services/APOF
URL Protocol Information:
HTTP
Computer Name of Access URL:
rdcesx02117.race.sas.co
Port Number of Access URL:
8080
ESR Target Client:
000
Logon Language:
Language of User Context
Name of Proxy Host:
Port Number of Proxy Host:
User Name for Proxy Access:
Password of Proxy User:



APPENDIX 2

Installation Checklist

Activity	Completed	Reference
Installation Worksheets Completed		Appendix I
SCM System(s) Installed and Configured		
SAP APO Test Planning Book Loaded and Configured		
Weblogic/JBOSS/Websphere Installed and Configured		
Weblogic/JBOSS/Websphere Activated (ability to run simple web service from SAP on separate server successfully tested)		
SOAPUI Installed on SAS Server (optional – for testing web service)		
SAP GUI Installed on SAS Server		
SAS Prerequisite on SAS Server		Chapter 2
Data Surveyor for SAP Configured		Post Installation Instructions for SAS/Access 4.3 Interface to R/3
- Validate Data Surveyor for SAP Transport files imported to SCM system		
- Validated SAP RFC Authorizations		
- Maintain RFC Destinations		
- Maintain /SAS/DESTS table		
SAS Management Console Configurations Completed		
- Server Definition		
- User Definitions		
- Library Definitions		
Validated Connection working from SAS to SAP SCM system (with SAS Libname statement)		
SAS Forecasting for SAP APO Transport Files Imported to SCM System		Chapter 3
Activate BAD1 on SCM System		Chapter 4
Set up Logical Port for Acessing the SAS Web Service on SAP SCM		Chapter 4
Create and Save Forecast Profile in SAP APO Planning Book		User Guide
Import .spk file to SAS Management Console		Chapter 3

Activity	Completed	Reference
Validated Web Service "APOFORECAST" deployed as Web Service on SAS Server		Chapter 3
Create / Validate SMC Configurations on SAS Server		
- User / User Group Definitions		Chapter 4
- SAP Server Definitions		Chapter 4
- Library Definitions		Chapter 4
Create windows directories on SAS Server (for Libname statements)		Chapter 4
Create windows directories on SAS Server (for dirpath statement)		Chapter 4
Update Libname Statements in Stored Process on SAS Server		Chapter 4
Update dirpath Statement in Stored Process on SAS Server		Chapter 4
Extract Metadata from SCM System to SAS Server		Chapter 4
Test Web Server using SOAP UI		Chapter 4
Test Web Service from the SAP SCM System		Chapter 4